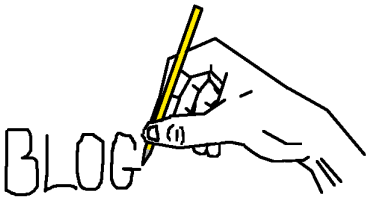


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# Tracking *M. bovis* transmission between cattle and badgers using genomics 16-12-18

Today, after a huge amount of work over many years, our research using genomics to look at how often *Mycobacterium bovis* was transmitted between cattle and badgers in Woodchester Park has been published!

Take a look at the article **here**!

*Mycobacterium bovis* causes bovine tuberculosis in cattle and it costs the UK goverment tens of millions of pounds every year to control.

*Mycobacterium bovis* can infect many different species other than cattle. In fact, in the UK, badger populations are thought to often be infected. A lot of research has found that infection can spread between cattle and badgers.

Woodchester Park, shown below, is a reserve in the south west of England. In this park there is a mixture of fertile farmland pasture, woodland and small ponds - the perfect place for a badger to live!


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A couple of hundred badgers live in Woodchester Park, they live in small social groups containing 5-8 badgers. There are also cattle that graze on the fields in and around the park.

The south west of England has the highest levels of bovine tuberculosis in cattle in the country. Many people think that part of the reason for this is that badgers are found in large numbers here.

Our research used samples of *Mycobacterium bovis* bacteria sourced from infected cattle and badgers living in and around Woodchester Park for about 10 years.

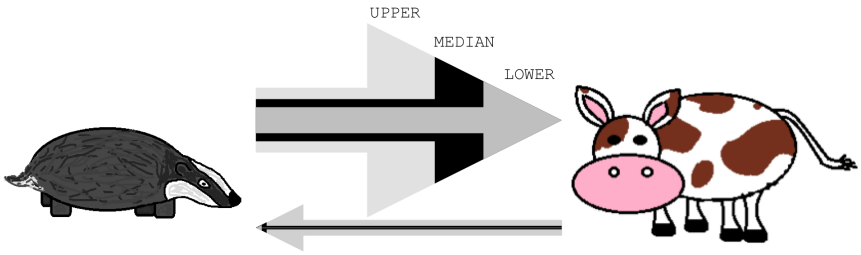
We used whole genome sequencing to generate the genomes of these bacteria. By comparing the genomes of the bacteria infecting badgers to those infecting cattle we were able to investigate whether badgers were transmitting infection to cattle or not.

We found that the badgers and cattle were infected with very similar strains of the *Mycobacterium bovis* bacteria, sometimes even the exact same strain! This meant that infection was being transmitted between the badgers and cattle, and it must have been happening quite frequently.

But who was giving it to whom?

To estimate how often infection was transmitted from

cattle to badgers, and in the other direction, we used a tool called **BASTA**.




As the diagram above shows, we found that most of our analyses estimated that badgers were transmitting infection to cattle more frequently.

We looked into the transmission rates further and we found that badgers were more likely to infect other badgers and cattle were more likely to infect other cattle. That means that transmission occurred more frequently between animals of the same species.

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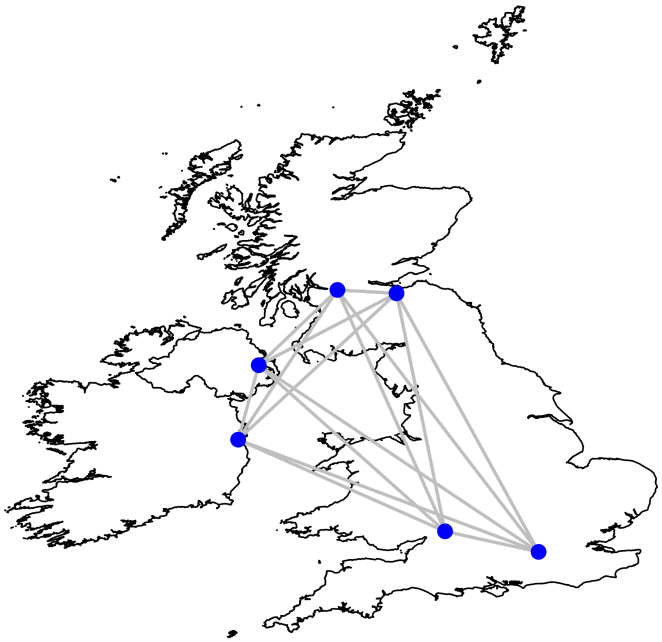

Our research relied upon a very large collaboration between institutions across the United Kingdom and Republic of Ireland. The main institutions involved were the University of Glasgow, University of Edinburgh, University College Dublin, Agri-Food and Biosciences Institute, the National Wildlife Management Centre and

Institute, the National Wildlife Management Centre and the Animal & Plant Health Agency. Some of the most important things we learnt in our research were:

- *Mycobacterium bovis* can be transmitted between cattle and badgers
- In Woodchester Park, transmission appears to occur more frequently from badgers to cattle
- Whole genome sequencing is enabling us to investigate transmission at a resolution that was never possible before!

**It is extremely important to note that our study only looked at data from Woodchester Park, a small area in the South West of England. Without further research, we don't know if what we found here is true elsewhere. We are currently investigating transmission in other areas.**

So that is just a brief peak at our analyses, take a look at the **paper** and read about all the other interesting analyses we did!

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