Simulating the epidemiological and economic effects of an African Swine fever epidemic in Denmark

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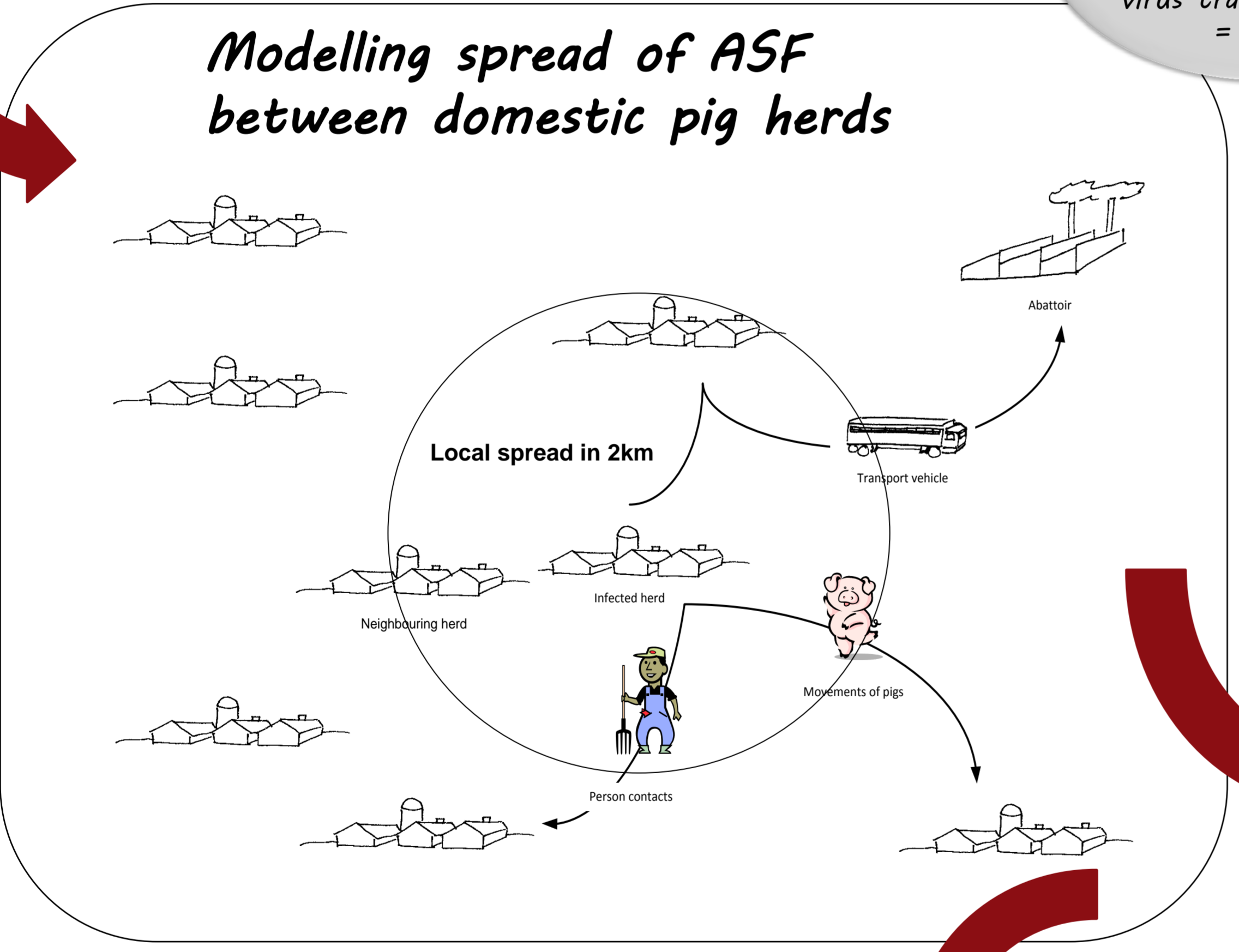4 The Danish Veterinary and Food Administration, Head Office, Denmark

Modelling spread of ASF within a domestic pig herd
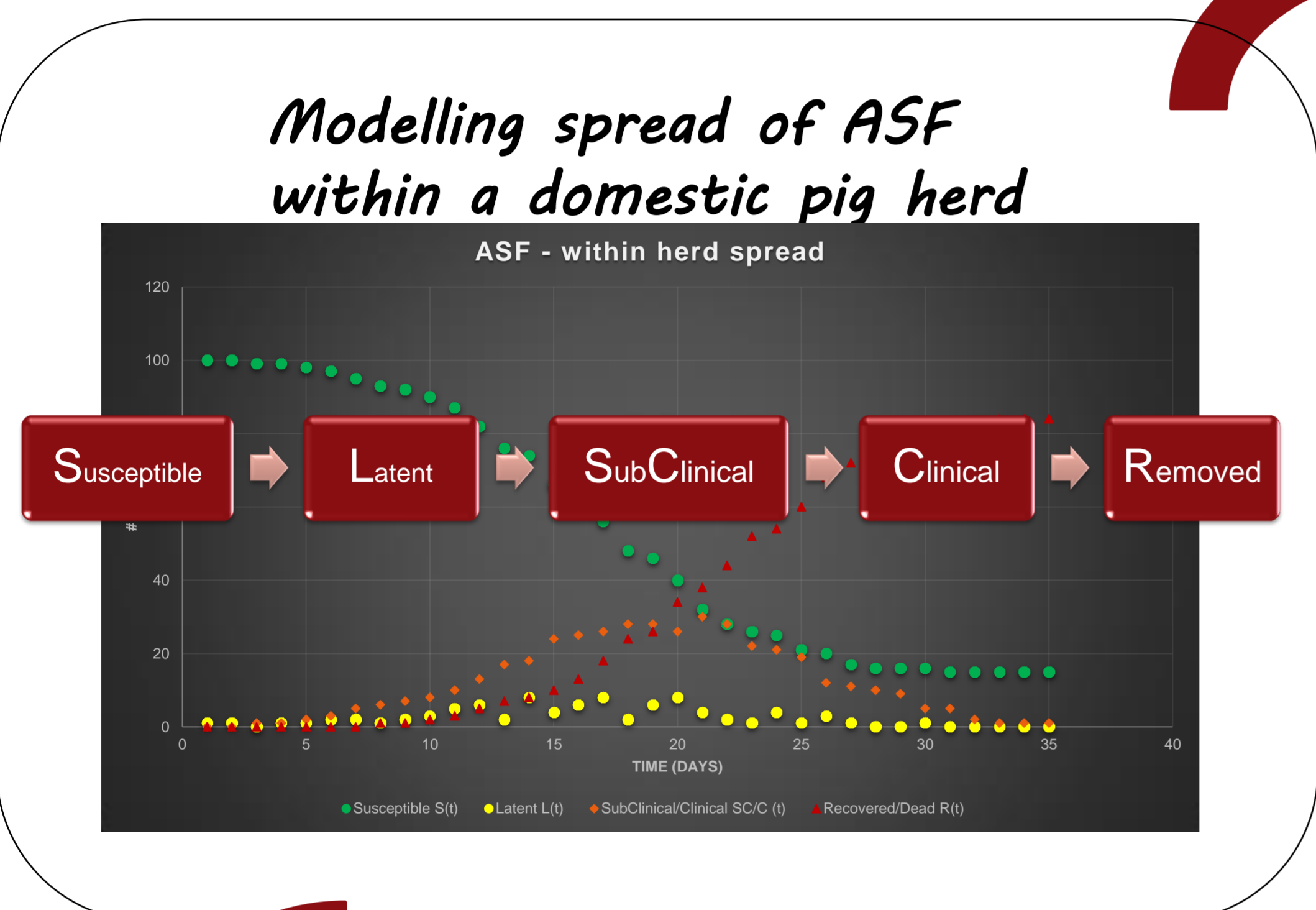
Results:
- Disease may fade out in a herd without a major outbreak
- Spread depends on
  - Infectiousness of sub-clinical animals
  - Residues of dead animals
  - Transmission rate of ASF-strain
  - Size of pig unit
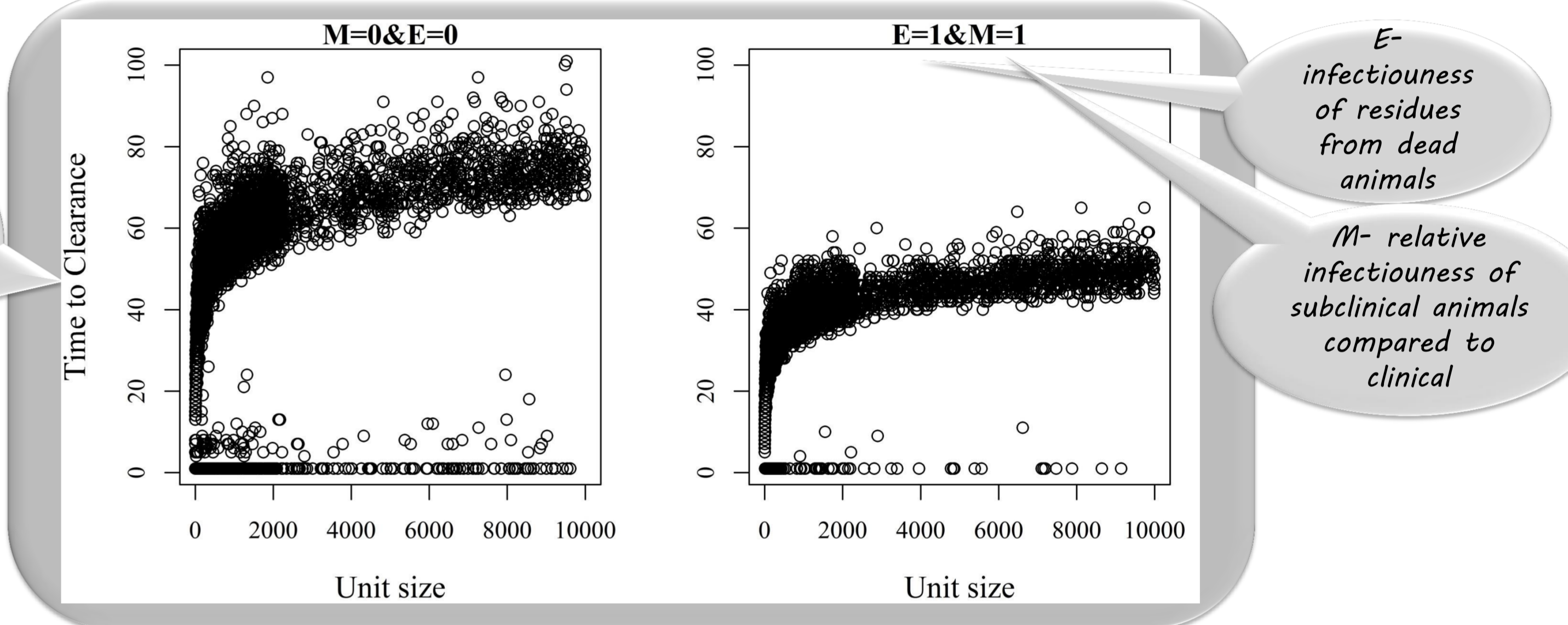
Time until african swine fever would either die off or all animals would be infected, at a high virus transmission ($\beta = 0.6$)

E- infectiouness of residues from dead animals

M- relative infectiousness of subclinical animals compared to clinical

Modelling spread of ASF between domestic pig herds

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

Perspectives:
Comparing control strategies
Fx intensive surveillance in zones
- What is intensive?
- Frequent visits?
- Serology?
- PCR?
- Dead animals?

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 1000 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.

- 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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