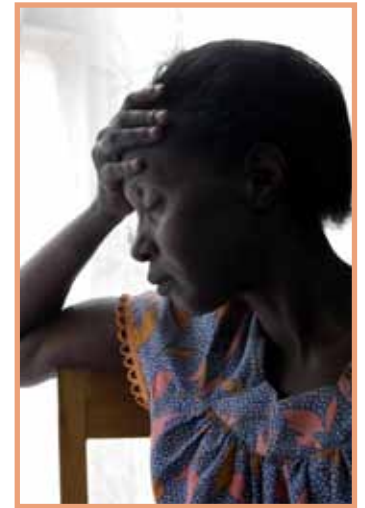


Cryptococcal meningitis: a deadly fungal disease among people living with HIV/AIDS



Cryptococcal Infection

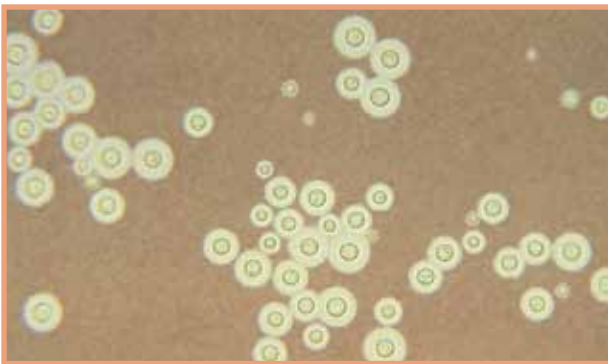


What is *Cryptococcus*?

Cryptococcus is a fungus that is found in the soil throughout the world. Because *Cryptococcus* is common in the environment, most people probably breathe in small amounts of microscopic, airborne spores every day. Sometimes these spores cause symptoms of a respiratory infection, but other times there are no symptoms at all. In healthy people, the fungus usually does not cause serious illness because the immune system can fight off the infection. However, in people with weakened immune systems, such as people with HIV/AIDS, the fungus can stay hidden in the body and later reactivate, spreading to other parts of the body and causing serious disease.

Cryptococcal meningitis

An infection with the fungus *Cryptococcus* is known as cryptococcosis, and it is a serious opportunistic infection among people with advanced HIV/AIDS. Cryptococcosis is not contagious, meaning it cannot spread from person-to-person. Cryptococcal meningitis specifically occurs after *Cryptococcus* has spread from the lungs to the brain. Meningitis can also be caused by a variety of other organisms, including bacteria, viruses, and other fungi.



Microscopy of *Cryptococcus neoformans*.

Symptoms of meningitis include:

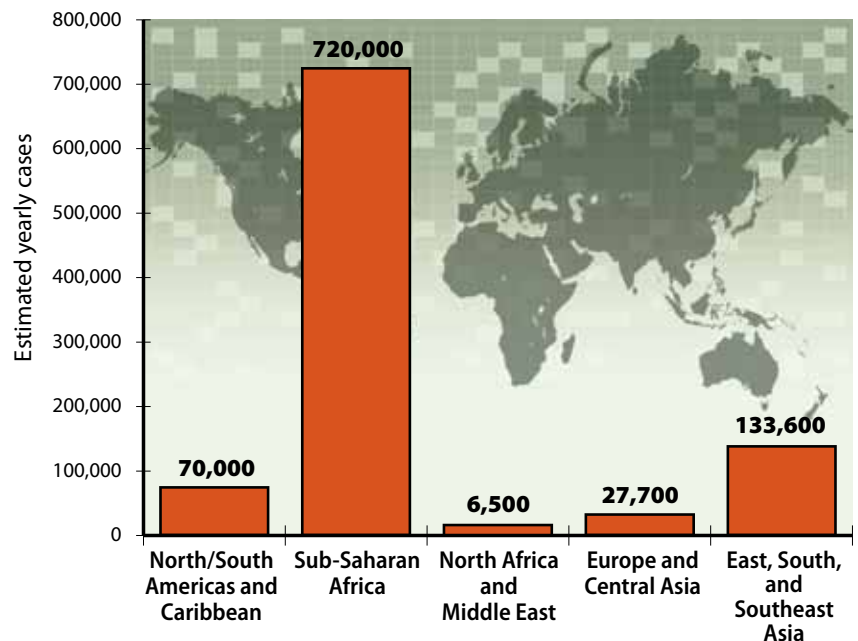
- Headache
- Fever
- Neck pain
- Nausea and vomiting
- Sensitivity to light
- Altered mental status (ranging from confusion to coma)



A global problem

Worldwide, approximately 1 million new cases of cryptococcal meningitis occur each year, resulting in 625,000 deaths. Most cases are opportunistic infections that occur among people with HIV/AIDS. Although the widespread availability of antiretroviral therapy (ART) in developed countries has helped reduce cryptococcal infections in these areas, it is still a major problem in developing countries where access to healthcare is limited. Throughout much of sub-Saharan Africa, for example, *Cryptococcus* is now the most common cause of adult meningitis. Cryptococcal meningitis is one of the leading causes of death in HIV/AIDS patients; in sub-Saharan Africa, it may kill as many people each year as tuberculosis.

The Global Burden of Cryptococcal Meningitis





Preventing Deaths Due to *Cryptococcus*



Targeted screening: a cost-effective strategy

One approach to prevent deaths is known as “targeted screening.” Cryptococcal antigen, a chemical marker for infection, can be present and detected in the body weeks to months before the onset of symptoms. In a targeted screening program, HIV-infected patients are tested for cryptococcal antigen before starting ART. A patient who tests positive for cryptococcal antigen can take oral fluconazole to help the body fight the early stage of the infection. This could prevent the infection from developing into meningitis.

A simple new test for *Cryptococcus*

A new “dipstick” test for detecting cryptococcal antigen is simple to use on a small sample of serum (a component of blood). The test accurately detects both early and advanced cryptococcal infections more than 95% of the time. In addition, the test is inexpensive, and the results are ready in just 10 minutes.



Access to essential care



In order to screen patients for cryptococcal disease, as well as diagnose other patients with cryptococcal meningitis, healthcare facilities must have access to diagnostic tests. Currently, these tests are unavailable in most district and provincial laboratories in sub-Saharan Africa. Equipping these facilities with the ability to perform the new dipstick test is an important step in combating cryptococcal meningitis.



Essential medications for the treatment of cryptococcal disease are also lacking in areas of the world that are most in need. Amphotericin B and flucytosine, antifungal medications that have been shown to improve survival in patients with advanced disease and are the standard-of-care in developed countries, are widely unavailable in sub-Saharan Africa.

Integration with HIV/AIDS care and treatment



Like co-trimoxazole prophylaxis and isoniazid preventive therapy (IPT), cryptococcal screening and treatment of antigenemia with oral fluconazole can be part of an integrated care and treatment strategy for people living with HIV/AIDS. In areas where cryptococcal disease prevalence is high, an integrated approach can help reduce early mortality among HIV/AIDS patients starting ART.

CDC’s response

CDC is focusing its efforts on countries in sub-Saharan Africa and Southeast Asia, the areas with the highest number of deaths due to cryptococcal disease. In these regions, CDC is helping build laboratory capacity to reliably diagnose cryptococcal infections and is assisting with the implementation of targeted cryptococcal screening programs. In the future, it is hopeful that diagnostic tests will be available even in remote, rural areas.

CDC’s call to action is to equip half of all HIV clinics in Africa and Asia in areas with a high prevalence of HIV/AIDS to perform cryptococcal screening and treatment, which could save 50,000 to 100,000 lives every year. Early identification of cryptococcal-infected patients in resource-limited settings may lead to more timely treatment, reduced mortality due to cryptococcal meningitis, and overall improved quality of life.

What You Can Do

Physicians and other healthcare providers can:

- Familiarize themselves with the World Health Organization's most up-to-date guidelines on the diagnosis, prevention, and management of cryptococcal disease in HIV-infected individuals, available on the web at: http://whqlibdoc.who.int/publications/2011/9789241502979_eng.pdf
- Be aware of the benefits of targeted screening for cryptococcal antigenemia among patients at risk
- Advocate to implement cryptococcal screening programs at clinics where the prevalence of HIV/AIDS is high
- Teach at-risk patients about *Cryptococcus* and the importance of screening for cryptococcal antigenemia
- Advocate for cryptococcal diagnostic capabilities and increased availability of antifungal treatment in resource-limited settings
- Visit <http://preventcrypto.org/> to learn more about how to prevent deaths due to *Cryptococcus*



Images on this page are courtesy of the World Health Organization.

Non-governmental organizations (NGOs) can:

- Partner with healthcare facilities to consider implementing targeted cryptococcal screening programs in areas of the world where the prevalence of HIV/AIDS is high
- Get involved with monitoring and evaluation of existing cryptococcal screening programs
- Advocate for cryptococcal diagnostic capabilities and increased availability of antifungal treatment in resource-limited settings

Government organizations can:

- Create policies that support the development of sustainable cryptococcal screening programs
- Ensure cryptococcal diagnostic capabilities and adequate access to antifungal medications
- Develop national guidelines for the diagnosis, management, and prevention of cryptococcal disease which are consistent with the World Health Organization's recommendations

For more information, please contact the

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