

Cryptococcosis

Cryptococcosis is a Class C reportable disease in Louisiana as an AIDS defining illness. It should be reported within five (5) business days

Epidemiology

Cryptococcosis is a fungal infection caused by encapsulated yeast of the genus *Cryptococcus*; most cases are caused by *Cryptococcus neoformans*.

The yeast is most commonly found in the debris around pigeon roosts, decaying wood and soil contaminated with pigeon or chicken droppings. *C. neoformans* grows to high concentrations in pigeon and other bird droppings; however the birds are not infected and do not excrete the fungus. Transmission results from the inhalation of aerosolized organisms. *Cryptococcus* infection may often lead to cryptococcal meningitis, the most serious form of the disease. Infection may also precipitate pulmonary manifestations, which include coughing and chest pain.

Because the organism is ubiquitous, it is presumed that exposure to *C. neoformans* is common. Skin test surveys of healthy subjects provide some support for this assumption. Nevertheless, natural resistance to infection must be high because new cases were relatively rare before the advent of acquired immunodeficiency syndrome (AIDS). Unlike other aerosol-borne mycoses, cases of cryptococcosis rarely occur in clusters.

Patients with immunologic defects in T-cell-mediated host defense mechanisms appear to be at increased risk for progressive cryptococcosis. Among AIDS patients in the United States, cryptococcosis is the defining illness in 5% of patients. The incidence of cryptococcosis is also increased in patients with lymphoreticular malignancies (especially Hodgkin's disease), as well as sarcoidosis (even in the absence of corticosteroid therapy).

Primary infection is acquired by inhalation of aerosolized fungal elements and often is inapparent or mild. Pulmonary disease is characterized by cough, hemoptysis, chest pain and constitutional symptoms. Chest radiographs may reveal a solitary nodule, focal or diffuse infiltrates.

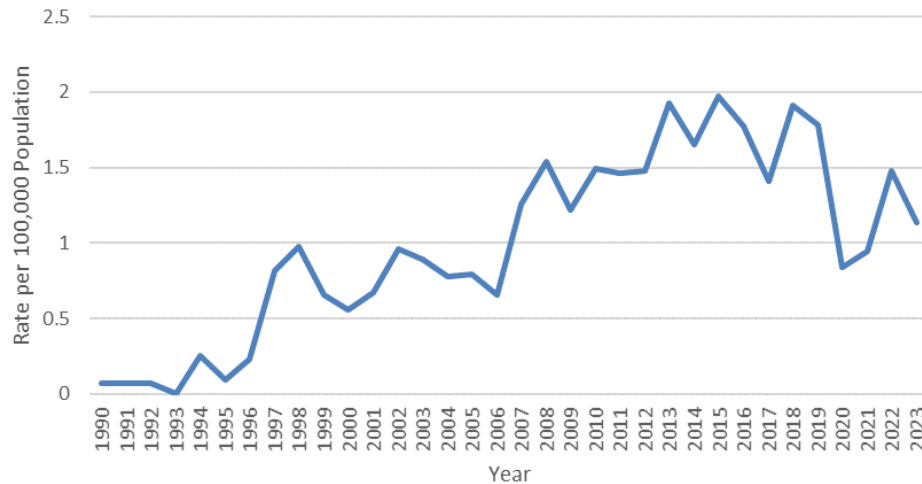
Invasive Disease

Hematogenous dissemination from the lungs to the central nervous system, bones, joints, skin, and mucous membranes can occur, but dissemination is rare in individuals without defects in cell-mediated immunity (eg, transplantation, malignant neoplasm, collagen-vascular disease, long-term corticosteroid administration, or sarcoidosis). Usually, several sites are infected, but manifestations of involvement of one site predominate. Cryptococcal meningitis is the most serious form of cryptococcal disease. Cryptococcal fungemia, without apparent organ involvement, occurs in patients with human immunodeficiency virus (HIV) infection. Most persons with disseminated cryptococcosis are also fungemic, however fungemia is rare in pediatric cases.

Incidence

Since 1990, there have been 1,541 reported cases of cryptococcosis in Louisiana; incidence rates began to increase significantly in the mid-90's. In 2020, the decline in cases likely reflects a lapse in surveillance, as public health efforts shifted towards COVID-19, rather than a true reflection of decreased case counts. Nevertheless, a downward trend in reported cases is still evident. In 2023, only 54 cases were reported, which is the lowest annual count reported since 2006 (Figure 1).

Figure 1: Rates of *Cryptococcosis* per 100,000 Population – Louisiana, 1990-2023



Before antiretroviral therapy was discovered, fungal and other opportunistic infections were a major problem for people with advanced HIV/AIDS. Since then, the number of fungal infections and deaths due to fungal infections in people with advanced HIV/AIDS have decreased substantially in the U.S. and other developed countries. One study showed that the incidence of cryptococcosis in AIDS patients in the U.S. decreased by approximately 90% in the 1990s. The decrease in opportunistic infections is primarily because earlier diagnosis of HIV and initiation of antiretroviral therapy helped to keep people with HIV from reaching the stage where their immune systems left them most vulnerable to fungal infections and other infections.

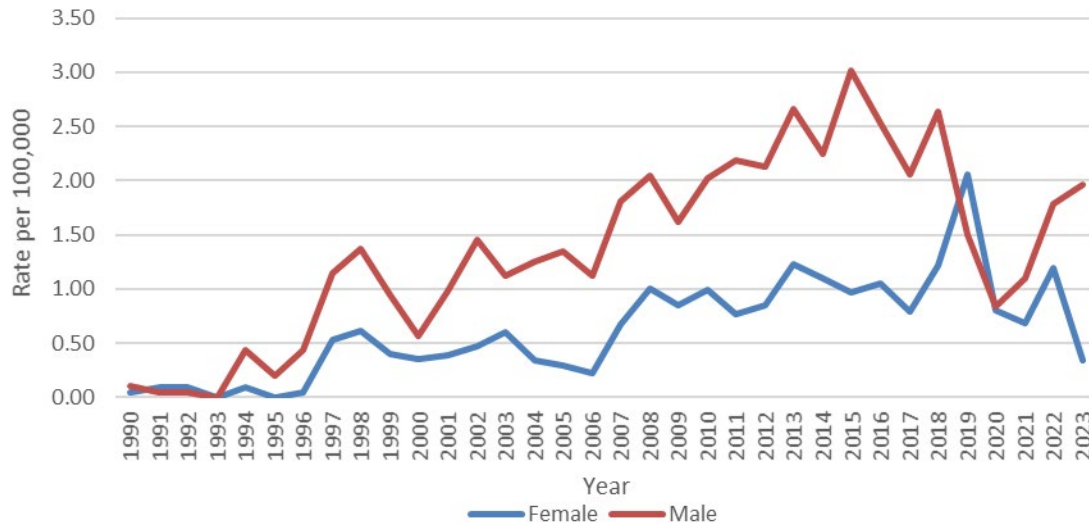
However, fungal diseases, particularly cryptococcosis, are still a concern for people living with HIV/AIDS in the United States. Nationally representative estimates for the incidence of cryptococcosis are difficult to establish because cryptococcosis is only reportable in a few states. Results from active, population-based surveillance in two U.S. locations in the year 2000 indicated that the annual incidence of cryptococcosis among persons with AIDS was between two and seven cases per 1,000; the overall incidence was 0.4 to 1.3 cases per 100,000 population; the case-fatality ratio was approximately 12%.

More recently, an analysis of stored serum samples from HIV-infected persons with low CD4 counts enrolled in studies in the U.S. during 1986 to 2012 found the prevalence of cryptococcal antigenemia to be 2.9%, indicating that the prevalence of cryptococcal infection among HIV patients in the U.S. may be high enough to consider targeted screening.

Age, Gender and Race Distribution

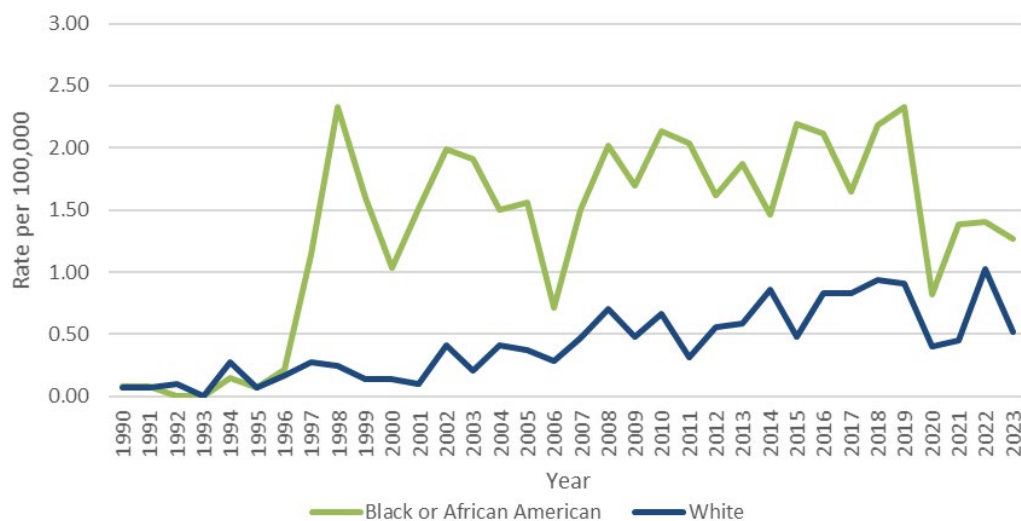
Prior to 1993, males and females experienced similar trends for acquiring cryptococcosis. Post 1993, males have shown to have higher rates of acquiring cryptococcosis than women. (Figure 2).

Figure 2: Rates of *Cryptococcosis* per 100,000 Population by Gender - Louisiana, 1990-2023



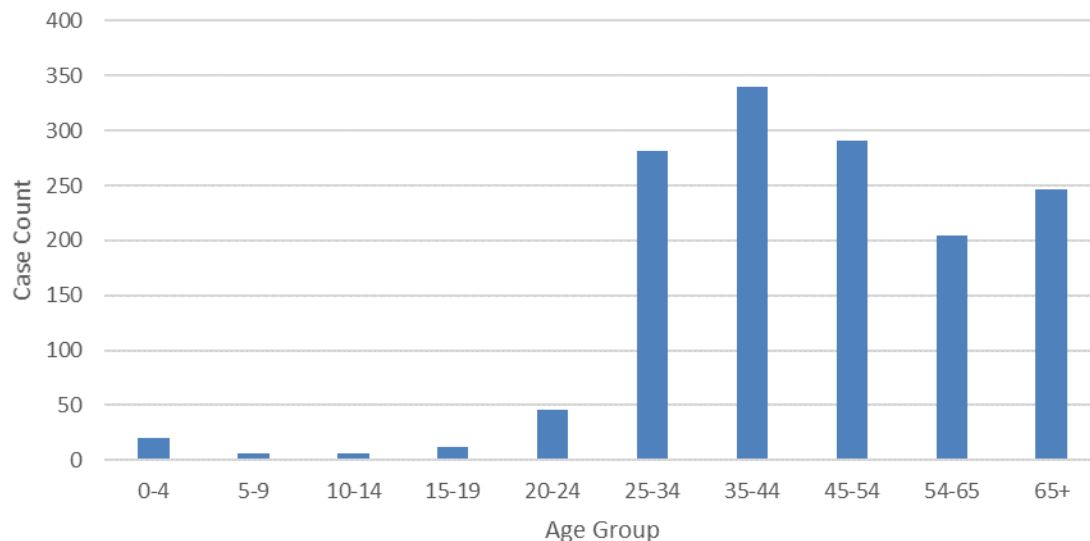
As with trends of cryptococcosis when examining gender, incidence rates for race between White individuals and African-American or Black individuals were similar until 1993. Post-1993 the disparity in incidence rates of cryptococcosis between races increased dramatically (Figure 3). However, race is not consistently reported in all case records, which may affect the accuracy of these comparisons.

Figure 3: Rates of *Cryptococcosis* per 100,000 Population by Race - Louisiana, 1990-2023



Cryptococcosis varies greatly among different age groups and by gender; with males aged 35 to 44 years and females aged 25 to 34 years most at risk. Cases are less frequently observed in younger persons (under 19 years), and are observed at an intermediate level in the elderly (Figure 4). These patterns are likely due to increased immunosuppression due to HIV/AIDS in middle-aged groups (particularly among males), and reduced immunity due to other conditions in the elderly.

Figure 4: Rates of Cryptococcosis per 100,000 Population by Gender and Age Group Louisiana, 1990-2023



An Unusual Cluster of Cases Among Immuno-competent Individuals

In Louisiana in 2003, three cases of cryptococcal meningitis were reported in immunologically competent hospital employees within a period of six months. Common factors identified among the three employees included hospital employment and parking on the third floor of the hospital's garage. None of the three reported to have a history of risk factors for high-level exposure to pigeon droppings.

Large numbers of pigeons had inhabited different areas surrounding the hospital. Pigeons were roosting near the parking garage and air duct with a "large pile of pigeon droppings" having been reported near the fifth floor of the parking garage. Pigeons also roosted on the mechanical pipes and hospital roofs. The final measure taken to address the pigeon problem was to hire a company to extinguish the pigeon population (poisoning).

No definite source was identified for this cluster of three cases. No further cases were identified from that location.