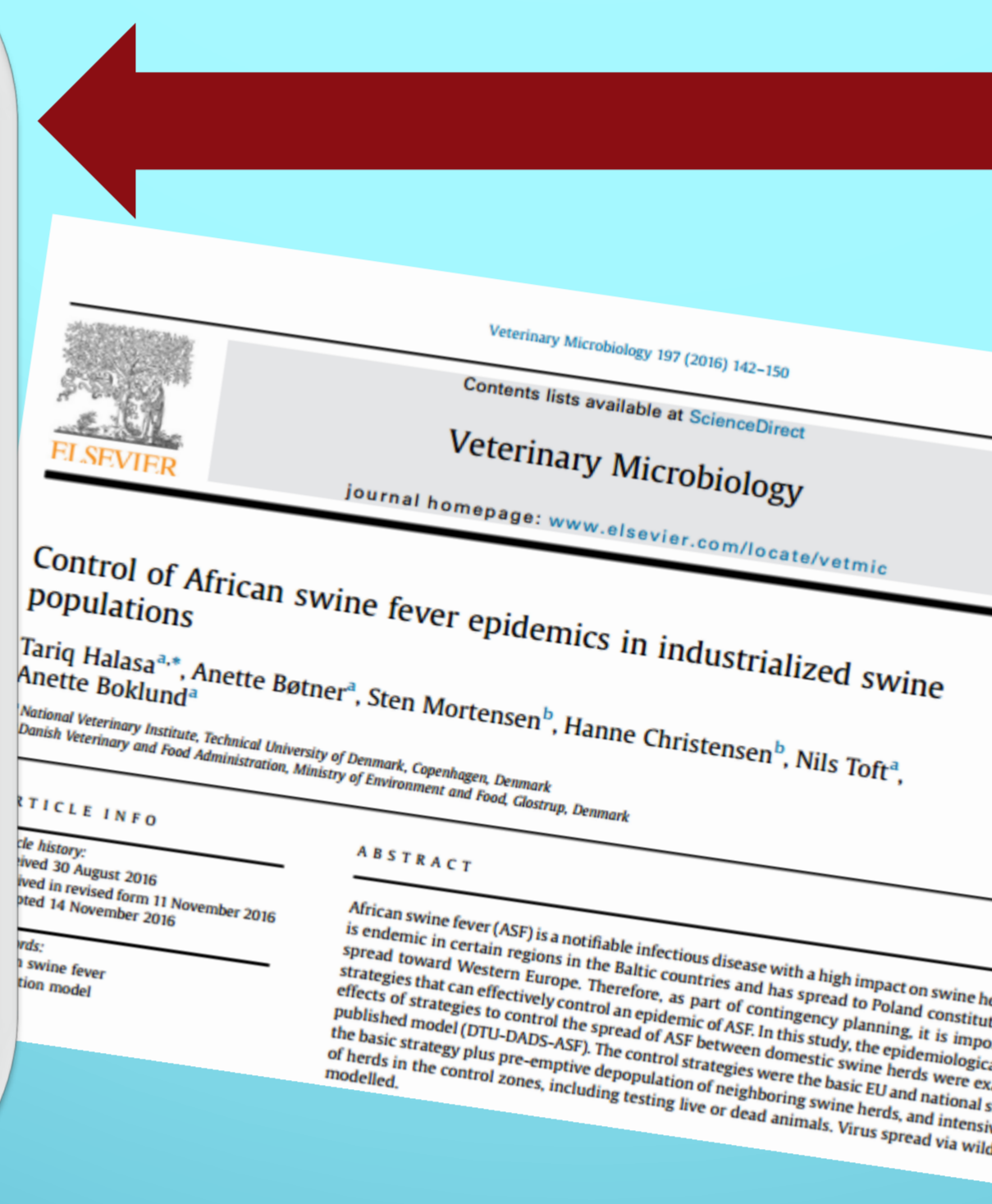# Comparing control strategies in simulated ASF epidemics

T. Halasa[1], A.Bøtner[2], S. Mortensen[3], H. Christensen[3], H.-H.Thulke[4], N.Toft[1], A. Boklund[1]

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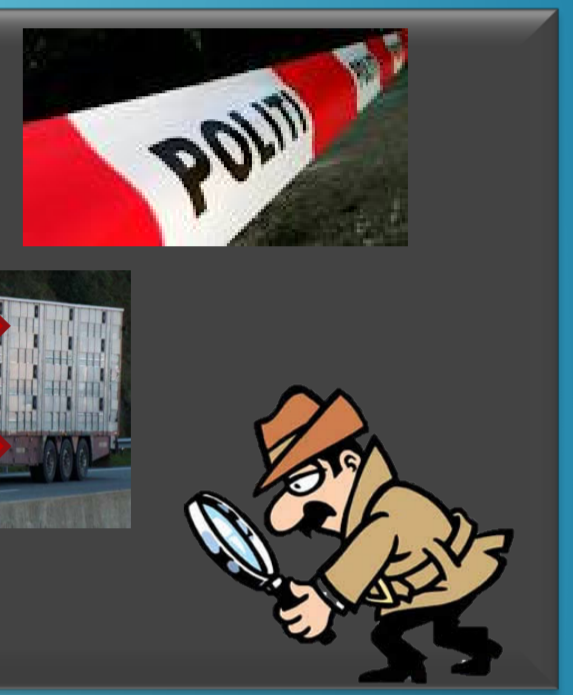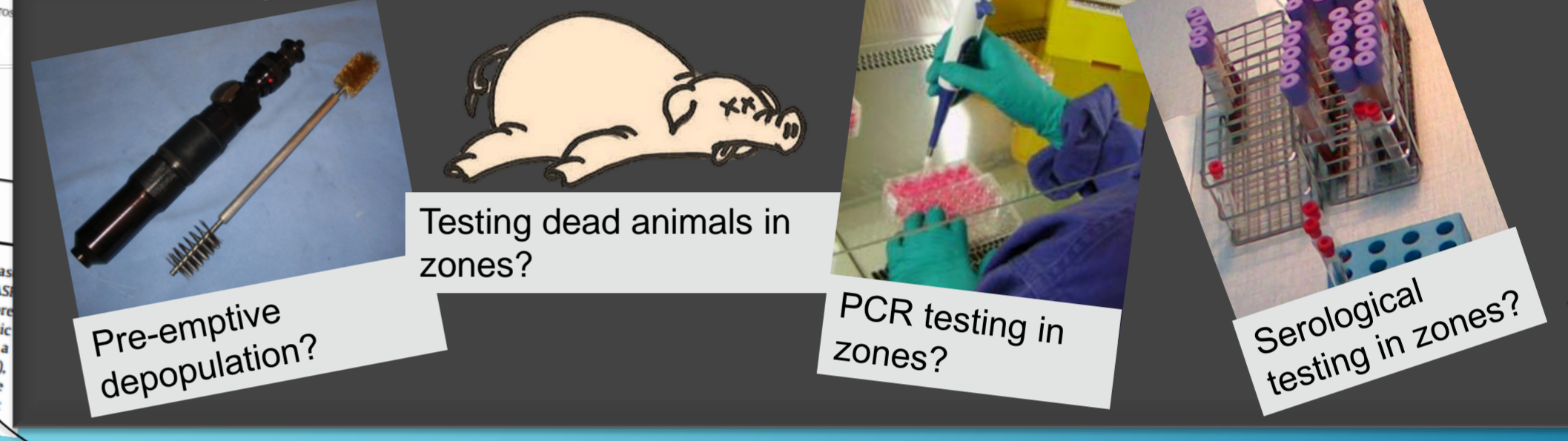## Comparing control strategies:

Basic?
- Detected herds: Cull+clean+desinfect
- 3-day national standstill
- 3km PZ + 10km SZ
    - movement restrictions + surveillance
- Tracing contacts

Or adding?

Pre-emptive depopulation?

Testing dead animals in zones?

PCR testing in zones?

Serological testing in zones?

Results:

- *PCR and serological **surveillance** of **dead animals** decreased the duration and costs of simulated ASF-outbreaks in Denmark*
- *Duration was reduced from 21 (1-55) to 9 (1-39) days*
- *Costs were reduced from 326 (256-442) to 294 (257-392) € million*
- *Export losses were the driving force of the total costs of the epidemic*

Modelling spread of ASF between domestic pig herds

Local spread in 2km
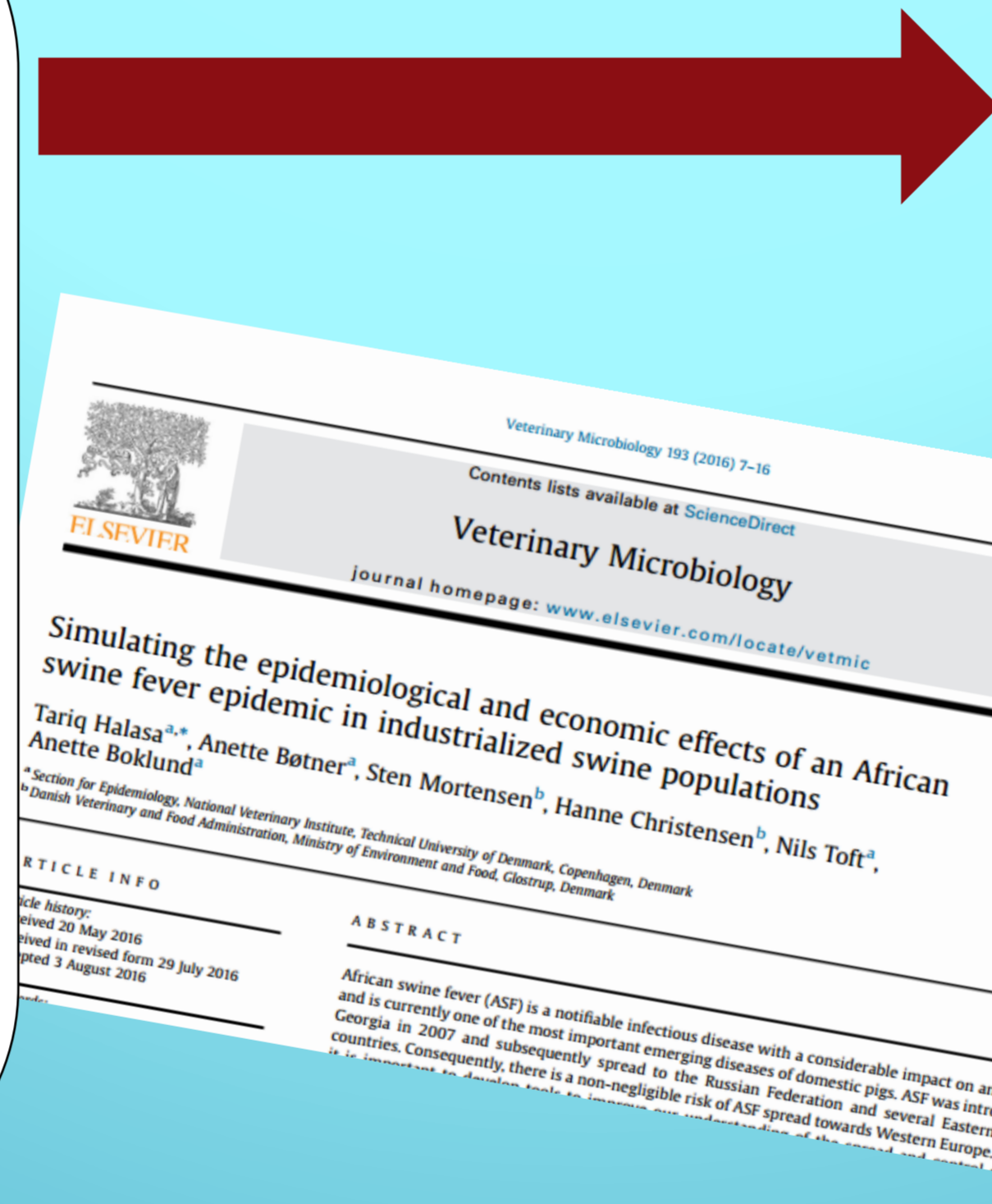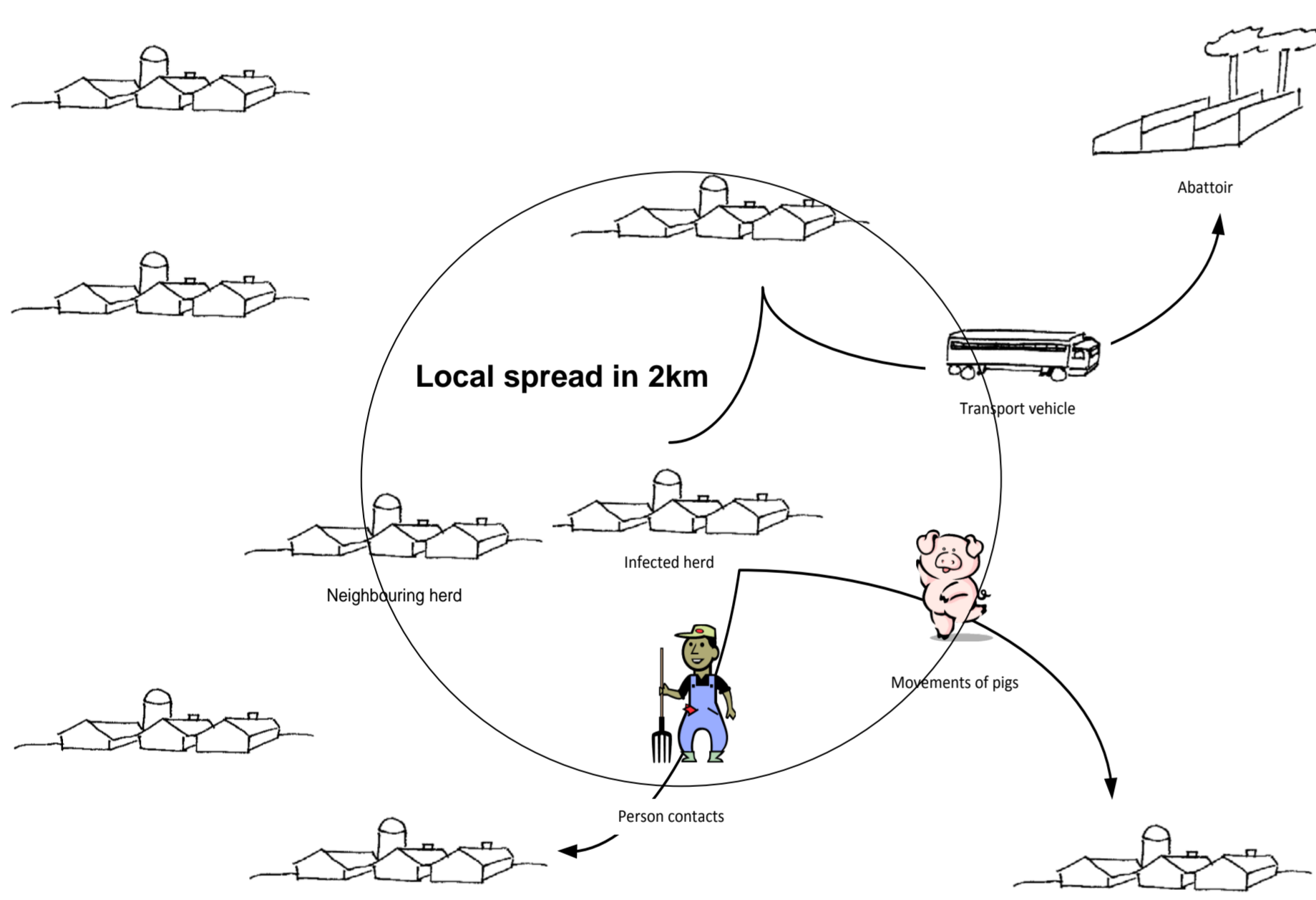
Results:

- *Small epidemics predicted (median and 5-95%)*
  - *Infected herds: 4 (1-10)*
  - *Duration: 24 days (1-75)*
  - *Total costs & losses: 340 (258-526) mill·€*
- *Some cases dies out in the first infected herd, without spread to other herds*

Results:

- *Disease may fade out in a herd without a major outbreak*
- *Spread depends on*
  - *Infectiousness of sub-clinical animals*
  - *Residues of dead animals*
  - *Transmission rate of ASF-strain*
  - *Size of pig unit*

Modelling spread of ASF within a domestic pig herd

ASF - within herd spread

Susceptible → Latent → SubClinical → Clinical → Removed
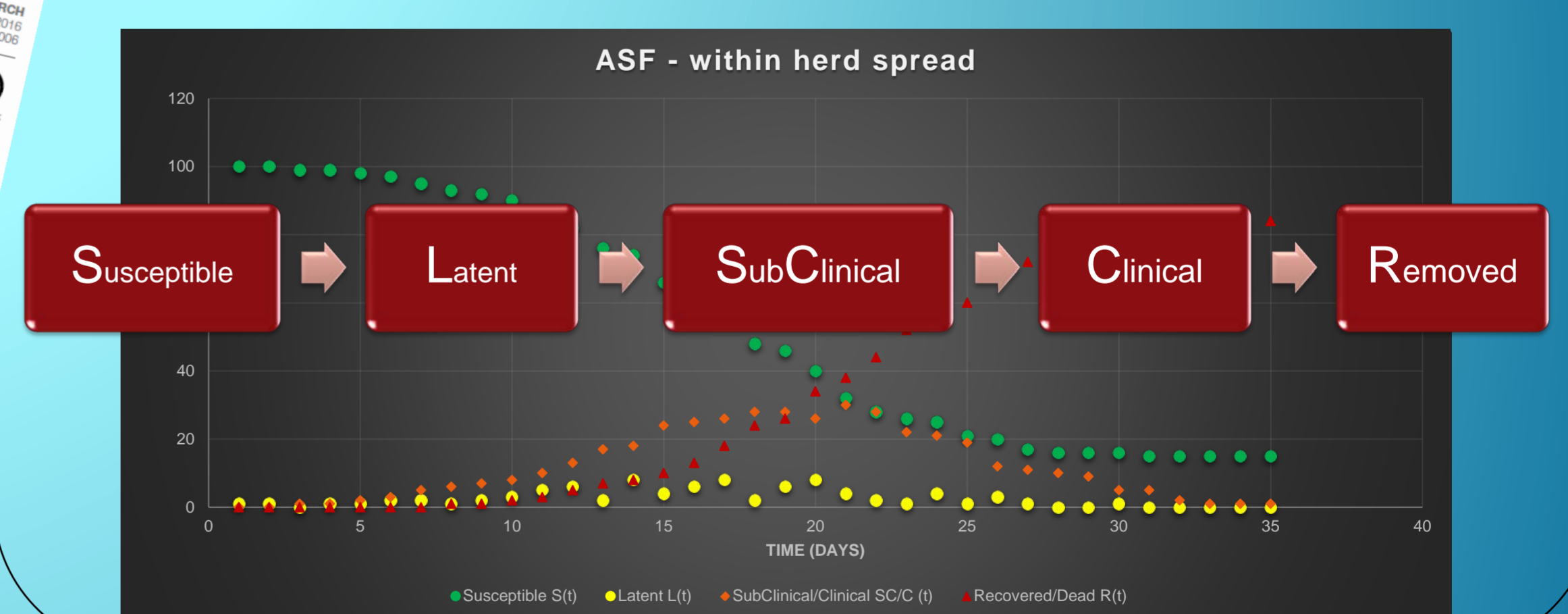
Materials and methods:

- *The Georgian virus strain of ASF was modelled. In the within-herd model, random mixing was assumed, and residues from dead animals contributed to the spread of disease within the herd. For the between-herds spread, data on Danish herds was used for herd locations, herd sizes, herd types, and movement between herds. All epidemics were inititated in sow herds and the model was run in 2000 iterations. A basic scenario was run, including the following control meassures: culling detected herds, backwards and forward tracing of contacts, creation of protection and surveillance zones in which movement restrictions and surveillance was applied, and national stand-still for all swine movements in Denmark applied from detection of the first case and three days forward. No wild boar population was included.*

- *The model is programmed in the freeware R (version 3·1·3) and is available for free use and can be obtained from (https://github.com/THalasa/DTU-DADS-ASF).*

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