87th Executive Committee meeting of the EuFMD

Item:......7........
Author: Caroline Dubé...........
Options to consider for FMD modelling and decision support tools within EuFMD
A little about myself...

• Born in Montreal, Canada – bilingual (French and English)

• Veterinarian since year 2000 – dairy practice specialty

• Epidemiologist – MS (2002) and PhD (2009)

• Have worked for the Canadian Food Inspection Agency since 2002
  • FMD and HPAI modelling to support contingency planning and emergency preparedness.
  • Network analysis of livestock movements.
  • Livestock traceability analyses.
For the last 12 years, I have been involved in the following projects and groups:

- Established the North American Virtual Animal Disease Modelling Centre (NAVADMC);
- Technical lead in a FMD disease modelling training project in South America;
- Led the QUADS EpiTeam’s (AUS, CAN, NZ, UK, USA) first round of model intercomparison;
- Member of the North American FMD Vaccine Bank and QUADS Emergency Management Working Groups.
Other experiences and projects involving European colleagues:

- **NAADSM validation efforts with:**
  - UK, Netherlands, Switzerland
- **QUADS EpiTeam work:**
  - UK, Ireland with USA, New Zealand and Australia
- **Network analysis of animal movements:**
  - UK, Sweden
- **OIE technical item on epidemiological modelling:**
  - Dr Willeberg, DK
My understanding of the disease spread modelling situation within the EuFMD

- Member States (MS) with very different skills and access to disease spread models;
  - Limited modelling skills, no models;
  - Modelling skills, no models;
  - Modelling skills and models...

- At this time looking at its use in contingency planning;
- Vaccination is a key issue for all MS;
- EU-level modelling vs regional vs within MS questions;
- One model? Multiple models? Which model(s)?
Example of the process we have gone through in North America:

• In 2000, the NA FMD vaccine bank officials asked epidemiologists: how many doses do we need in the bank?
  • Answer: we need a model to explore this question!

• CVOs, emergency planners met in 2002 to evaluate models from around the world to chose one that was:
  • User-friendly, transparent, reliable, generic enough to be applied to the three countries.

• This led to the development of the North American Animal Disease Spread Model (NAADSM) 2003-2007.
A proposal - stepwise approach to modelling in EuFMD

1. Ensure all MS have a basic knowledge of models and disease spread modelling – EuFMD workshop and e-learning course.

2. Review available disease spread models for FMD available in MS and other models of interest from outside Europe.

3. Establish a modelling network through a workshop to review a number of models of interest and to develop an outline of a common project.
1. FMD modelling workshop and e-learning – developing the “intelligent customer”

- The objective is for all MS to have a baseline level of knowledge of disease spread modelling for FMD contingency planning:
  - What data goes into these models?
  - What kinds of questions can they support?
  - Establishing a modelling team/project within the central government – requirements and objectives.

- Promote regional collaborations for common questions and issues.

- Enable dialogue between MS on the use of models for contingency planning.

- NAADSM used as an example. Provides a good basis for training.

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2. Review available models for FMD in all MS and other models of interest outside the EU.

Models come in different sizes and forms:

- Mathematical vs simulation, contingency vs emergency, country-specific or disease specific vs generic, interface vs no interface and coding required.

Terms of acceptance for models to inform contingency planning in North America were developed in 2012:

- Ensure transparency of procedure, verification and validation (as much as possible) procedures and other issues of importance to be used by decision-makers with confidence.
- Could be used to assess models available.

Database being developed in the USA – could access?
3. Establish a modelling network within EuFMD

- **Network of users of models for contingency planning.**
  - Emphasize that this network should include epidemiologists/veterinarians involved in supporting contingency planning – example is QUADS EpiTeam.

- **Determine if there is a need to model at the EU-level? At regional level? Or within-country is sufficient?**
  - **Review presentations of selected models of interest to decide on common model(s).**
  - **Identify a project to be addressed at a regional or EU-level.**
Example in North America

• A decision was made by the NAVADMC in 2013-2014 to develop the “North American Standard Model”:
  • A parameterized version of InterSpread Plus (model from New Zealand) which represent within-country and cross-border dynamics – should be developed by March 2015.

• Addresses the integration of the livestock industries in Canada and the USA.

• This model will support:
  • Canada and USA-only simulations for evaluation of optimal control measures by country/region/state-province.
  • Cross-border simulations to evaluate zoning initiatives, vaccine bank requirements, potential for cross-border spread.
Need to consider other issues related to the use of models in central veterinary services

- CVO support
- Communication strategy for the results
- Strategy for the use of models:
  - Prior and/or during an emergency?
  - How to account for results and other information from the field as well as uncertainties in data during an outbreak.
  - Other decision-support tools to be used during an emergency.
- Access and use of potentially confidential data and implications for regional simulations.
- Economic analyses following epidemiological modelling
In conclusion

- Workshop on vaccination as a control measure

- Survey of models existing in MS and outside MS

- Workshop establishing a modelling network
  - Determine the scale of the modelling effort required
  - Identify key vaccination questions to answer
  - Is there a model or models that can address the scale and question to be addressed?