

News and Perspectives

New WHO Blueprint and Digital Platform Look to Strengthen Surveillance of Fungal Disease and Antifungal Resistance

Sara Novak, JMIR Correspondent

Abstract

Fungal disease and antifungal resistance are growing, historically underrecognized global threats that are difficult to detect and track. In this *News and Perspectives* article, JMIR Correspondent Sara Novak reports on two recent policy and digital health initiatives that aim to improve surveillance and close critical gaps in the global response to these public health concerns.

Key Takeaways:

- Fungal disease and antifungal resistance are a growing public health threats globally.
- The World Health Organization (WHO) released a new blueprint to help countries begin to create uniform tools for a public health response.
- Researchers are launching a digital platform using AI to extract information about fungal diseases and antifungal resistance from electronic medical records to make that data available to clinicians and stakeholders.

Fungal diseases and antifungal resistance are growing public health threats globally, with more than [300 million people](#) affected by fungal diseases each year and over [3.75 million people](#) dying annually. Among immunocompromised patients, invasive fungal infections are the “leading cause of mortality and morbidity” according to a [2025 World Health Organization \(WHO\) report](#).

In recent years, the number of new infections, and especially antifungal-resistant infections, has doubled as the [climate warms and fungi adapt](#) to survive in warmer climates. Increased flooding events have also contributed to mold growth that leads to disease spread. The use of fungicides on agricultural crops is also a major cause of antifungal resistance in health care settings.

While their prevalence is increasing, fungal infections are still not as common as viral infections so we don’t have as many diagnostic tools to test for them. With relatively fewer resources allocated to fungal disease research, surveillance, and response, fungal diseases also fall behind bacterial infections in terms of treatment options, but recent policy developments and digital health initiatives are working to change this.

Why Fungal Diseases Are Difficult to Diagnose and Treat

One of the biggest challenges to fungal disease preparedness is that they are underdiagnosed, which makes research, surveillance, and response more difficult.

“If we don’t have good diagnostic tests, these diseases don’t exist because we don’t know who has them,” said [Tom](#)

[Chiller](#), MD, former chief of the Mycotic Diseases Branch at the Centers for Disease Control and Prevention.

He adds that diagnosing fungal disease is inherently difficult because fungal cells look similar to human cells, making it challenging to get a diagnostic test that’s sensitive enough to tell the difference. Fungi are also [everywhere around us](#), billions of them—exposure is “near universal,” and it’s hard to distinguish the colonies that are causing disease from those that are harmless.

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If we can’t get humans to agree on what a fungal disease is, we can’t train a machine to look for it.

Vlada Rozova, PhD

Further, because fungal cells are so similar to human cells, it remains very challenging to kill one type of cell without also killing the other, making treatment toxicity a major issue. And with only [three major classes](#) of antifungal drugs—azoles, echinocandins, and polyenes—resistance is a larger problem because we don’t have as many tools in our toolbox when a fungal pathogen becomes resistant.

Fortunately, new [antifungal drugs](#) that are currently in various stages of development and investigation may help with resistance. Oteseconazole and rezafungin received US Food and Drug Administration approval in recent years, building on the existing antifungal classes and expanding our arsenal. Two even newer antifungal treatments, olorofim and fosmanogepix, represent new classes and will hopefully be approved in the coming years.

A Blueprint for Improving Antifungal Care

While millions of fungi exist, only a [few hundred of them](#) can cause human disease. Some of the most common and well-known fungal diseases include ringworm, vaginal yeast infections, athlete's foot, skin infections like sporotrichosis, and mold infections like aspergillosis, as well as invasive infections like cryptococcal meningitis and candidiasis. The most dangerous fungal disease is multidrug-resistant *Candida auris*, which was first identified in a Japanese hospital in 2009 and has been found fatal in [29% to 62% of cases](#).

Without surveying when these conditions are diagnosed and treated, we can't have accurate knowledge of which diseases are the most prevalent and when they become resistant to the available antifungal treatments. What's more, stewardship programs to protect against resistance remain weak and limited in their scope, especially in underresourced countries.

Recognizing this gap, the WHO released a new [blueprint](#) in June 2026 to help countries begin to create uniform tools to respond to the growing public health threat around fungal disease and antifungal resistance. The report provides a framework with recommendations to guide the implementation of efforts to increase awareness and strengthen public health initiatives; build laboratory networks and surveillance systems; stimulate research and improve access to diagnosis and treatment; and address factors that contribute to disease and resistance. It aims to support countries in their disease response and to make more fungal diseases reportable to public health officials. Across the United States, for example, while reporting priorities vary across different states, the only fungal diseases that have been prioritized as legally reportable nationally are coccidioidomycosis (Valley fever) and *Candida auris*—which are only a small portion of those that can impact human health.

Chiller said that he hopes the report will bring more attention to the prevalence and also morbidity of these infections to improve available funding. Increasing resources will be

particularly useful for investing in new treatments to stave off antifungal resistance.

A Digital Platform for Fungal Disease and Antifungal Resistance Surveillance

Additionally, Australian researchers are in the final stages of launching an [automated fungal infection surveillance platform](#) that will help digitally survey fungal disease across the continent.

The digital platform, called the Design Thinking Framework, was built from a review of multiple sources of clinical information across a wide array of health care settings in Melbourne. It extracts information from electronic medical records (EMRs) using AI that's trained to detect episodes of fungal disease even when it's not explicitly mentioned. The tool will also provide a web-based platform accessible to physicians so that they can properly report future episodes of fungal disease and resistance.

[Vlada Rozova](#), PhD, a senior lecturer in AI in Health at Monash University who originally headed up the project at the University of Melbourne, said the Design Thinking Framework will be helpful in monitoring what is being prescribed for fungal diseases across a range of hospitals to know when this leads to resistance and what can be done to reduce it, while also learning which treatments are most effective in helping patients.

"It will help clinicians to better evaluate the therapies that they're providing their patients to know what's necessary and in what particular types of patients certain antifungal agents are most effective," said Rozova.

The biggest challenge for Rozova and her colleagues has been standardizing clinical annotations to ensure that reports are consistent across the platform. Getting clinicians to agree on which notes within EMRs indicate fungal disease and which indicate resistance has been and will continue to be a complex task because humans, unlike machines, aren't standardized.

"If we can't get humans to agree on what a fungal disease is, we can't train a machine to look for it," said Rozova.

Increased awareness will hopefully bring increased agreement and, with guidance from global bodies like the WHO and new digital surveillance platforms like this, will help to strengthen the global response to fungal infections and antifungal resistance.

Keywords: fungal diseases; antifungal agents; drug resistance; fungal; disease surveillance; public health informatics; electronic health records; artificial intelligence; World Health Organization; AI

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