

Leading microbiologist warns of killer fungi's increasing threat

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A leading microbiologist has warned of the increasing threat that killer fungi poses to humans and the environment.

The [latest figures](#) show that fungal diseases cause hundreds of thousands of deaths annually, following severe respiratory illness and infections of the [blood stream](#).

Speaking at the University's Science in Public Health lecture series (19:00GMT, 15/01/2015), Professor Rosemary Barnes from the School of Medicine's Institute of Infection & Immunity considered what the public had to fear from killer fungi:

"For most people, [fungal disease](#) means a bit of athlete's foot or a manky-looking toe nail. These maybe irritating and unsightly but fungi can do far worse.

"Fungi kill more people than malaria and tuberculosis worldwide. They destroy about a third of all arable food crops. Some species have led to the extinction of many animal and plant species – sometimes even before the species has even been discovered.

"Fungi were on the earth long before plants and other life forms. They readily adapt to increasing globalization and climate change and we need to rise to the challenge to deal with the threats posed by these versatile and intriguing organisms."

Scientists have identified more than two million species of fungi and they are considered to be among the most diverse and adaptable of all living organisms, predating humans by hundreds of millions of years.

Only 600 species are known to cause disease and 99% of these diseases can be attributed to 30 kinds of fungi. Whilst relatively few species cause [human](#) disease, they are incredibly common with approximately one-in-three people infected.

Most infections are trivial but serious invasive diseases affect 2.5 million people worldwide. Invasive fungal disease is very difficult to treat and can be distressing for patients, causing gross disfigurement.

Other strains of fungi can decimate crops leading to billions of pounds of food wastage and contribute to global poverty.

According to Professor Barnes, recent flooding across UK and the rest of Europe has exacerbated the situation further:

"Flooding caused by adverse weather conditions has caused a worsening situation of home dampness and indoor mould growth, which are associated with asthma, rhinitis and other respiratory problems.

"Five and a half million people in the UK alone are living with asthma and half of these cases are down to an allergic reaction to fungi."

Emerging fungal diseases such as Dutch Elm, ash dieback, sweet chestnut blight and sudden oak [death](#) are also a real concern for Britain's forests, said Professor Barnes. She continued:

"Deforestation from fungal pathogens increases carbon dioxide emissions and contributes to global warming. Other diseases attack insect populations that are crucial for plant pollination.

"For example, microsporidial fungal [infection](#) contributes to colony collapse disorder that has brought a massive decline in domestic bee populations – crop yields are decreased by as much as a third when bee pollinations are affected.

"The real impact of fungus on our health, environment and economy is largely unknown because existing data is crude. This is because diagnostic techniques are suboptimal and we need to improve this and perform careful surveillance studies. Unfortunately research investment in this area is poor."

Professor Barnes is personal chair of the University's Institute of Infection & Immunity. Her research interests include infections in immunocompromised patients with particular focus in the rapid diagnosis of invasive [fungal infection](#). She heads the Regional Mycology Unit in Wales and previously chaired the steering Committee of the UK Clinical Mycology Network.

Five examples of the most lethal fungi

1. Name: Candida. Symptoms: skin and mucous infections, septicaemia. Death rate: 30-49%
2. Name: Cryptococcal disease, Symptoms: meningitis. Death rate: 70% in the developing world
3. Name: Aspergillosis. Symptoms: Cavitating lung disease, Death rate: 50-90% in the immunocompromised
4. Name: Histoplasmosis, Symptoms: lung disease. Death rate: 30% in chronic disease
5. Name: Pneumocystis. Symptoms: pneumonia. Death rate: 15-20%

Provided by Cardiff University

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