

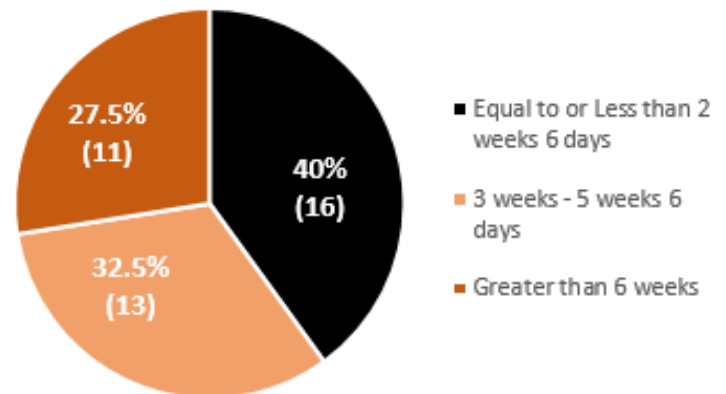
Blastomycosis Cases

Blastomycosis (blasto) is a fungal infection caused by the naturally occurring *Blastomyces* fungus. Although the disease is not common, there are several Lincoln County residents that are diagnosed every year with blastomycosis. Individuals can get blastomycosis by breathing in air around dirt that has been recently disturbed. Other environmental factors such as weather should also be taken into consideration. In the past decade (2013-2022), there have been 40 probable and confirmed cases of blastomycosis reported in Lincoln County. 60% (24/40) of those cases took at least 3 weeks, or more, for the individual to receive fungal testing from the date of the reported onset of symptoms. Lincoln County Health Department conducts disease investigations with these cases. It is unknown when each individual initially sought medical attention. 52.5% (21/40) of the blastomycosis cases in Lincoln County were hospitalized; some of whom unfortunately result in death.

52.5% of Blastomycosis Cases in Lincoln County from 2013-2022 were hospitalized.



Blastomycosis Cases in Lincoln County from 2013-2022: Time of Symptom Onset to Blastomycosis Testing



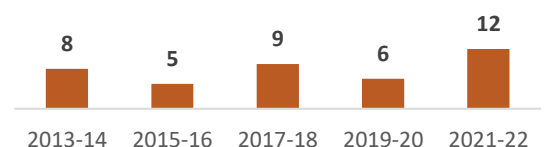
Cases are reported to the Wisconsin Electronic Disease Surveillance System (WEDSS) from clinics, hospitals and labs. In order to be a confirmed case, it must be a clinically compatible* case that meets at least one of the confirmatory laboratory criteria**. A probable case must be a clinically compatible* case that either meets supportive laboratory criteria***, OR does not meet laboratory criteria, but is epidemiologically linked to a confirmed case. Supportive labs (e.g. urine tests) can take up to a few days, while confirmatory labs (e.g. culture) can take up to a couple of weeks.⁴ Of the cases from 2013-2022, 82.5% (33/40) had confirmatory labs. About half of which either had an antigen urine supportive lab or preliminary culture first, prior to having a confirmatory culture resulted.

*Clinically compatible - *At least two* of the following: fever, chest pain, cough, hemoptysis, myalgia, shortness of breath, or headache. **OR** *At least one* of the following: single skin lesion, abnormal chest imaging, or clinical evidence of disseminated (having spread throughout an organ or the body) disease.

Confirmatory laboratory - Culture of blastomycetes from a clinical specimen, **OR identification of blastomycetes large, broad-based, budding yeast in tissue or sterile body fluid by histopathology, **OR** demonstration of blastomycetes-specific nucleic acid using a validated assay (e.g. PCR).

***Supportive laboratory - identification of blastomycetes large, broad-based, budding yeast in tissue or sterile body fluid by cytopathology, **OR** 4-fold rise in blastomycetes serum immunodiffusion antibody titers taken at least two weeks apart, **OR** detection of blastomycetes antigen in serum, urine or other body fluid **AND** no compelling laboratory evidence of another mycotic infection is available.

Number of Blastomycosis Cases in Lincoln County in the past decade (2013-2022)



Signs and Symptoms of Blastomycosis

Symptoms are highly non-specific and can mimic influenza or acute bacterial pneumonia. Symptoms may develop 2 – 15 weeks after being infected with *Blastomyces* spores.

Reported Symptoms in Blastomycosis Cases	
Cough	27
Fatigue	23
Poor Appetite	20
Shortness of Breath	19
Night Sweats	19
Fever	16
Chills	16
Weight Loss	15
Joint Pain	13
Muscle Pain Aches	13
Chest Pain	13
Back Pain	11
Headache	10
Multiple Skin Sores	6

About 50% of individuals infected will not have any symptoms.³ Beyond the common symptoms highlighted above, it is important to be aware of other possible symptoms that individuals could develop, such as, skin sores, headache, chest pain, weight loss, bone pain, and coughing up blood. Possible limitations of this data is investigation requirements change over time and whether or not all symptoms were asked and documented. Investigation could have been with a family member or hospital, if the individual had passed away.

It is widely known that anyone can get blastomycosis. The data pulled in Lincoln County from 2013-2022 confirms it can occur in all ages.

Common Symptoms Could Include:

- ✓ Cough
- ✓ Fever or Chills
- ✓ Night Sweats
- ✓ Fatigue
- ✓ Shortness of Breath
- ✓ Poor Appetite
- ✓ Joint or Muscle Pain

Age of Blastomycosis Cases

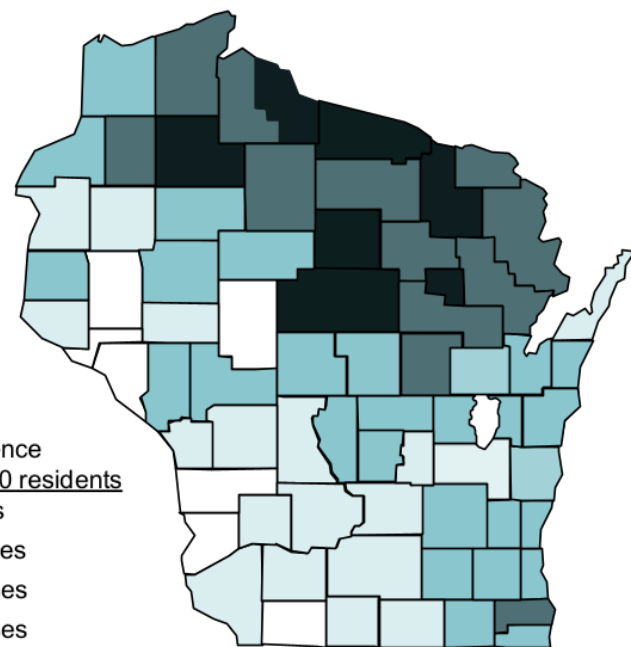
0-9	<5
10-19	8
20-29	<5
30-39	6
40-49	9
50-59	7
60-69	<5
70-79	<5
80-89	<5
90+	0

Incidence and Geography of Blastomycosis

The graph to the right shows the annual incidence of Blastomycosis cases by county of residence, in Wisconsin from 2011 to 2020. Lincoln County's annual incidence is 15.3 per 100,000 population, while Wisconsin as a whole is 2.0 per 100,000. Lincoln County is in the top 5 for the highest incident rates in Wisconsin.

Within Lincoln County, there is a higher prevalence of cases (35) reporting their residence (home address) was in Merrill. Individuals can have a Merrill address and not live within city limits. Home address does not mean that is necessarily where the individual became exposed to the *Blastomyces* spores.

The geography of Merrill can be considered favorable for blastomyces spores to produce, as the Wisconsin and Prairie Rivers run straight through it, with wooded and agricultural surroundings.⁵ Within the city of Merrill, where a majority of the cases were from, all cases were less than a half a mile from either river.



Number of Blastomycosis Cases in Lincoln County from 2013-2022 based on home address

Merrill	35
Tomahawk	5

Conclusions and Summary of Data Analysis

In conclusion, there is a higher than average number of blastomycosis cases in Lincoln County annually, with a majority of them living in Merrill, within half a mile from one of the Wisconsin or Prairie Rivers. Just over half of the total cases were hospitalized due to their infection. Of the cases during 2013-2022, over half of them also took at least 3 weeks or more for testing to occur from when symptoms first began. The delayed time it takes for a culture result to come back, could be part of the reason why it is taking so long to diagnose. Another reason could be that symptoms can vary greatly from person to person and can mimic influenza, acute bacterial pneumonia or other lung infections. This often makes diagnosis of blastomycosis difficult to recognize. Blastomycosis is treatable with antifungal medications. Individuals in Lincoln County who experience health inequities when it comes to blastomycosis include: those who are immune compromised, who have a greater risk of severe illness and poor outcomes; those who are low income, have no medical home, or have a lack of transportation, as they often cannot afford to attend multiple appointments to get diagnosed with blastomycosis; and those who work outdoors or live along the water ways who might be more likely to inhale the *Blastomyces* spores and become infected.

Recommendations for health care providers, employees and residents in Lincoln County include:

1. Health care providers should suspect blastomycosis in anyone presenting with influenza or pneumonia-like illnesses who does not have a definitive diagnosis by standard testing or has not had a timely response to treatment.
2. Residents, especially those who have a weakened immune system or have a chronic respiratory illness, should be aware of the risk associated with disruption of dirt near water sources. Dirt can be disrupted by gardening, camping, hunting, hiking, riding all-terrain vehicles, cleaning brush, excavating or at construction sites. Those individuals at high risk should consider the use of HEPA-filter or dust masks when participating in such activities.⁵
3. Employees engaged in digging or moving soil (e.g. excavation, handling trees, landscaping, outdoor construction or renovation, placement or maintenance of wells, septic systems or utility lines, and activities along waterways) should be aware of their risk of contracting blastomycosis. The Wisconsin Bureau of Environmental and Occupational Health recommends at risk workers consider the environment and wearing personal protective equipment (PPE) such as a facemask or respirator.²
4. Residents and employees should be aware of the signs and symptoms of blastomycosis and immediately contact their health care provider if they have illness consistent with blastomycosis.

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- 6 - Wisconsin Electronic Disease Surveillance System (WEDSS). Data Export 1.2023. 2013-2022.