FMDV in African Buffalo
Influence of immunity in the spread of wildlife diseases

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Foot and Mouth Disease (FMD)

- Highly infectious disease on cloven-hoofed animals.
- Severe implications on animal farms (slaughter of infected animals).
- African buffalo act as maintenance host.
- Three main serotypes in South Africa (SAT1, SAT2, SAT3).
- Efforts of containment and control are constant and of high priority in some countries.

Foot and Mouth Disease (FMD)

- Population based models for cattle.
- Transmission mechanisms in buffalo are not fully understood.
- Persistence of the disease is high in buffalo, despite of being highly contagious.
- Immunity of individuals may be a factor for prevalence.
- Individual-based modeling needs to be address to include immunity.
- Loss and gain of antibodies among different serotypes may provide an explanation for persistence of FMD in African Buffalo.

Model diagram

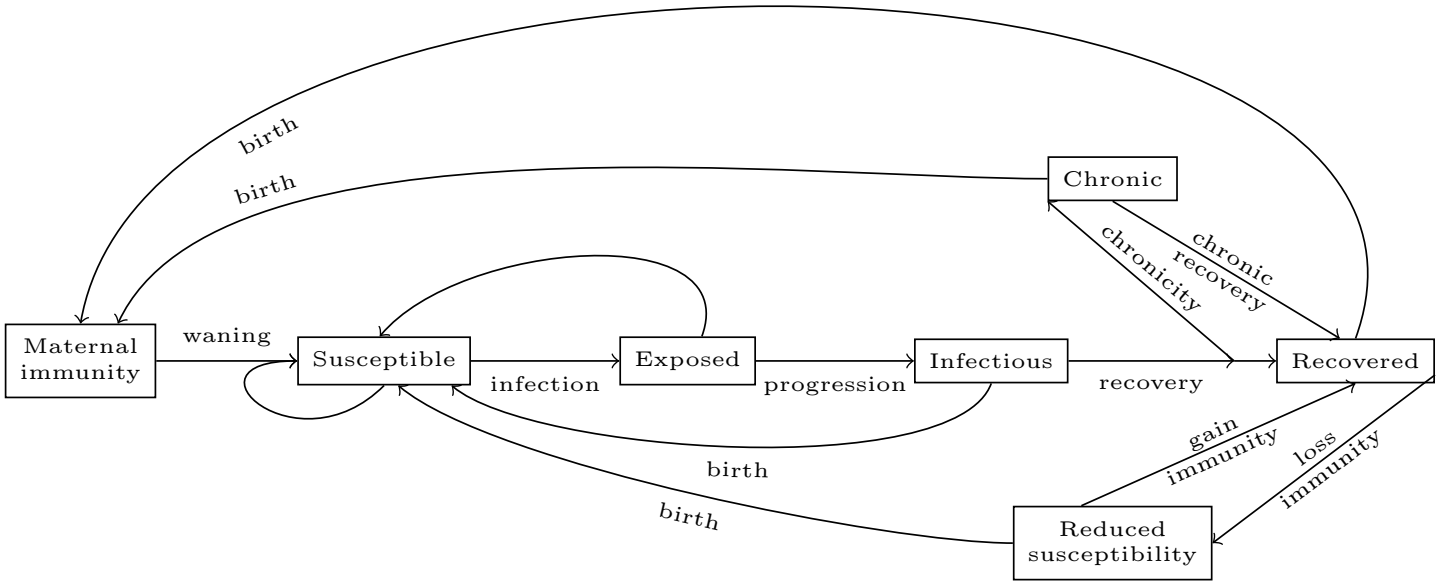

Figure: Model diagram (Death from each state is not shown)

- Cohort study of about 70 buffaloes.
- Measurements for antibodies on the three main serotypes have been collected.
- Implementation of stochastic individual-based model to capture the dynamics of FMD in African buffalo.
- Estimation of corresponding parameters will be implemented using both MLE (point estimation) and later Bayesian estimation (distribution estimation).
- Incorporation of seasonality may be possible.