# Climate change fuels alarming rise in deadly Aspergillus fungal infections across Europe



Research indicates a looming public health crisis as the climate crisis accelerates the spread of infectious fungi, particularly the Aspergillus genus. This group of fungi, responsible for an alarming number of annual fatalities globally, is predicted to expand significantly into new regions due to rising temperatures. Current estimates suggest that fungal infections contribute to around 2.5 million deaths each year, but some experts believe this figure could be as high as 3.8 million, underscoring a serious health concern that remains vastly underexplored.

Aspergillus fungi are ubiquitous, thriving in soil and organic matter and dispersing through airborne spores. Most individuals may breathe in these spores without consequence; however, those with compromised immune systems, such as patients with cancer or lung conditions, are particularly vulnerable. Aspergillosis, the disease caused by inhaling the spores, can be life-threatening, with mortality rates ranging from 20% to 40%. Compounding this issue is the fact that diagnosis is often difficult due to its symptoms overlapping with more common respiratory illnesses.

Recent studies by a team at Manchester University have highlighted the potential future spread of these fungi. If current trends continue, Aspergillus flavus, which thrives in warmer climates, could increase its geographical range by about 16% within 15 years, leading to over a million additional individuals at risk in Europe alone. This species not only affects human health but also poses a threat to food crops, raising concerns about food security and the potential for economic fallout.

Furthermore, Aspergillus fumigatus, which prefers more temperate conditions, may expand its distribution by a staggering 77.5% by the close of the century. This could put as many as nine million people in Europe at increased risk of severe health issues. The intertwining of rising temperatures and fungal adaptability presents an especially dire situation for public health systems — one that is poorly prepared for such challenges.

Extreme weather events, exacerbated by climate change, also play a role in the spread of fungal pathogens. Historical data reveals that spikes in fungal diseases often follow natural disasters, such as the surge in cases after the 2011 tornado in Joplin, Missouri. As climate conditions shift, experts warn that fungi's tolerance for elevated temperatures may shift their dynamic within human hosts and the environment alike.

The rising tide of fungal infections has been made more salient through popular culture, notably the HBO series "The Last of Us," which depicts a fictional scenario of a mutant fungus ravaging humanity. While this narrative is exaggerated, the reality of fungal infections is grave and necessitates urgent attention and action.

Elaine Bignell, co-director of the Medical Research Council Centre for Medical Mycology, has emphasised the urgent need for increased research and public awareness of these pathogens. The neglect of fungal diseases is particularly alarming given their increasing prevalence and resistance to treatments; currently, there are only four classes of antifungal medicines available, constraining effective responses to infections.

The urgency of this issue is further underscored by ongoing studies in the U.S. that have tracked aspergillosis cases across over 100 million patients, illustrating a 5% annual increase in incidence from 2013 to 2023. As Bignell stated, “There is a desperate need to reverse this trend given the lethality."

The intersection of climate change and public health cannot be overstated. As the planet continues to warm, the proliferation of fungi like Aspergillus poses a significant challenge that not only threatens individual health but also the broader fabric of ecosystems reliant on these organisms for their roles in nutrient recycling and soil health. Awareness and preparedness must increase to counteract the impending implications of this silent crisis.

## Reference Map:

* Paragraph 1 – [[1]](https://www.rnz.co.nz/news/world/562083/aspergillus-fungi-that-can-eat-you-from-the-inside-out-could-spread-as-the-world-heats-up), [[2]](https://www.ft.com/content/506f5a03-8520-40e1-aee3-a6e6427f68c0), [[3]](https://www.ft.com/content/2df0ad08-65b6-483a-a59c-2af40d8afc23)
* Paragraph 2 – [[1]](https://www.rnz.co.nz/news/world/562083/aspergillus-fungi-that-can-eat-you-from-the-inside-out-could-spread-as-the-world-heats-up), [[4]](https://wellcome.org/news/climate-change-putting-millions-more-people-risk-infection-causing-fungi), [[5]](https://www.manchester.ac.uk/about/news/climate-change-putting-millions-more-people-at-risk-from-infection-causing-fungi/)
* Paragraph 3 – [[2]](https://www.ft.com/content/506f5a03-8520-40e1-aee3-a6e6427f68c0), [[6]](https://www.eea.europa.eu/en/analysis/publications/mycotoxin-exposure-in-a-changing-european-climate)
* Paragraph 4 – [[4]](https://wellcome.org/news/climate-change-putting-millions-more-people-risk-infection-causing-fungi), [[7]](https://www.independent.co.uk/bulletin/news/aspergillus-fungus-mould-europe-b2745747.html)
* Paragraph 5 – [[1]](https://www.rnz.co.nz/news/world/562083/aspergillus-fungi-that-can-eat-you-from-the-inside-out-could-spread-as-the-world-heats-up), [[5]](https://www.manchester.ac.uk/about/news/climate-change-putting-millions-more-people-at-risk-from-infection-causing-fungi/), [[7]](https://www.independent.co.uk/bulletin/news/aspergillus-fungus-mould-europe-b2745747.html)
* Paragraph 6 – [[2]](https://www.ft.com/content/506f5a03-8520-40e1-aee3-a6e6427f68c0), [[3]](https://www.ft.com/content/2df0ad08-65b6-483a-a59c-2af40d8afc23), [[4]](https://wellcome.org/news/climate-change-putting-millions-more-people-risk-infection-causing-fungi)
* Paragraph 7 – [[5]](https://www.manchester.ac.uk/about/news/climate-change-putting-millions-more-people-at-risk-from-infection-causing-fungi/), [[6]](https://www.eea.europa.eu/en/analysis/publications/mycotoxin-exposure-in-a-changing-european-climate), [[3]](https://www.ft.com/content/2df0ad08-65b6-483a-a59c-2af40d8afc23)

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## Bibliography

1. <https://www.rnz.co.nz/news/world/562083/aspergillus-fungi-that-can-eat-you-from-the-inside-out-could-spread-as-the-world-heats-up> - Please view link - unable to able to access data
2. <https://www.ft.com/content/506f5a03-8520-40e1-aee3-a6e6427f68c0> - A Financial Times article discusses new research warning that climate change is accelerating the global spread of dangerous fungal pathogens, particularly Aspergillus species. Rising temperatures are enabling Aspergillus fumigatus and Aspergillus flavus to expand into northern regions of Europe, Asia, and the Americas. These fungi pose serious health risks, especially to people with weakened immune systems. Aspergillosis, a lung disease caused by inhalation of Aspergillus spores, kills hundreds of thousands annually, with many cases going undiagnosed due to unfamiliarity and symptom overlap with other conditions.
3. <https://www.ft.com/content/2df0ad08-65b6-483a-a59c-2af40d8afc23> - An article from the Financial Times reports that Professor David Denning of the University of Manchester has alarmed the public health community by publishing figures that double previous estimates of the incidence and mortality of invasive fungal infections. According to his article in The Lancet Infectious Diseases, 3.8 million people die annually from these infections, with the fungus being the primary cause in 2.5 million cases. This finding highlights the neglect of this factor in global mortality, now representing approximately 5% of all deaths, a trend that mycologists expect climate change to exacerbate.
4. <https://wellcome.org/news/climate-change-putting-millions-more-people-risk-infection-causing-fungi> - A Wellcome article discusses projections showing that in 15 years, if reliance on fossil fuels continues, certain fungal pathogens are likely to spread significantly in Europe. Under this scenario, the spread of Aspergillus flavus could increase by about 16%, putting 1 million more people at risk of infection in Europe. Infections affect the respiratory system, and this fungus infects a broad range of agricultural crops. The predictions also show that the spread of Aspergillus fumigatus could increase by 77.5% and potentially expose 9 million people in Europe.
5. <https://www.manchester.ac.uk/about/news/climate-change-putting-millions-more-people-at-risk-from-infection-causing-fungi/> - An article from the University of Manchester reports that researchers forecast an increased risk of infection from fungi over the coming years, including a significant spread of some fungal pathogens across Europe. The extent of this spread will depend on global actions to mitigate climate change. Projections show that in 15 years, if reliance on fossil fuels continues, the spread of Aspergillus flavus could increase by about 16%, putting 1 million more people at risk of infection in Europe. The spread of Aspergillus fumigatus could increase by 77.5% and potentially expose 9 million people in Europe.
6. <https://www.eea.europa.eu/en/analysis/publications/mycotoxin-exposure-in-a-changing-european-climate> - A publication from the European Environment Agency discusses how climate change is affecting mycotoxin exposure in Europe. Under a +2°C temperature-increase scenario, the study predicts that aflatoxin (AF) contamination in maize will increase, particularly in southern Europe. In a +5°C scenario, the contamination risk may decrease in southern regions due to extreme heat, but risks will widen geographically to include more northern European countries. This change in the spread of fungal species in Europe will alter exposure patterns, resulting in people being exposed to different mycotoxins with varying health effects.
7. <https://www.independent.co.uk/bulletin/news/aspergillus-fungus-mould-europe-b2745747.html> - An article from The Independent reports that scientists warn of Aspergillus, a type of mold causing potentially deadly lung and breathing problems, spreading further across Europe due to rising temperatures. This spread could infect millions more annually, particularly impacting those with pre-existing conditions like asthma or weakened immune systems. Aspergillus fumigatus, one species, may expand its reach by 77% by 2100, potentially exposing nine million more Europeans. Another species, Aspergillus flavus, which lives on crops, is also expected to spread to new territories, including parts of north China, Russia, Scandinavia, and Alaska.