

Persistence of bovine tuberculosis within cattle herds in Great Britain

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The number of new breakdowns of bovine tuberculosis (bTB) in cattle herds in Great Britain (GB) has increased by 18% on average per year since the mid-1980s. The disease carries a high economic impact with approximately £80 million spent in 2007 on disease control. Many studies have been undertaken to try to identify risk factors for herds suffering bTB breakdowns, though few have looked at risk factors for *persistence* of bTB after it has been introduced to a herd. Persistence can be quantified in terms of herds which fail to clear infection (*'prolonged'* breakdowns), or have persistent undetected infection or an increased likelihood of re-infection (*'recurrent'* breakdowns). Identification of herds with a high risk of persistence is of particular interest since they may act as a focus of bTB spread.

Data available from a detailed herd-level case-control study have been analysed to assess the impact of herd-level management characteristics on the incidence of *'prolonged'* bTB breakdowns. A novel approach has been taken re-classifying the original breakdown herds into *'prolonged'* and *'non-prolonged'* breakdown herds. The data were analysed by a logistic regression model in order to quantify the effect of different risk factors and the model has been shown to have excellent discriminatory power when tested on the dataset used to form the model (Area under the Receiver Operating Characteristic curve = 0.86). This predictive ability is currently being tested on independent datasets.

The work is being extended further by conducting a case-control study to identify risk factors for *'recurrence'* of bTB at the herd level, in terms of repeated breakdowns within a specified period of time, with a similar analytical approach being taken. Identification of risk factors together with the ability to predict which herds are more likely to suffer a prolonged or recurrent breakdown in the future could be a valuable tool for altering the management of these herds and targeting intensive bTB controls. Persistence of bTB will also be explored at the individual animal-level, examining whether abnormal skin test reactions may be masking underlying infection.

Examining persistence at both the herd-level and at the individual-animal level will improve the understanding of persistence of bTB within cattle herds in GB and contribute to improving current control policies.