Fungicides for crops: Worrying link to fungal drug resistance in UK warns scientists

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Crop spraying on British farms could be aiding a life-threatening fungus suffered by tens of thousand of people in the UK each year.

New research by British and Dutch scientists has found that *Aspergillus* – a common fungus that attacks the lungs and is found in soil and other organic matter – has become resistant to life - saving drugs in parts of rural Yorkshire.

It's the first time a link has been made in the UK between drug resistance in *Aspergillus* and fungicide used on crops. Experts warn their findings, now published, are significant and raise serious implications for transplant patients, those with leukaemia and people who suffer from severe asthma.

In the three-year study, researchers from The University of Manchester and Radboud University, in the Netherlands, compared resistance profiles in 230 fungal samples, collected from rural areas in West Yorkshire which were treated with fungicides, to 290 air and soil samples from inner city sites across Greater Manchester.

They found no resistance from the sites in Greater Manchester compared to 1.7% resistance detected in West Yorkshire, implicating fungicide use in agriculture.

Dr Michael Bromley, Lecturer at The University of Manchester and study leader commented: "Given the frequent finding of resistance

across northern Europe, it is not a surprise to see resistance in the UK. However, the clear association with triazole fungicide usage is very worrisome, as some unlucky people at risk will breathe in untreatable *Aspergillus*, with potentially dire consequences."

Diseases caused by *Aspergillus* affect millions of people worldwide, causing high morbidity and mortality. The only oral antifungal agents (triazoles) for human use are similar in structure to certain fungicides. The use of certain compounds in agriculture, notably difenoconazole, propiconazole, epoxiconazole, bromuconazole and tebuconazol are particularly likely to lead to resistance, yet are freely used in agriculture. There is a very limited range of antifungal compounds to treat fungal diseases, and some fungi are multi-resistant.

The emerging antifungal resistance in human pathogenic fungi is causing a huge threat to patients, especially to those with weaken immune systems and this study emphasises that there may be even a greater problem in treating such diseases. Previously such resistance has been observed in a few other countries (Netherlands, Denmark, Belgium, Germany, France, India, China, Iran, Tanzania and a few others) raising great concerns among clinicians. No new classes of antifungal agent are currently in clinical development.

These findings come as the Government has announced of a review of the economics of antimicrobial research. However, experts believe current practice across both health and veterinary services is failing to prevent the inappropriate prescription of antibiotics. The Science and Technology Committee has warned that the Government needs to set clear responsibilities at all levels of the NHS and veterinary medicine to achieve better stewardship of the antimicrobial drugs vital in modern medicine.

More information: * The findings are published by the International

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Society for Chemotherapy of Infection and Cancer as Bromley MJ, et al. Occurrence of azole-resistant species of Aspergillus in the UK environment in the *Journal of Global Antimicrobial Resistance* (2014).

Provided by University of Manchester

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