

# OF BOVINE TUBERCULOSIS IN TWO REGIONS OF GB

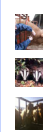
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## INTRODUCTION

The rising incidence of bovine tuberculosis (bTB) in Great Britain (GB) presents an ongoing burden on the agricultural industry and the government in terms of animal health and welfare, and the agricultural economy (Defra, 2005). This study describes and reviews the circumstances surrounding the recent emergence of bTB in 13 parishes of East Carmarthenshire (720km<sup>2</sup>) and 19 parishes of South West Cumbria (500km<sup>2</sup>). The aim is to identify risk factors and/or circumstances which could have contributed to the differing outcomes observed in these regions, and may be predictive of current 'clean' areas at risk of bTB establishment.

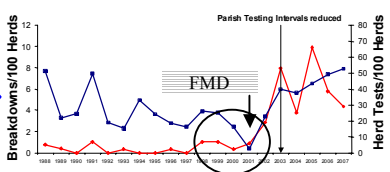
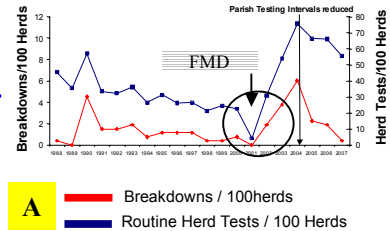
## DATA SOURCES



- Disease surveillance database: VETNET
- Cattle Tracing System (CTS)
- Cumbria Road Traffic Accident survey 2004
- Welsh Found Dead badger survey 2005-6
- Individual Herd Reactor Files

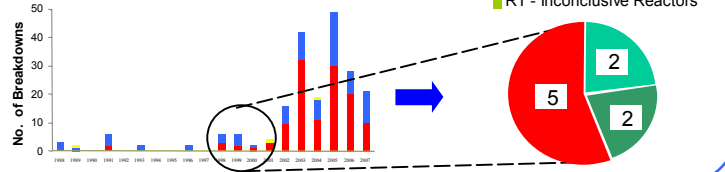
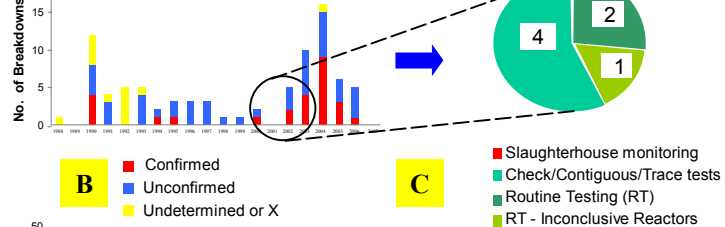
## TESTING AND BREAKDOWN HISTORY

19 Parishes,  
South-West  
Cumbria



## CONFIRMED BREAKDOWN DISCLOSURE IN THE 'EMERGENCE PERIOD'

Note: Scale differences



## CONTROL

During the 'Emergence period' (defined as a four-year period following the first confirmed bTB breakdown in >4years) there were a greater number of routine herd tests per 100 herds undertaken in the Cumbria study area compared with the East Carmarthenshire study area. The method of disclosure of the confirmed 'early bTB breakdowns' (ringed in **A** & **B**) is illustrated in **C** and shows that in Cumbria over half of these confirmed breakdowns were disclosed by proactive bTB testing initiated in response to breakdown disclosure in this area. In contrast, meat inspection, which is recognised as less sensitive than skin testing (Corner et al., 1990), identified over half of the confirmed breakdowns in the 'emergence period' of the East Carmarthenshire study area. In both study areas the Parish Testing Intervals were not changed until after this 'emergence period'.

## SOURCE OF INFECTION

Thanks to the availability of herd breakdown histories, cattle movement data and genotyping of *Mycobacterium bovis* strains, bTB breakdowns caused by long-distance cattle movements between herds can be ascribed with more certainty than those resulting from cattle movements between CTS-linked holdings or a local wildlife source.

In both study areas, three of the 'emergence breakdowns' could be attributed to purchased cattle. **E** shows that the majority of movements 'in' are within county. **F** illustrates the close proximity of the Carmarthenshire study area to high bTB incidence areas to the West and East. The risk of bTB exposure via cattle movements 'in' for this area will be greater than in the Cumbria study area, which is geographically isolated.

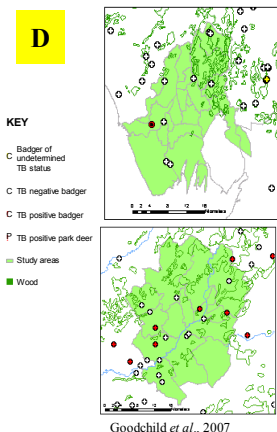
The highest frequency cattle movements in both study areas are short distance and likely represent both local sales and transient 'within herd' movements between multiple land parcels. These can be dispersed within and between parishes and result in large numbers of potentially contiguous herds which can be challenging to accurately identify. In addition, unrecorded local movements may also contribute to the amplification of disease in a small area.

The disclosure of bTB in the badger population (**D**) in 2004 and the subsequent persistence of bTB in the East Carmarthenshire study area supports the hypothesis that badger activity on/near farmland is a key source of infection there, although the direction and frequency of transmission remains unclear. By contrast, bTB was not identified in the 7 badgers collected in the SW Cumbria study area. An infected herd of park deer in this study area was considered the origin of infection, responsible for 4/7 'emergence breakdowns'. The incidence of confirmed breakdowns in SW Cumbria has declined year on year following the implementation of annual testing in the area and the eventual culling of the infected deer herd early in 2006.

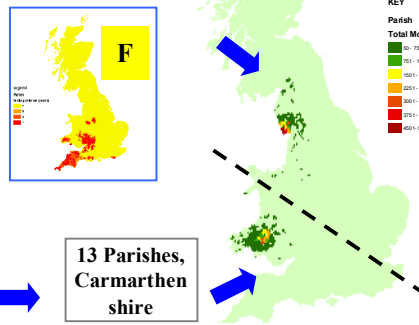
## bTB IN NON-BOVINE POPULATIONS

## CATTLE MOVEMENTS

SOURCES 'IN' TO STUDY AREAS Based on CTS data 2002-2006



19 Parishes,  
Cumbria



13 Parishes,  
Carmarthen  
shire

## CONCLUDING REMARKS

Routine bTB testing intervals are determined by historical bTB herd incidence in each parish and by individual herd risk. Long test intervals reduce the likelihood of infection disclosure by herd testing and bTB surveillance becomes more reliant upon slaughterhouse inspection, a cheaper but less sensitive technique. Furthermore, herd testing interval determines eligibility for pre-movement TB testing (PrMT). This study supports the implementation of PrMT (introduced in March 2006) and the additional measures adopted for the identification of potential new TB 'hotspots' (Defra, 2005). The study also suggests that the persistence or elimination of new TB hotspots is highly dependent on the prevailing local epidemiological risk factors such as the establishment (or not) of TB infection in a wildlife maintenance host.

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