Applying epidemiological methods in animal disease outbreaks

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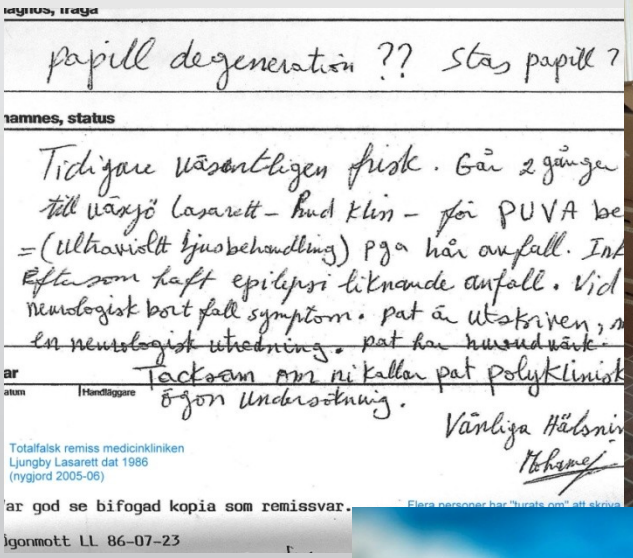
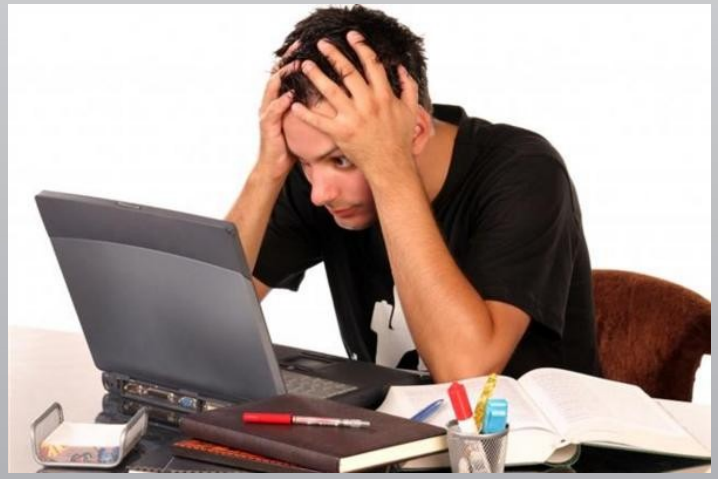
What we want….

What we usually have...





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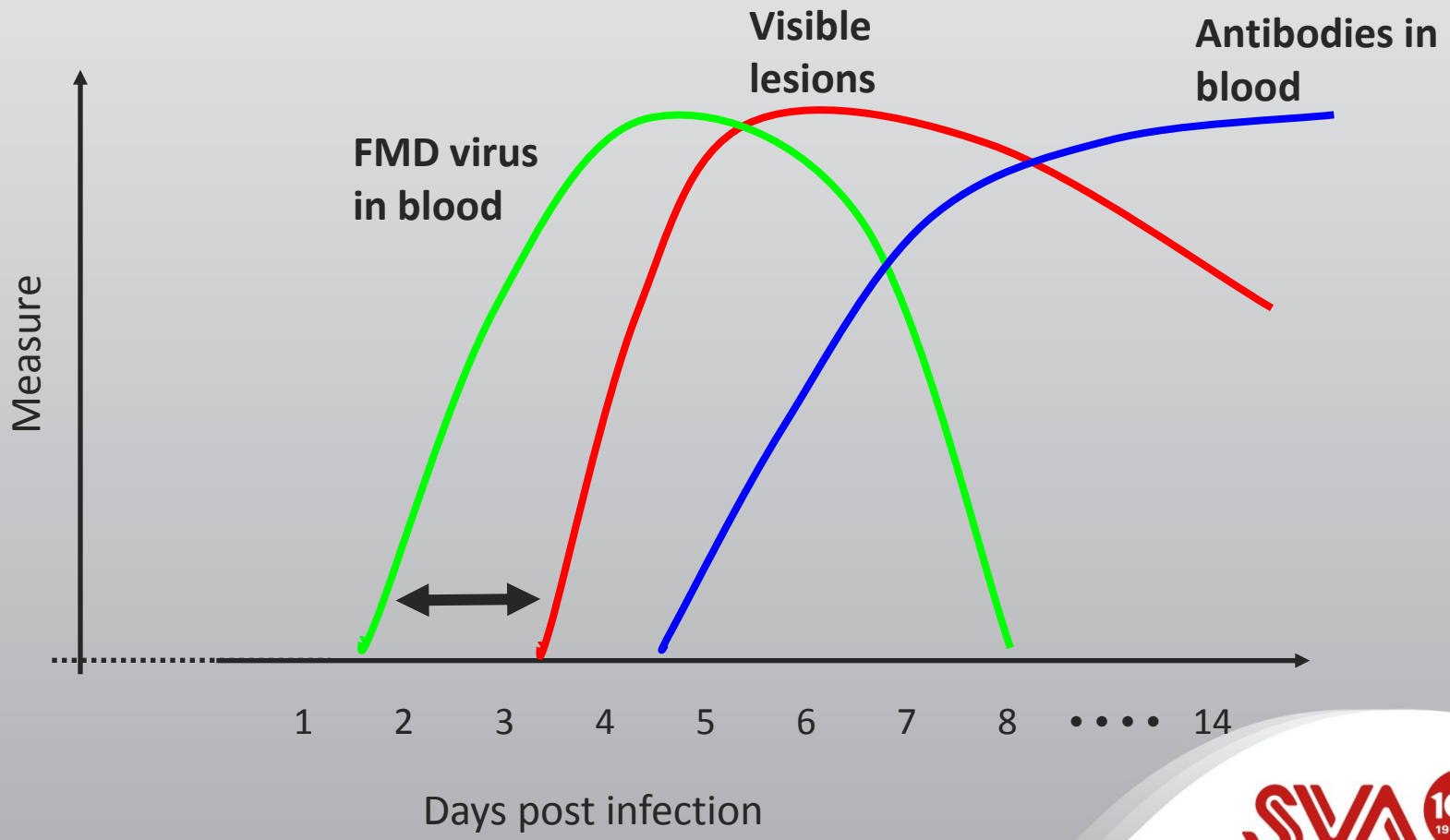
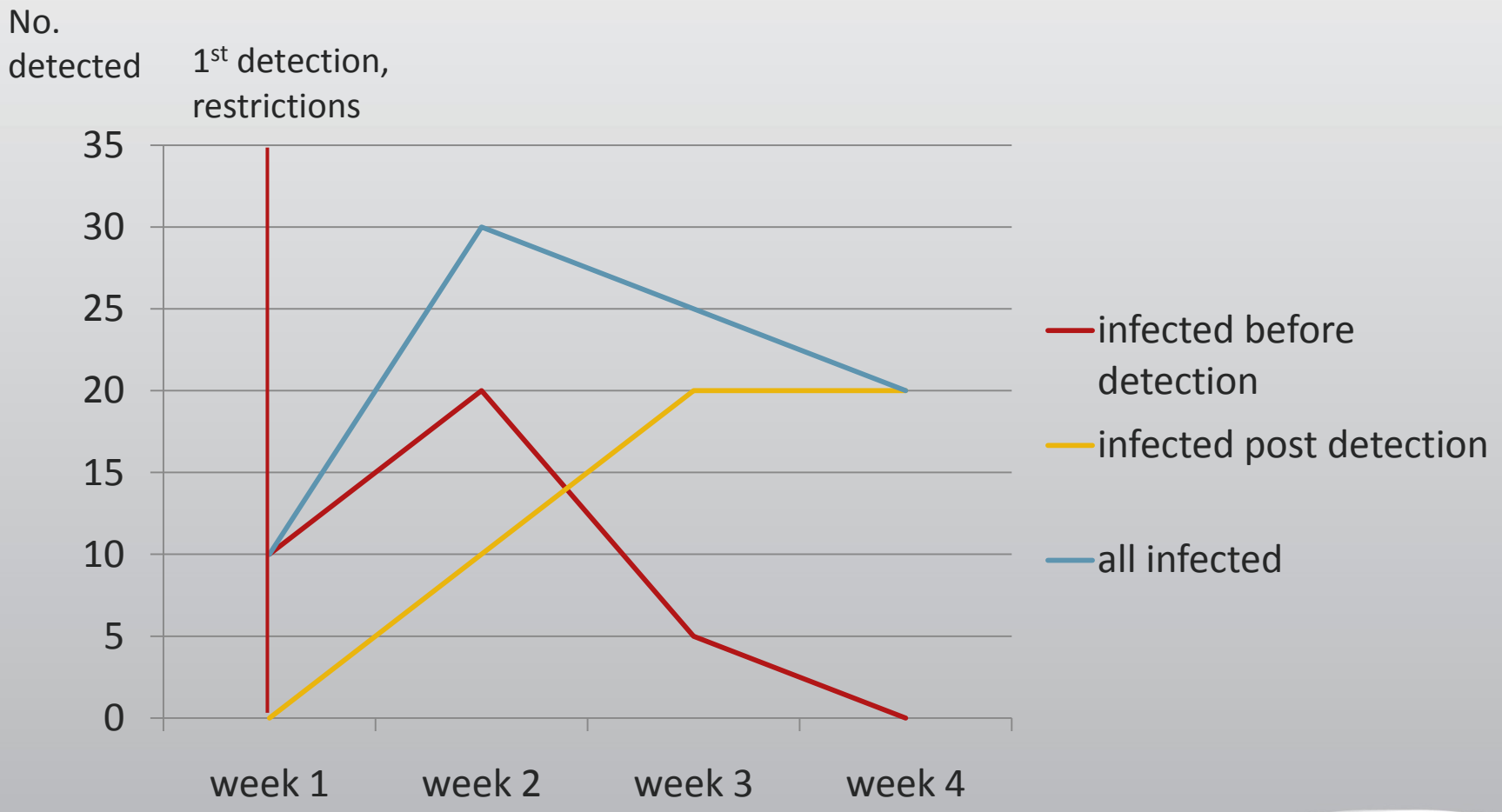
Data collection while fighting an outbreak

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

Diagnostic windows – time of infection



Do the restrictions work?



Full simulation models

- Complex
- Validation against outbreak data?
- Difficult to convey uncertainty
- Not enough data in outbreak situations?
- Most useful for testing strategies beforehand

Projects

- Cooperation National Veterinary Institute – University of Linköping, division of theoretical biology (direct and indirect spread of diseases), funded by Swedish Contingencies Agency
- Cooperation National Veterinary Institute – Swedish Meteorological and Hydrological Institute (windborne and waterborne spread of diseases)

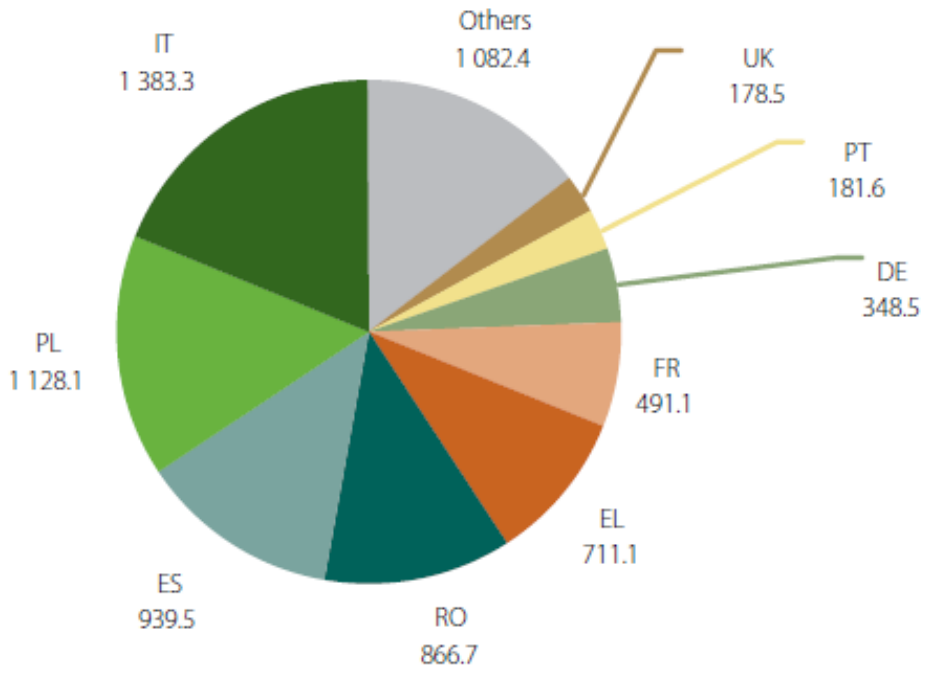
Pieces of the puzzle...

- Quick assessment of animal movement patterns, for estimation of necessary resource mobilisation
- Assessment of clinical and lab data from all infected herds, for estimation of time of infection
- Targeted surveillance and prevention aimed at previously identified risk herds
- “Stratified” R_0’s
- Meteorological modelling to assess need for larger zones
- Hydrological modelling to assess need for additional restrictions
- Continuous review of strategy based on plan obtained from modelling

Populations differ...

Countries differ...

Figure 1.1.1: Number of agricultural holdings* by country (1 000), EU-27, 2007



Source: FSS (ef_ov_kvaaesu)

* With at least 1 ESU.

Basic data

- Population – location, size and type of herds
- Animal movements – all livestock species, all movements
- Must be continuously updated and available for contingency work!

Catch 22...

- Outbreaks provide useful data
- Useful data make modelling possible
- Good models are useful for preventing outbreaks