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Scientists show how animal diseases can jump to humans

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SCOTTISH scientists have uncovered fresh evidence of how viruses, such as flu, jump between species, and hope this could help predict the arrival of new diseases in future.

Researchers from Edinburgh University found the ability of different parasites to switch between animals and humans was linked to how closely they were related – and how susceptible they were to the type of bug making the jump.

It is hoped the fresh insight into the phenomenon – seen in illnesses such as bird and swine flu – could help predict the emergence of new diseases and allow for better planning.

The Edinburgh researchers, working with colleagues at Cambridge University, explored how relationships between species might determine the spread of a group of diseases known as RNA viruses, which includes HIV, flu and Sars.

The team infected more than 50 different species of flies with different viruses. This revealed that species of fly which were closely related to a virus's usual target species were more susceptible to the infections than distantly related flies and groups of flies that were closely related were similarly susceptible to the same viruses.

The results also suggest that when diseases make the leap to a distant species – such as bird flu infecting humans – they may then spread easily in species closely related to the new victim, regardless of how closely related these are to the original target species.

Lead researcher Dr Ben Longdon, from the University of Edinburgh's School of Biological Sciences, said: "Emerging diseases such as Sars, HIV and some types of flu have all got into humans from other species. Understanding how diseases jump between different species is essential if we want to predict the appearance of new diseases in the future."

Dr Longdon said his team wanted to try to understand the reasons why parasites jumped between different host species to give clues about how to predict future threats .

For example, the findings suggested that a parasite which naturally infects a chimp would be more likely to infect humans than one that affects a cat.

"That would mean that parasites are able to make jumps between distantly related species because one group is particularly susceptible," said Dr London. "This effect might explain why bird flu has made the leap to infect humans, because humans may be susceptible to this type of flu making it easier to jump the species barrier when people are in close contact to birds, even though they are not closely related.

Dr Longdon added future research must also examine species which humans regularly came into contact with, because while chimps are closely related, most people do not have close contact with them.

"We come into contact with plants a lot, and they are full of viruses. If you have a salad for lunch, it will be full of different types of plant viruses. But you are very unlikely to catch those viruses because we are very different to plants," he said.

"But if we were eating something that was more closely related to us, that might be the source of a new emerging disease."

Dr John Cowden, from Health Protection Scotland, said: "Any research which extends our knowledge of this phenomenon could be very valuable."

LEAP OF FAITH TO FIND A CURE

IN RECENT years, several viruses have made the jump from animals into human – often with devastating consequences.

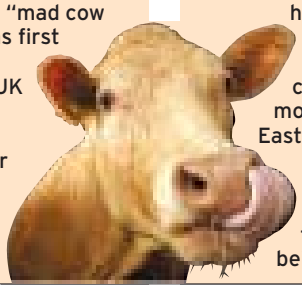
Bovine spongiform encephalopathy (BSE) – often called "mad cow disease" – was first identified in cattle in the UK in 1986.

It only emerged later that the disease posed a risk to humans.

If someone eats diseased tissue from cattle, they may develop the human form of the disease. More than 170 people in the UK have fallen victim to the fatal disease.

Cases of H5N1 bird flu have also been reported in humans in close contact with birds, mostly in the Far East.

Swine flu was identified in 2009 in Mexico leading to a pandemic being declared.



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