

Clostridium Difficile

Clostridium difficile infections are not classified as reportable in Louisiana.

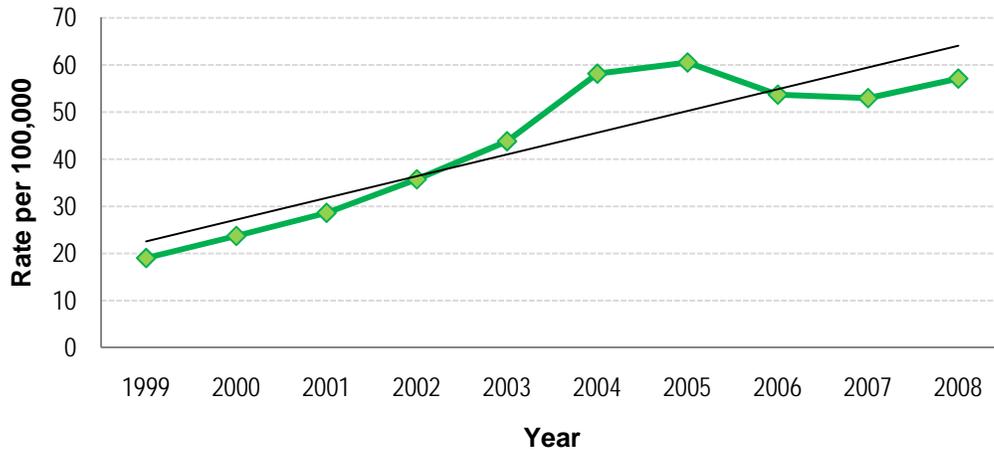
C. difficile is a spore forming, gram positive anaerobic bacteria that produces two endotoxins: toxin A and toxin B. It is a common cause of diarrhea and can cause more serious intestinal conditions such as pseudomembranous colitis, toxic megacolon, perforations of the colon, sepsis and even death. Symptoms include watery diarrhea, fever, loss of appetite, nausea and abdominal pain and tenderness. *C. difficile* infections (CDI) is responsible for 30% to 40% of hospital-onset diarrhea (Department of Health and Human Services and CDC, 2009), 20% to 30% were community acquired CDI (Preeta K. Kutty, 2010), and 15% to 20% of recurrence CDI. (K.W. Garey, 2008) Risk factors for CDI include antibiotics, gastrointestinal surgery/manipulation, long length of stay in healthcare settings, a serious underlying illness, immunocompromised and advanced age (>65 years). Some people are colonized with *C. difficile* but do not have CDI. Colonization is when a person tests positive for *C. difficile* but exhibits no clinical symptoms. (CDC, 2005)

C. difficile is shed in feces and spread via fecal-oral transmission. Common dissemination include: contaminated surface, device, material, or person who comes into contact with the *C. difficile* spores.

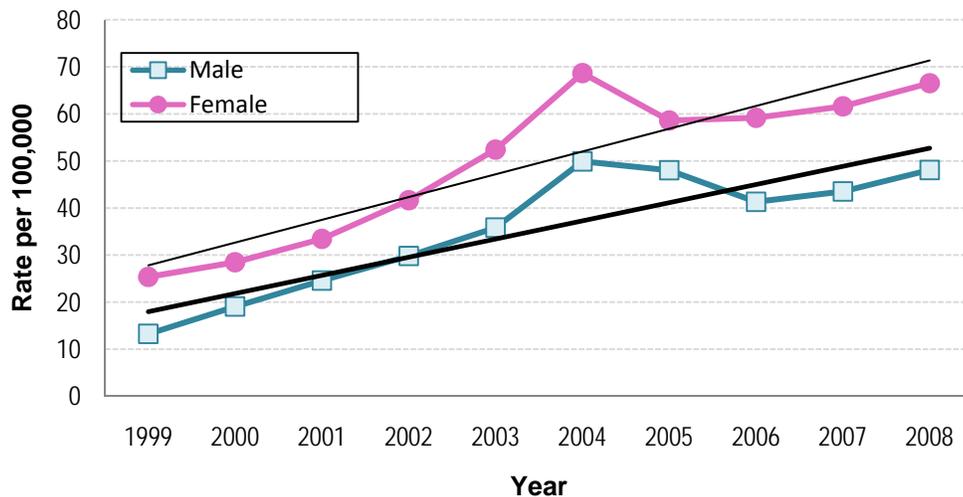
CDI is mainly a healthcare associated illness (80%), but community acquired CDI (20%) are also of concern. (Center for Disease Control and Prevention, 2010) (Preeta K. Kutty, 2010) In the past ten years there have been increased rates of CDI. Additionally the cases of CDI have been more severe and an associated increase in mortality nationwide. In 2004 there was a new epidemic strain of *C. difficile* identified causing hospital outbreaks in several states. The new strain is more virulent, with an ability to produce large quantities of toxins A and B and is more resistant to fluoroquinolones antibiotics. (Center for Disease Control and Prevention, 2010)

***Clostridium difficile* Infections in Louisiana**

There were a total of 19,174 cases of *C. difficile* in hospitalized patients in Louisiana between 1999 and 2008, ranging from 800 to 2,500 a year. The number of cases increased from 1999 to 2005, declined in 2006 to 2007 and has returned to its previous peak in 2008. The initial increase from 1999 to 2005 could reflect increased testing and reporting of cases or could represent an actual increase in incidence. The decline in cases in 2006 and 2007 possibly reflects a reduced population size and overall hospital admissions in Louisiana after the 2005 Katrina Hurricane. The increase in cases in 2008 could reflect the population returning back to its baseline before the hurricane. (Figure 1)

Figure 1. *C. difficile* diagnoses among hospitalized patients - Louisiana, 1999-2008

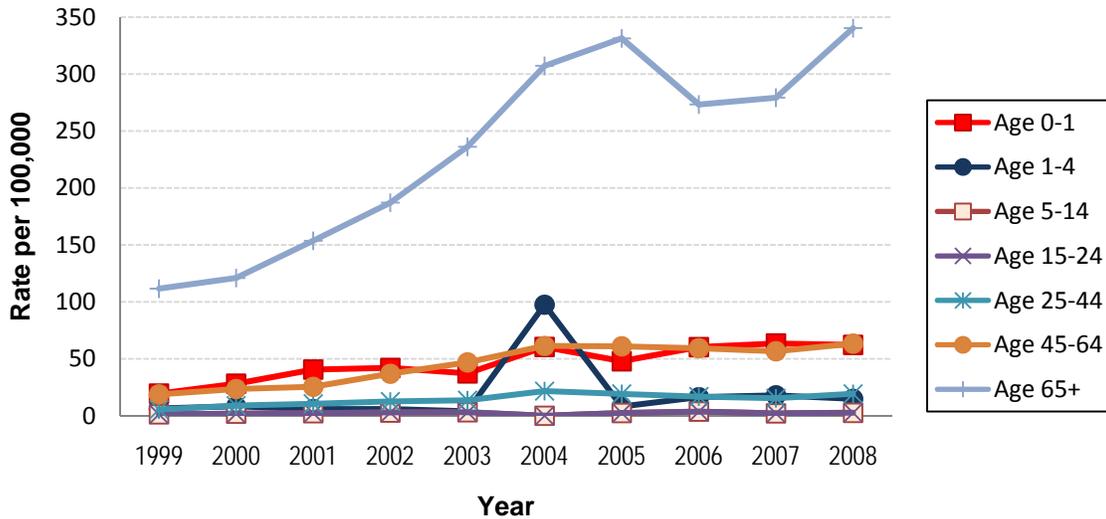
The rate of *C. difficile* infections per 100,000 also shows the same trends. Rates among hospitalized female patients are slightly greater than for male patients, yet both groups experienced similar patterns from 1999 to 2008. (Figure 2)

Figure 2. *C. difficile* diagnoses rates among hospitalized patients by sex - Louisiana, 1999-2008

The rate of *C. difficile* infections in different age groups per 100,000 population shows a large disparity between the elderly (65+ years) compared to the rest of the population, followed by the infants (0-1 year), and the second oldest group (45-64 years). The lowest rates were in the 5 to 14 year and 15 to 24 year age groups. The elderly rates were five times greater than the second and third highest groups and two hundred and fifty times greater than the lowest groups. This indicates that the elderly are at great risk of contracting *C. difficile* while hospitalized followed

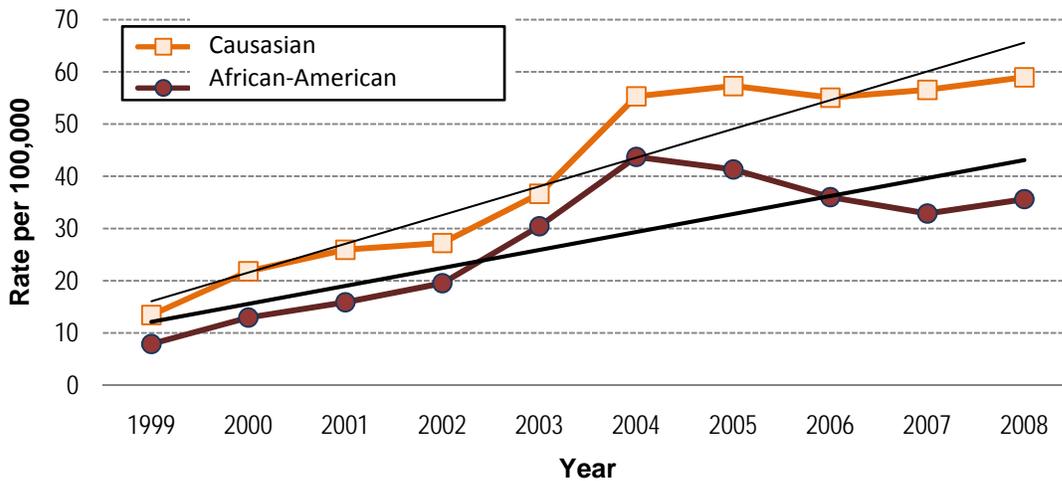
by age groups newborn to 1 year and 45 to 64 year, respectively. Furthermore, adolescent and young adults are at least risk. The spike seen in 2004 among the 1 to 4 year age group is most probably a coding error since there were no cases reported in the 5 to 14 year age group; an event not seen elsewhere in the data. (Figure 3)

Figure 3. *C. difficile* diagnoses rates among hospitalized patients by age - Louisiana, 1999-2008



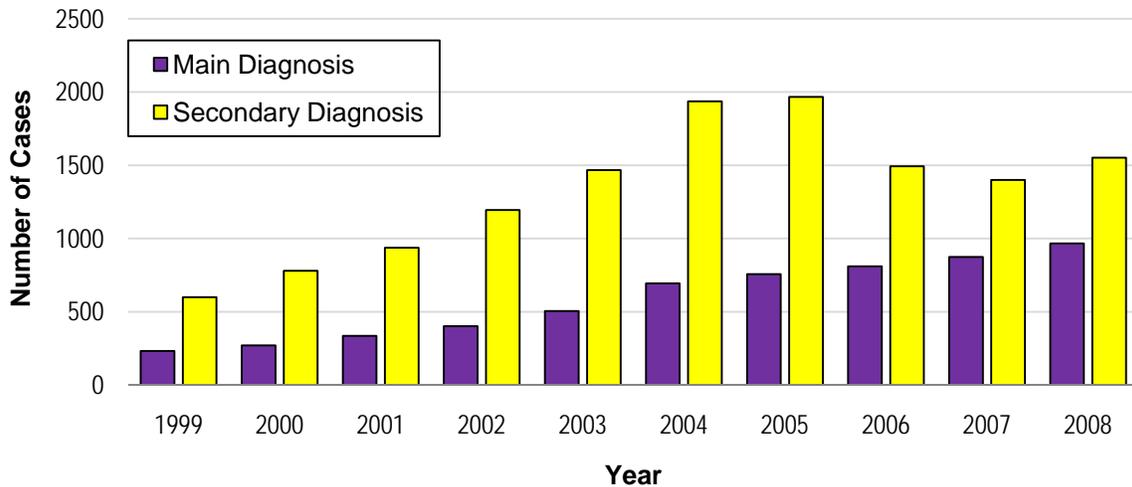
Incidence rates of *C. difficile* among hospitalized patients categorized by races had smaller differences between Caucasians and African-Americans. Caucasians had 1.5 times more *C. difficile* infections compared to African-Americans between 1999 and 2008, per 100,000 population. (Figure 4)

Figure 4. *C. difficile* hospitalizations by race - Louisiana, 1999-2008



During the 1999 to 2008 period, 20% of all *C. difficile*-associated hospitalizations were patients with *C. difficile* infection as their main diagnosis. This is a decrease from last year where 30% of the patients with *C. difficile* as their main diagnosis. The number of *C. difficile* cases as main diagnosis steadily increased from 1999 to 2008 while the number of *C. difficile* cases with a secondary diagnosis declined in 2005 and 2006 but began rose again in 2008. (Figure 5)

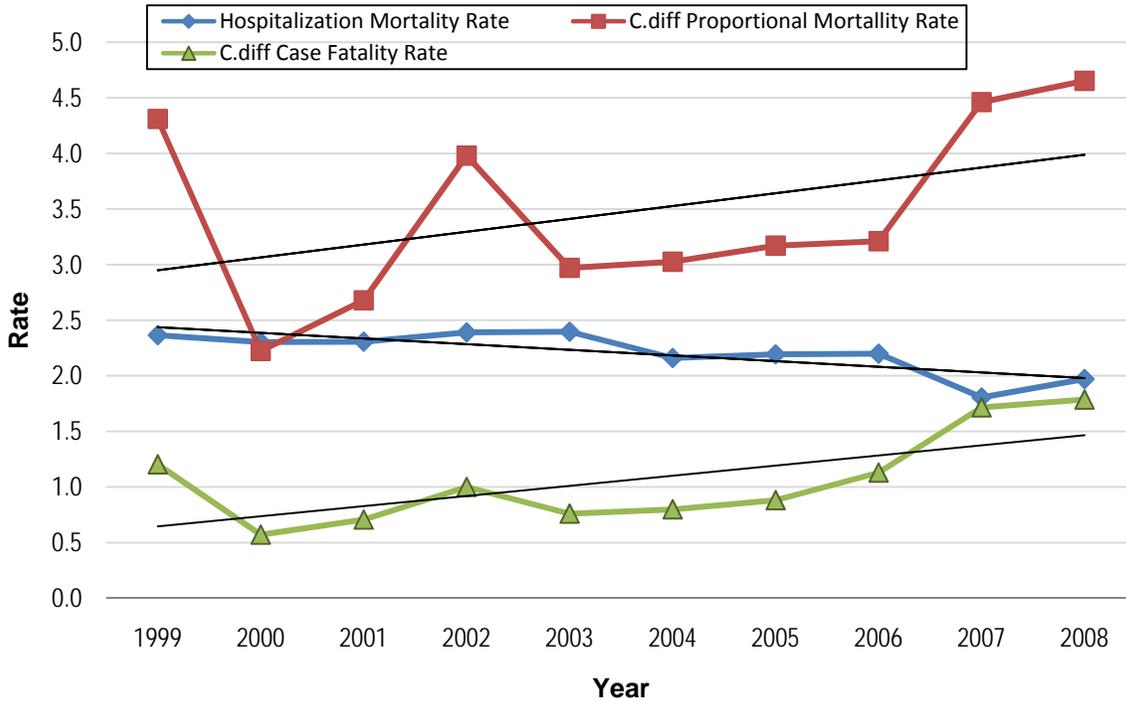
Figure 5. Hospitalized patients with *C. difficile* as main diagnosis and secondary diagnosis - Louisiana, 1999-2008



Clostridium difficile-Associated Deaths

From 1999 through 2008, the average mortality rate from hospitalization in Louisiana was 2%. The average proportional mortality and case fatality rates for *C. difficile* during the same time interval was 3.6% and 1.1%, respectively. Noteworthy, in the past ten years hospital mortality rates have declined and *C. difficile* mortality rates have risen with a 40% difference from 1999 to 2008. *C. difficile* mortality and case fatality have parallel rates over the past ten years. (Figure 6)

Figure 6. Mortality Rates: All hospitalization compared to *C. difficile* and *C. difficile* case fatality rate Louisiana, 1999-2008



Prevention

C. difficile is transmitted by persons touching items or surfaces that are contaminated with *C. difficile* feces and then touching their mouths or other mucus membranes. Healthcare workers are at greater risk of spreading *C. difficile* if they do not wash their hands in-between touching contaminated objects or individuals and then touching other objects or people. *C. difficile* is not killed by alcohol based hand sanitizer so strict hand washing with soap and water adherence is imperative to reduce the risk of transmission. Additionally, clean surfaces of commonly used areas (bathrooms, kitchens, etc.) on a regular basis with household detergents/disinfectants.