Sheep scab
- Sheep scab is one of the top 5 sheep diseases in Scotland (financial and welfare perspectives)
- Endemic in UK – costs ~£9 million/year for control alone
- ~10 – 15% of Scottish sheep farms experience sheep scab in any one year
- Notifiable in Scotland since 2010 (Sheep Scab Order (Scotland))
- Current understanding of within-flock transmission of sheep scab is limited, hindering effective control planning.

Diagnostic test
- Researchers at Moredun have developed new methods of diagnosis and control for sheep scab.
- They established a diagnostic test which successfully identifies infection at the subclinical stage and are currently developing vaccines.
- Deploying a vaccine most effectively requires an understanding of the transmission dynamics of sheep scab.
- In EPIC Topic 4 we use outbreak data currently held at Moredun to develop and parameterise models of sheep scab spread, which will help to inform the delivery of interventions.

Mathematical modelling
- We aim to achieve an improved understanding of the transmission dynamics of sheep scab.
- We are developing a stochastic transmission model for the spread of sheep scab relating
  - Multiple key biomarkers
    - immune response
  - acute phase proteins
  - Infectivity of infected animals
- The transmission model captures the dynamics of infection within a flock.

Current work
- We are developing transmission models using data from transmission experiments in penned trials.
- Penned trial data will be build into the sheep scab model.
- The model will be validated against the natural outbreak.
- The final model will be validated with data from penned trials and used to determine the vaccine efficacy required to have a significant impact on disease control.

More on Sheep Scab
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Moredun penned trials
- Data on sheep scab transmission is currently being collected.
- Naïve animals are co-housed on a 1:1 basis with infested animals (pens (~2x3m))
- Weekly serological analysis (MRI sheep scab ELISA)
- Assessment of time required for naïve animals to exhibit clinical disease

Find out more at http://www.epicscotland.org
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