Reports of human infections with environmental fungi are on the increase throughout the world. Many of these reports describe infections caused by new agents, as well as by traditional agents with new virulence factors or new mechanisms of infection. Fungal infections historically have been underrecognized and difficult to detect, and treatment options are poor.

The reasons for their emergence are likely multifactorial. The advent of medical progress—including the wide use of medical hardware, such as central lines; successful management of immunosuppression in patients with transplanted organs; and immunomodulatory agents for treating underlying diseases from cancer to rheumatoid arthritis—has contributed to the increase in fungal infections in immunocompromised hosts. Risk factors such as changes in land use, seasonal migration, international travel, extreme weather, and natural disasters, and the use of azole antifungal agents in large-scale agriculture are believed to underlie many of the increases in community-acquired fungal infections.

Because fungal infections are frequently underrecognized and difficult to detect, one of the largest gaps in our understanding of their epidemiology is determining the incidence of disease. In an article in this issue of Emerging Infectious Diseases, Sondermeyer et al. document the incidence and cost of hospitalizations in California caused by Valley fever (coccidioidomycosis), a fungal infection endemic to the southwestern United States and parts of Latin America (J). This article reports that during 2000–2011, there were >25,000 Valley fever–associated hospitalizations in California caused by Coccidioides immitis. Although the root cause was not determined, speculation has centered on changes in land use patterns and agricultural practices in California.

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novel lateral-flow diagnostic tests for cryptococcal disease has opened the door to systematic screening and point-of-care testing in asymptomatic persons with low CD4 cell counts and may result in reduction of deaths caused by this disease (8,9). Conversely, recent contamination of a widely distributed injectable steroid medication with fungal organisms, particularly the black mold Exserohilum rostratum, caused the largest health care–associated outbreak in the United States; as of July 1, 2013, there have been 749 cases of meningitis and related infections among persons in 20 states and 61 deaths (10,11). Swift public health actions, including notification of patients and providers, led to rapid clinical assessments and institution of antifungal therapy among infected persons, thereby reducing the mortality rate and effects of this disease (12).

Broader control of fungal exposures in the community can also be improved by awareness, especially education regarding high-risk practices and activities. Outbreaks of histoplasmosis linked to construction and cleaning activities in places contaminated with bird or bat guano have led to production of educational materials describing how risk can be mitigated (13). Furthermore, recent advances in whole-genome sequencing are being explored to suggest novel vaccine and diagnostic targets for the agent of Valley fever (14).

Fungal infections remain serious and underappreciated causes of illness and death. Much can be done to prevent the consequences of these infections, although environmental exposure to these agents may not be entirely avoidable in the community. Continued public health efforts toward defining, characterizing, and tracking the emergence of fungal infections can help to focus studies on priority infections and settings. Future translational research is urgently needed to develop novel diagnostics, vaccines, and treatments as more is learned about the pathogenesis of fungal infections and the biology of fungal agents.

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References


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