Research to increase preparedness for disease outbreaks

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What we want....
What we usually have...

Data/sample collection while fighting an outbreak

- Need to know/nice to know?
- Priorities at different stages of the outbreak?
- Some information must be available beforehand
- Resources needed?
- Data quality…
Full simulation models

- Complex
- Non-obtainable data…
- Difficult to convey uncertainty
- Not enough data in outbreak situations?
- Most useful for testing strategies beforehand

Present and future work

- Disease modelling (simulation, hydrological and meteorological)
- Evaluation of eradication efforts
- Salmonella epidemiology (sampling strategies, risk factors etc)
- Biosecurity studies
- Application of microbial ecology
SLU-SVA-LiU: Strengthening the scientific basis for veterinary disease preparedness

- Between-farm contacts
- Mathematical models
- Farmers’ attitudes

Between-farm contacts

- Animals
- Professionals (veterinarians, AI technicians, hoof-trimmers etc)
Data collection

- Frequency of contacts
- Type of contacts
- Biosecurity routines

Some results

- Frequency of animal contacts associated with size and type of herd
- Veterinarians and AI technicians better biosecurity than e.g. salespeople and machine technicians
Mathematical work

- Analysis of livestock networks – algorithm to estimate probabilities of future contacts
- Transport routes
- Frequency and weight of different contacts – simulation model
- Test intervention strategies in different situations

\[
P(v, R, K, c, s) = \prod_{j=1}^{N} P\left(\theta_{j} | v, R, R, c, s\right) P\left(\theta_{j} | v, R, R, c, s\right)^{r_{j}} = P(v)
\]

Some results

- Herd characteristics affect estimated probability of contact
- Some tools that allow for simulation
- Data quality is essential!
Farmers’ attitudes

• Methods from social science
• Focus group study with livestock farmers
• Attitudes towards biosecurity, who do they listen to?

Expected usefulness

• Direct basis for preventive work
• Useful for information activities in outbreak situations
• Long-term contingency planning