RESOURCE ESTIMATIONS IN CONTINGENCY PLANNING FOR FOOT-AND-MOUTH DISEASE (FMD)

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Background

- Foot and mouth disease (FMD)
  - highly contagious disease
  - ruminants and pigs (and other cloven-hoofed)
  - can lead to a large economic damage.

- EU legislation
  - must provide contingency plans
  - be prepared for an outbreak
Background

- Contingency plans should include
  - Provision for **adequate resources**
    - Personnel
    - Equipment
    - Laboratory capacity
  - Take into account resources needed to **control a large number of outbreaks** occurring within a short time
  - Ensure **methods for mass disposal** of animal carcasses and animal waste without endangering human health or environment
Questions

- What are the needs in an outbreak of FMD?
Methods – simulation model

Movement data
- movements of animals
- movements to abattoir
- milk tanker routes
- distances

Herd data
ID-numbers
Numbers of animals
Coordinates
Herd types

Data related to FMD
- time to symptoms
- within-herd spread

Danish contingency
- are symptoms recognised
- are rules followed
- are things reported (symptoms, contacts mv.)
Methods – simulation model

All epidemics started in a cattle herd in a cattle dense area

1000 epidemics simulated

1000 randomly chosen herds

Resource estimations in contingency planning for foot-and-mouth disease (FMD)
Methods - Sampling 100/1000 epidemics
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100 epidemics around the median are extracted
Methods - Sampling 100/1000 epidemics

100 epidemics around the median are extracted

Zone culling/vaccination

1000 epidemics starting in a cattle herd in a cattle-dense area
Methods - Data from simulation model

Average of herds in 100 epidemics

- Detected (118)
- Depopulated (143)
- Suspicions (5*detected)
- In zones
  - Protection zones (1768)
  - Surveillance zones (8080)
- Duration (87 days)

Daily averages used

Resource estimations in contingency planning for foot-and-mouth disease (FMD)
Methods – Data from simulation model
Methods – Data from experts

Which type of people should each team consist of?

How much time will they spend in one herd?

What equipment do they need?
Methods – Resource estimations

- Examples:

<table>
<thead>
<tr>
<th>Task</th>
<th>VET-days</th>
<th>Assistant-days</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 suspicion with symptoms</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1 traced contacts</td>
<td>½</td>
<td>½</td>
</tr>
<tr>
<td>1 zone visit</td>
<td>¼</td>
<td></td>
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Resource estimations in contingency planning for foot-and-mouth disease (FMD)
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Results – staff needed (Local crisis center)

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Danish Emergency Management Agency is responsible for the hygiene barrier, i.e. getting people, equipment and trucks in and out of outbreak farms.
Results – staff needed (VETs - local)

Number of persons needed daily. After day 14, the average per day is calculated for each week.

Administrative, Technicians, Veterinarians

Resource estimations in contingency planning for foot-and-mouth disease (FMD)
Results – rendering

Tons of carcasses for rendering per day. After day 14, the average per day is calculated for each week.
## Results (worst case) – lab capacity

- Virus isolation in cell culture: 40 samples per week
- Antigen ELISA (virus detection): 200 samples per week
- RT-PCR analysis: 2000 samples per week
- Serological analyses: 25000 samples per week
Perspective

• Are we prepared?
Perspective

• Compare with the current staff
  – Identify staff for different functions
  – Identify training need by function
  – Develop training programme by function
Perspective

- Compare with the current staff numbers
  - Identify staff for different functions
  - Identify training needs by function
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- Changing herd structure?
**Perspective**

- Compare with the current staff numbers
  - Identify staff for different functions
  - Identify training needs by function
  - Develop training programme by function

- Changing herd structure?

- Other control measures
  - Depopulation
  - Emergency vaccination

- Identify other resource needs and secure by contracts
  - Killing equipment
  - Wellies, protective clothing
  - Cars, hotels
  - Cleaning and disinfection
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