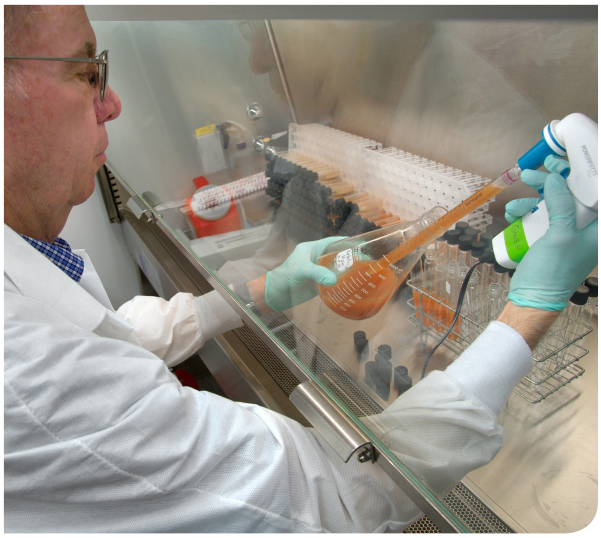
CDC and Fungal Diseases:
Why are fungal diseases a public health issue?

Fungal diseases pose an important threat to public health for several reasons.

- **Opportunistic infections** such as cryptococcosis and aspergillosis are becoming increasingly problematic as the number of people with weakened immune systems rises. This group includes cancer patients, transplant recipients, other people taking medications that weaken the immune system, and people with HIV/AIDS.
- **Hospital-associated infections** such as candidemia are a leading cause of bloodstream infections in the United States. Advancements and changes in healthcare practices can provide opportunities for new and drug-resistant fungi to emerge in hospital settings.
- **Community-acquired infections** such as coccidioidomycosis (Valley fever), blastomycosis, and histoplasmosis, are caused by fungi that live in the environment in specific geographic areas. These fungi are sensitive to changes in temperature and moisture, and we don't know how long-term climate change may be affecting their growth and distribution.



What is CDC doing to combat fungal diseases?

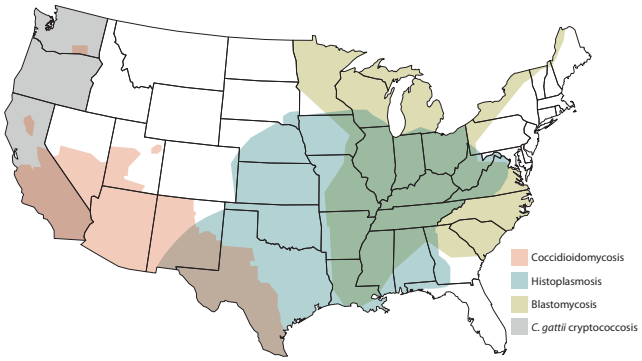
We are taking action to prevent and control fungal diseases through a variety of domestic and international activities:

- **Responding to outbreaks** with epidemiologic investigations
- **Monitoring** long-term trends in fungal diseases through surveillance
- **Developing, evaluating, and promoting** cost-effective prevention guidelines and intervention strategies
- **Detecting and identifying fungal pathogens** in human and environmental samples
- **Assisting laboratories** in developing countries to perform diagnostic tests

Current challenges and future directions:

- **Defining the public health burden** of fungal diseases
- **Developing improved methods** for earlier diagnosis
- **Understanding the geographic distribution** of environmental fungal diseases
- **Determining the effects of climate conditions** on environmental disease-causing fungi
- **Identifying groups of people at highest risk** to help focus prevention strategies
- **Providing education** to healthcare providers and **raising awareness** among the public about the threat of fungal diseases

Endemic Fungal Diseases in the United States



The shaded areas, where certain disease-causing fungi are suspected to live in the United States, are approximate and deserve further study.

National Center for Emerging and Zoonotic Infectious Diseases
Division of Foodborne, Waterborne, and Environmental Diseases

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Preventing deaths from cryptococcal meningitis

In people with weakened immune systems, the fungus *Cryptococcus neoformans* causes life-threatening meningitis in hundreds of thousands of people every year. *Cryptococcus* is the most common cause of meningitis in sub-Saharan Africa, and is a leading cause of death among people with HIV. A simple, affordable blood test for cryptococcal antigen can detect cryptococcal infection before meningitis develops, creating opportunities to prevent this deadly disease. CDC is helping implement targeted cryptococcal screening programs and build laboratory capacity to detect these infections early. This allows for more timely treatment, reduced mortality, and overall improved quality of life.

CDC is working with several countries on strategies to prevent deaths due to cryptococcal meningitis.

Monitoring *Candida* bloodstream infections with multi-state surveillance

Candida is a common cause of hospital-associated bloodstream infections in the United States. CDC has identified improved adherence to infection prevention guidelines and improved national surveillance as two important healthcare-associated infection prevention "Winnable Battle" goals. CDC conducts population-based, active laboratory surveillance in several U.S. locations to monitor the epidemiology of candidemia and trends in antifungal drug resistance among different *Candida* species. Surveillance indicates that candidemia is a particular problem in infants and the elderly and that resistance to some antifungal medications is an emerging public health issue. Results from the ongoing surveillance allow CDC to identify areas to focus candidemia prevention and intervention strategies.

Disease detectives respond to new fungal threats

Responding to outbreaks and emerging threats is a core part of CDC's work on fungal diseases. Valley fever sickens thousands of people every year when they inhale the microscopic fungus *Coccidioides*. Until recently, scientists believed that *Coccidioides* only lived in soil in the Southwestern United States and parts of Latin America. The fungus was discovered in south-central Washington after several residents developed Valley fever. Samples from one patient and soil from the suspected exposure site were identical by whole genome sequencing, proving that the infection was acquired in Washington. CDC is developing new tools that make it faster and easier to detect *Coccidioides* in the environment. Those tools will help scientists determine where a person was most likely infected, how strains are related, and which areas could pose a risk – information that is essential for raising awareness about the disease among other public health officials, healthcare providers, and the public.

Coccidioides lives in dry, dusty soil. It was recently found in south-central Washington.

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