THE CAMBRIDGE STATISTICS DISCUSSION GROUP

Tuesday 11th October 2011 7:15 for 7:45

Large Lecture Theatre,
MRC Cognition and Brain Sciences Unit,
Chaucer Road, Cambridge, CB2 7EF

Persistence and the control of bovine tuberculosis in Great Britain

Andrew Conlan
Cambridge Infectious Diseases Consortium

Abstract: Bovine tuberculosis (bTB) is a chronic infectious disease of livestock. Recent research on bTB has focused on understanding the relative roles of cattle-movements and wildlife in inter-herd transmission. However, control of bTB is based on a tuberculin skin test with imperfect sensitivity and specificity; additionally, there is an occult period where cattle are infected but not detectable. There is evidence of persistence of bTB in GB cattle herds through high rates of recurrence and a high proportion of prolonged incidents. We set out to quantify the level of occult bTB infection within GB herds and its role in recurrence. We estimate herd-level persistence through measures related to the duration and probability of recurrence of bTB incidents. The development of models of childhood infectious diseases has been informed by studies of their natural stochastic persistence, but less work has focussed on the stochastic persistence of chronic disease under intensive surveillance. We examine the relative importance of within-herd persistence and re-introduction of infection using a parsimonious herd level model of bTB that provides a mechanistic simulation of the dynamics of transmission and testing using only 12 parameters. We use an Approximate Bayesian Computation (ABC) framework to parameterise our model, generating predictive distributions consistent with our empirical measures of persistence. We present a framework with which to rigorously estimate parameters relating to within-herd transmission of bTB and the efficiency of the tuberculin test that have proved difficult or impossible to estimate by other means. Our results suggest that recurrence is driven by re-introduction. Improvement of herd-level control of bTB cannot therefore reduce the probability of breakdowns recurring unless the rate of inter-herd transmission is reduced.

Speaker: Andrew Conlan is a research associate with the Cambridge Infectious Diseases Consortium, based at the Department of Veterinary Medicine in Cambridge. Andrew graduated in Mathematical Physics from the University of Edinburgh and undertook a PhD in the Department of Zoology in Cambridge in 2002 with Bryan Grenfell. He has remained in Cambridge since then furthering his research on disease dynamics in the Department of Applied Mathematics (DAMTP) and the Department of Veterinary Medicine. His research has focused on understanding the stochastic persistence of infectious diseases, ranging from childhood infectious diseases, to bacterial infections in livestock. He has particular interests in measles, pertussis, scarlet fever, diptheria, campylobacter and bovine tuberculosis.

Annual General Meeting: Andrew's talk will be preceded by a brief Annual General Meeting.

Directions: Chaucer Road is off Trumpington Road – if you are heading away from the city centre it is the first right after the junction with Brooklands Avenue. Number 15 is at the end on the left and is a large Victorian House with a more modern extension to its right. The entrance is in the porch located in the middle of the older section on the left as you come in and is accessed by ascending a few steps from the car park. Cars may be parked there. The outside door will be locked at 7:45. Arrivals after 7:45pm can gain admittance by contacting the secretary on 07761769436. A map showing the location of the unit is at http://www.mrc-cbu.cam.ac.uk/contacts/directions.

Provisional Next Meetings:
28th November – Tim Eisen (Cambridge Cancer Centre).
2nd February 2012 – Nelson Kinnersley (Roche UK).
15th March – David Daniels (Perse School) on 'Mathematics at the Perse School'.
3rd April – Lawrence Sherman (Institute of Criminology).
Supper: Some members eat before a talk at the University Centre meeting in the downstairs bar at **5-45pm**. All welcome !
Secretary: Peter Watson, MRC Cognition and Brain Sciences Unit, 15 Chaucer Road, Cambridge CB2 7EF;
telephone 01223 355294 Extension 801; E-mail peter.watson@mrc-cbu.cam.ac.uk
For security purposes could you please let Peter Watson know if you intend attending the talk.
Take a look at our website: http://www.mrc-cbu.cam.ac.uk/people/peter.watson/csdg.html

TURN OVER for the Annual General Meeting agenda

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Chaucer Road, Cambridge

Annual General Meeting

The annual general meeting will be followed immediately by Andrew's talk 'Persistence and the control of bovine tuberculosis in Great Britain'.

Agenda:

0. Approval of Minutes of previous A.G.M.
(http://imaging.mrc-cbu.cam.ac.uk/statswiki/csdg/newtalks)

1. Treasurer's Report.

2. Secretary's Report.

3. Election of Chairman, Secretary, Treasurer, plus 3 other members of the Committee.

4. Any Other Business.

Rules for Election:

1. FRANCISE: All paid-up members may vote or stand for office.

2. NOMINATIONS: The offices to be filled are Chairman, Secretary and Treasurer and three other members of the Committee.

An outgoing Chairman will be a member of the Committee ex officio. At the end of each year the entire Committee will stand down, but may stand again for the same office as they are leaving without nomination. To be elected to a different office a candidate must be nominated by one person from the paid-up membership, not including himself. Nominations do not require a seconder to be valid, but do require the consent of the nominee. One person can be nominated for more than one office, but hold only one. If a person is elected to a higher office (according to the ordering given below) he or she automatically ceases to be a candidate for a lower office. A candidate for the post of Chairman, Secretary, Treasurer is automatically a candidate for the Committee if he or she fails to gain election to one of these three posts.

TURN OVER for directions to the Cognition and Brain Sciences Unit and abstract of Andrew's talk