# Climate change set to expand deadly Aspergillus fungus range, threatening millions



A recent study has raised alarm over the potential global spread of a deadly fungus, linking climate change to an increase in severe disease threats. The research focuses primarily on the Aspergillus family of fungi, which could extend its reach into more northern areas of Europe, Asia, and the Americas as temperatures rise. According to Norman van Rhijn, a co-author of the study and a Wellcome Trust research fellow at Manchester University who specialises in fungal infections and microbial evolution, “We’re talking about hundreds of thousands of lives, and continental shifts in species distributions.” He warns that in 50 years, the geographical landscape of fungal infections is set to change dramatically.

Current estimations denote that invasive fungal infections claim the lives of approximately 3.8 million individuals annually, with the pathogen responsible for directly causing 2.5 million of those deaths. The repercussions of these infections often remain hidden because of their difficult-to-detect nature and the late diagnosis linked to unfamiliarity among medical professionals and symptom overlap with other diseases.

Aspergillosis, a lung disease caused by Aspergillus spores, accounts for significant morbidity and mortality, particularly among individuals with compromised immune systems, such as those with conditions like asthma, cystic fibrosis, or those undergoing chemotherapy. While many fungal species are beneficial, others, like Aspergillus fumigatus, identified by the World Health Organization in 2022 as a critical fungal pathogen, harbour dangerous risks. The latest research indicates that A. fumigatus could potentially expand its territory by an alarming 77% by 2100 if reliance on fossil fuels continues unabated, thus exposing an additional 9 million people in Europe to risks of infection.

The study, funded by Wellcome and published recently, denotes that A. fumigatus thrives at high temperatures, thus potentially facilitating its ability to colonise human lungs. Professor Elaine Bignell, co-director at the MRC Centre for Medical Mycology at Exeter University, noted the rapid growth of this species in environments like compost, where temperatures can simulate those of the human body.

A secondary threat identified in the research is Aspergillus flavus, known for its presence on various crops. Projections suggest it could spread into 16% more territory by 2100, finding new footholds in regions such as northern China, Russia, Scandinavia, and Alaska. Darius Armstrong-James, a professor of infectious diseases and medical mycology at Imperial College London, expressed concern regarding the implications this spread may have on both human health and food security.

A. flavus poses additional risks as it produces aflatoxins, harmful chemicals that can lead to cancer and severe liver damage. Higher temperatures and elevated CO2 levels have been linked to increased aflatoxin production, which raises troubling concerns about the contamination of food sources. Deforestation and extreme weather patterns, connected to climate change, are likely to exacerbate these risks, contributing to the release of spores into the environment.

Emerging research from the University of California, Berkeley reveals that fungal pathogens like Coccidioides, responsible for the severe respiratory disease Valley fever, are already expanding their habitats in line with climate-induced changes. Such shifts have been noted to initiate the release of spores following droughts and heavy rainfall.

The recent study has underscored the urgent need for improved understanding and treatment of fungal infections. Brittany Bustamante, a researcher at UC Berkeley focused on the epidemiology of aspergillosis, observed a recent rise in cases among specific demographics, including Latino individuals and those in rural areas. The correlation between these factors and the aftermath of severe Covid-19 cases remains an area of active investigation.

The findings urge healthcare systems to prepare for the potential rise in respiratory illnesses linked to climate change, noting that populations with pre-existing health disparities are likely to face the greatest risks. The study illuminates the growing interplay between climate change and public health, particularly in the context of infectious diseases linked to fungal pathogens.

Source: [Noah Wire Services](https://www.noahwire.com)

## References

* <https://www.ft.com/content/506f5a03-8520-40e1-aee3-a6e6427f68c0> - This article discusses how rising global temperatures due to climate change are accelerating the spread of dangerous fungal pathogens, particularly those in the Aspergillus family, and projects their expansion into new territories in Europe, Asia, and the Americas.
* <https://vfce.arizona.edu/news/how-climate-change-could-make-fungal-diseases-worse> - This resource from the Valley Fever Center for Excellence at the University of Arizona explains how climate change could exacerbate fungal diseases, including those caused by Aspergillus species, by altering environmental conditions favorable to their growth.
* <https://www.eea.europa.eu/en/analysis/publications/mycotoxin-exposure-in-a-changing-european-climate> - This publication by the European Environment Agency examines how climate change may affect mycotoxin exposure in Europe, noting that under a +2°C temperature-increase scenario, aflatoxin contamination in maize is predicted to increase, particularly in southern Europe.
* <https://cabiagbio.biomedcentral.com/articles/10.1186/s43170-024-00305-3> - This comprehensive review discusses how climate variations impact aflatoxin contamination, highlighting that global warming and rising greenhouse gas emissions are increasing aflatoxin contamination in middle-latitude regions, with Aspergillus flavus and A. parasiticus being more likely to thrive and produce aflatoxin in response to rising temperatures.
* <https://iopscience.iop.org/article/10.1088/1748-9326/ac6435> - This study models aflatoxin risk in the U.S. corn-growing regions, suggesting that over 89.5% of corn-growing counties in 15 states, including the Corn Belt, will experience increased aflatoxin contamination in 2031–2040 compared to 2011–2020, due to climate change.
* <https://ift.onlinelibrary.wiley.com/doi/full/10.1111/1541-4337.13323> - This comprehensive review examines how climate change impacts mycotoxin contamination, noting that Aspergillus flavus, a tropical and drought-tolerant mycotoxigenic fungus, tolerates a wide range of temperatures and is expected to become more prevalent in regions like southern Europe due to climate change.
* <https://www.ft.com/content/506f5a03-8520-40e1-aee3-a6e6427f68c0> - Please view link - unable to able to access data