

## Soil studies reveal rise in antibiotic resistance

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Antibiotic resistance in the natural environment is rising despite tighter controls over our use of antibiotics in medicine and agriculture, Newcastle University scientists have found.

Bacterial DNA extracted from soil samples collected between 1940 and 2008 has revealed a rise in background levels of antibiotic resistant genes.

Newcastle University's Professor David Graham, who led the research, said the findings suggest an emerging threat to public and environmental health in the future.

"Over the last few decades there has been growing concern about increasing <u>antibiotic resistance</u> and the threat it poses to our health, which is best evidenced by MRSA," explained Professor Graham, who is based in the School of Civil Engineering and Geosciences at Newcastle University.

"Despite increasingly stringent controls on our use of antibiotics, the background level of antibiotic resistant genes, which are markers for potential resistance, continues to rise in soils."

"This increases the chances of a resistant gene in a harmless bacteria being passed onto a disease-causing pathogen, such as a MRSA, with obvious consequences."

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*Science and Technology*, the report uses data taken from five sites in the Netherlands.

The team, which also includes Dr Charles Knapp and Dr Jan Dolfing, of Newcastle University, and Dr Phillip Ehlert, Wageningen University, in the Netherlands, found that 78 per cent of genes from four classes of antibiotics showed increasing levels since 1940 - despite continued efforts to reduce environmental levels.

Professor Graham said the next step would be to analyse <u>soil samples</u> from other parts of the world, although he expects to see similar results.

He adds: "The big question is that with more stringent European regulations and greater emphasis on conservative antibiotic use in agriculture and medicine, why are antibiotic resistant gene levels still rising?"

"Whatever the cause, this rise suggests an ever increasing risk of resistant genes being passed from environmental organisms to organisms of greater health concern."

Professor Graham contends that more complementary studies are desperately needed between environmental and public health researchers to determine whether this increasing 'pool' of resistance is actually contributing to harmful bacteria, such as MRSA.

Provided by Newcastle University

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