

# 75 Years of Histoplasmosis Outbreaks in the United States

[Announcer] This program is presented by the Centers for Disease Control and Prevention.

[Sarah Gregory] Histoplasmosis has been described as the most common endemic mycosis in the United States. However, it is not nationally notifiable. Its presumed geographic distribution is largely derived from skin test surveys performed during the 1940s, and information about its local features comes primarily from outbreak investigations. The authors conducted a literature review to assess epidemiologic features of histoplasmosis outbreaks in the United States. During 1938 through 2013, a total of 105 outbreaks involving 2,850 cases were reported in 26 states and the territory of Puerto Rico.

Today, I'm talking with Kaitlin Benedict about histoplasmosis in the United States. Kaitlin is an epidemiologist with the CDC. Thank you for being with us today, Kaitlin.

[Kaitlin Benedict] Thank you very much for having me.

[Sarah Gregory] Tell us about histoplasmosis. What causes it?

[Kaitlin Benedict] Histoplasmosis is an infection caused by a fungus called *Histoplasma capsulatum*. It's a fungus that lives in the natural environment, particularly in soil that contains bird or bat droppings. People can get histoplasmosis after breathing in these microscopic fungal spores, often after the soil has been disrupted, which is something that we see a lot in histoplasmosis outbreaks. Many people who are exposed to *Histoplasma* never get sick from it, but for other people, histoplasmosis can be very serious.

[Sarah Gregory] 105 outbreaks in 75 years doesn't seem to be a lot when compared to foodborne outbreaks, which happen several times a year. Why is histoplasmosis a concern?

[Kaitlin Benedict] There are probably many more histoplasmosis outbreaks that weren't included in our review because they weren't published, or investigated, or even recognized. And histoplasmosis outbreaks are just the tip of the iceberg in terms of the total number of infections that occur each year. Histoplasmosis is under public health surveillance in some states, but not everywhere, so we don't have very much data on the true number of people getting infected. However, there's a lot of great information out there about histoplasmosis outbreaks, but not a recent comprehensive review. So we felt it was important to be able to look at the big picture and see what we could learn about what's been happening with histoplasmosis outbreaks in the long term.

[Sarah Gregory] Is there any area of the country where it's most endemic?

[Kaitlin Benedict] Yes, there does seem to be areas of higher endemicity, although we know that the fungus can be found all over the world. There were studies back in the 1940s and 50s where the investigators tested more than 150,000 people all over the United States with a histoplasmin skin test; a positive test usually indicates a past infection. They found that the highest frequency of positive reactions was in states surrounding the Ohio and Mississippi River Valleys. We saw the same geographic distribution in our review when we mapped the locations of histoplasmosis

outbreaks. But we know that the central and eastern United States are not the only areas of the country where histoplasmosis occurs, because there have been cases acquired from outside those areas, too.

[Sarah Gregory] What were some common settings for exposure?

[Kaitlin Benedict] A lot of histoplasmosis outbreaks described in the literature were associated with farms or chicken coops, but we did see a decrease in outbreaks in those settings after the late 1960s, which may be because of changes in chicken farming and production or that people just haven't been publishing information about those types of outbreaks. We also saw many outbreaks in outdoor areas in general, but also quite a few in buildings, especially buildings that were undergoing renovation or demolition. Caves are another setting that people typically think of as a risk for histoplasmosis because there are often bat droppings present.

[Sarah Gregory] How were birds and bats implicated in these outbreaks?

[Kaitlin Benedict] *Histoplasma* really likes to grow in soil that has a high nitrogen content, so it seems to grow well in places where there's a large amount of bird or bat droppings. In the outbreaks we reviewed, 77 percent mentioned that either birds or bats were present in the outbreak setting, and in 40 percent of the outbreak reports there was some mention of disruption of accumulated bird or bat droppings that likely stirred up the fungal spores.

[Sarah Gregory] What causes the fungus to get into the air?

[Kaitlin Benedict] Almost all of the outbreaks we reviewed were thought to be related to some sort of environmental disruption, activities like directly disturbing a large accumulation of bird or bat droppings, digging in soil, cutting down plant matter, or demolition or construction.

[Sarah Gregory] So is histoplasmosis a workplace hazard, too?

[Kaitlin Benedict] Certainly, in specific situations, it can be a concern. We found that about a third of histoplasmosis outbreaks were work-related, usually with jobs involving construction, demolition, or maintenance. So for workers who may disrupt contaminated soil or accumulations of bird or bat droppings in endemic areas, it's important for them and their employers to be aware of the potential for histoplasmosis and try to minimize exposure to *Histoplasma*. For example, by controlling aerosolized dust during activities that disrupt the environment or when removing bird or bat droppings, by properly disposing of potentially contaminated material, and wearing appropriate personal protective equipment.

[Sarah Gregory] How would a person know if they were infected? And is it fatal?

[Kaitlin Benedict] Many people who get infected with *Histoplasma* never have symptoms. But for people who do develop symptoms, they usually appear within a few days to up to 2 weeks or so after exposure. Symptoms are typically fever, cough, fatigue, headache, and chest pain. In our review, we found that only about 1 percent of outbreak-related histoplasmosis cases were fatal, which may be a little bit of an underestimate. Other studies have shown that the mortality rate can be higher in general, in non-outbreak situations, especially in high risk patients who are more likely to have disseminated infections and more severe disease, for example, people with HIV/AIDS.

[Sarah Gregory] So, is there a treatment for it?

[Kaitlin Benedict] Yes, there are good antifungal medications. In some cases, people with mild histoplasmosis will resolve symptoms on their own, without any antifungal treatment. But people with more severe or prolonged acute pulmonary histoplasmosis and disseminated or chronic histoplasmosis do need antifungal treatment, usually with itraconazole or amphotericin B.

[Sarah Gregory] There are so many mycoses. Histoplasmosis, Valley Fever, *Cryptococcus gattii* infection, it seems that simply breathing is perilous. How are clinicians able to tell them apart? Or is it even necessary to do so?

[Kaitlin Benedict] Well, it is true that fungi are everywhere, but thankfully, most of the time, infections are mild. It's very important to try to tell these fungal diseases apart in order to understand what complications to expect and to know which type of antifungal treatment to use, if necessary. There are a number of different diagnostic tests available, many of which, including the tests for histoplasmosis, have improved a lot during the past several decades. That being said, fungal infections can still be challenging to diagnose, partly because the symptoms can be similar to so many other types of infections or even non-infectious illnesses. Often times, people who have fungal infections initially get misdiagnosed with bacterial infections and get treated with unnecessary antibacterial medications or get unnecessary diagnostic testing, which can be expensive and potentially harmful. So it's important for healthcare providers to be aware of the possibility for fungal infections because we know that starting antifungal treatment earlier can lead to better patient outcomes.

[Sarah Gregory] Any suggestions on how to combat further outbreaks?

[Kaitlin Benedict] In general, histoplasmosis can be difficult to prevent because, like you mentioned, it's something that people get by breathing in spores from the environment. One of most important things in helping to prevent future outbreaks and reduce serious complications from these outbreaks is increased awareness. It's important for healthcare providers, public health and occupational safety professionals, and the public to know about the risks for histoplasmosis and, whenever possible, to take appropriate precautions with high-risk activities, such as disrupting large amounts of bird or bat droppings.

[Sarah Gregory] Thank you, Kaitlin. I've been talking with Kaitlin Benedict about her article, *Epidemiology of Histoplasmosis Outbreaks, United States, 1938–2013*, in the March 2016 issue of EID. You can read the entire article online at [cdc.gov/eid](http://cdc.gov/eid).

I'm Sarah Gregory for Emerging Infectious Diseases.

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