Longer-term risk of *Mycobacterium bovis* in Irish cattle inconclusive reactor to the single intradermal comparative tuberculin test

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In Ireland, new bovine tuberculosis (bTB) cases are detected by field and abattoir surveillance. During field surveillance, an animal is a ‘standard inconclusive reactor’ (SIR) to the single intradermal comparative tuberculin test (SICTT) if the bovine response is >2 mm, and 1-4 mm > the avian response. Little is known about the future infection risk posed by transient SIR (TIR) animals (SIR animals that pass a subsequent test). We critically evaluate the future bTB status of TIR animals, by examining the future risk of bTB diagnosis over the 4 years following initial SIR diagnosis and clearance at the subsequent retest. The study included all TIRs initially identified as SIRs in 2005 in otherwise free herds at tests with no other reactors. The analysis is restricted to cows that did not leave the herd, other than direct to slaughter, to the end of 2009. Five control cows were randomly selected from each study herd. A parametric survival model with shared frailties, to account for clustering within herds, was developed to model time from passing a retest to future bTB diagnosis. The final parametric survival model contained the variables: TIR status in 2005, inconclusive status during the follow-up period, location, herd restricted during the study, time since last restriction within the herd and age. The time ratio for the TIR status variable was significant (P<0.001) indicating that on average the time to diagnosis with bTB for TIRs was 78% shorter compared to the non-TIRs. The frailty term was significant (P<0.001) indicating that animals within some herds were more likely to become reactors compared to other herds. These results have important implications for national policy and future management of TIR animals.