Answering key questions around One Health antimicrobial resistance using a new livestock research data platform

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Project description:

Antimicrobial resistance (AMR) is becoming an increasingly important topic worldwide, and veterinary medicines use - particularly in the agricultural sector - has come under sustained scrutiny. Growing political pressure to reform and reduce antimicrobial use in order to stem the tide of AMR continues to build, although methods of collecting and analysing data are far behind demand. Through interdisciplinary collaborations, we are creating a surveillance system and research data platform for UK-wide recording of medicines use, disease prevalence and AMR in the cattle sector, as well as elucidating its relationship with companion animal and human resistance. This initiative has generated substantial buy-in from government and the livestock and food industries. We have already gained access to the complete veterinary records and clinical notes from large commercial livestock veterinary practices, have extracted data from practice management systems of >50% of all cattle in the UK and have included laboratory diagnostics as well as antibiotic susceptibility for thousands of isolates and whole genome sequencing.

The objective of this studentship is to exploit these data through application of epidemiology and infection modelling to extract new biological understanding about the development and transmission of AMR. Challenges here include, through industry engagement and supervision, the rationalisation of stakeholder requirements with the inferential capacity of the databank. Timely questions of ownership and sharing of data between farmers, veterinarians, the industry and government will be explored using social science techniques which will help inform all stakeholders currently interested in and are using these types of data. Good governance practices will be established and communicated widely. Validated methods will then be incorporated back into our real-time surveillance platform, together with dashboards and visualisations for farmers, veterinarians and industry which will be co-created alongside these stakeholders. Engagement of the industry will be paramount at all times. This student will underpin the data-driven economy in this sector, adding knowledge to veterinarian prescribing practice, farm management practice and the development of supply chain and government antimicrobial stewardship policies.