The use of models in contingency planning

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During the last decades, the use of models in relation to outbreaks of contagious diseases in Europe has increased, especially driven by the large outbreaks of CSF in the Netherlands in 1997/98 and of FMD in England in 2001 and 2007. The interest in learning from our past has driven epidemiologist’s to compare what was actually done during the outbreaks, with what could have been done and how differences in choice of strategy and availability of resources could have changed an epidemic.

However, outbreaks of contagious diseases can be divided in two steps, the introduction of disease into a susceptible population, and the spread of disease, first within the infected herd and later between herds. The objective of the presentation will be to present how models have been used in Northern Europe.

A stochastic simulation model, called DTU-DADS, has been used to simulate spread of FMD and ASF in Denmark.

In previous studies, the model has predicted that from an epidemiological and economic point of view preemptive culling of neighboring herds is most often beneficial in the Danish situation. However, relatively small epidemics can be controlled using the basic control strategy, while very large epidemics might become less expensive with a vaccination strategy. Furthermore, one Danish study showed that combining these strategies with surveillance zones enlarged to 15 km would result in shorter duration of the epidemics and reduced costs.

ASF has a high mortality rate, and therefore left-overs from dead animals must be considered when spread of ASF is modelled. Therefore, a new model was developed for spread of ASF within-herds and included in the DTU-DADS-ASF model. This model predicts that outbreaks of ASF in Denmark will be of limited size and duration, however still with a considerable economic impact.