EFSA activities on Lumpy Skin disease: recent and ongoing activities

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Standing Group of Experts on Lumpy Skin Disease in the South East Europe region – Istanbul, 12-13 December 2016

TIMELINE OF EFSA ACTIVITIES ON LSD

1. Jan 2015, scientific opinion: focusing the problem
2. May 2016, EFSA-EC workshop, fostering cooperation
3. Aug 2016, Urgent advice : assessing effectiveness of control measures
4. 2016-2017, Current data collection: learning from epidemics

FIRST EFSA OPINION – HIGHLIGHTING GAPS

KNOWN

- Transmission by haematophagus arthropod vectors
- LSDV detectable in animal secretions
- Live vaccines
- PCR, SNT

UNKNOWN

- Which vector species? Biological vectors?
- direct or indirect transmission?
- Milk products? Safe organs? Contaminated feed?
- ELISA? DIVA, safety and purity issues?

Science has moved forward:

- DIVA qPCR (Menasherow et al., 2016)
- Full genome sequencing of vaccin strain (Mathjis et al., 2016)

Simulating spread and impact

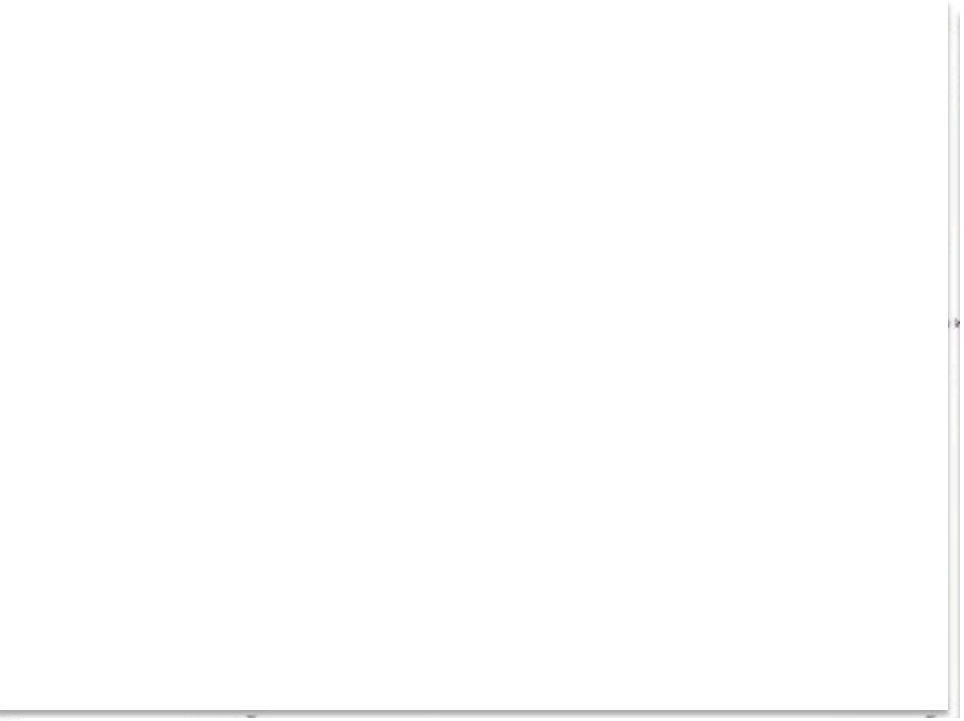
METHODOLOGY

Stochastic kernel-based model of LSD spread

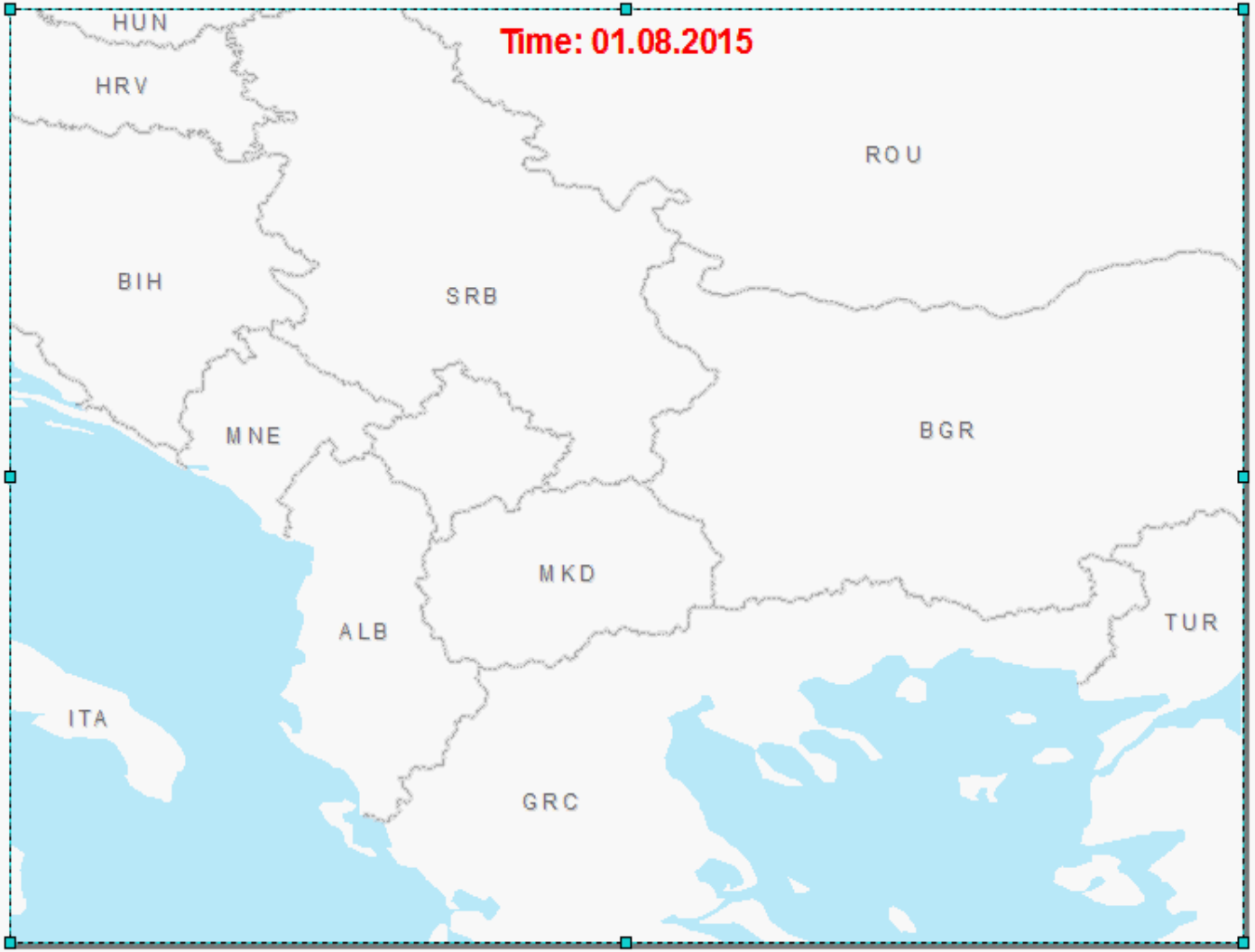
- between-farms transmission

Control strategy scenarios:

- i) the removal of clinical cases
- ii) whole-herd culling after 7, 15 or 28 days after infection.



WHAT HAPPENED SINCE SUMMER 2015



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SPREAD SCENARIOS EXPLORED IN GR AND BG

EC: assess the spread and persistence of a partial stamping-out policy compared to total stamping out

ELEMENTS INCLUDED IN THE MODEL

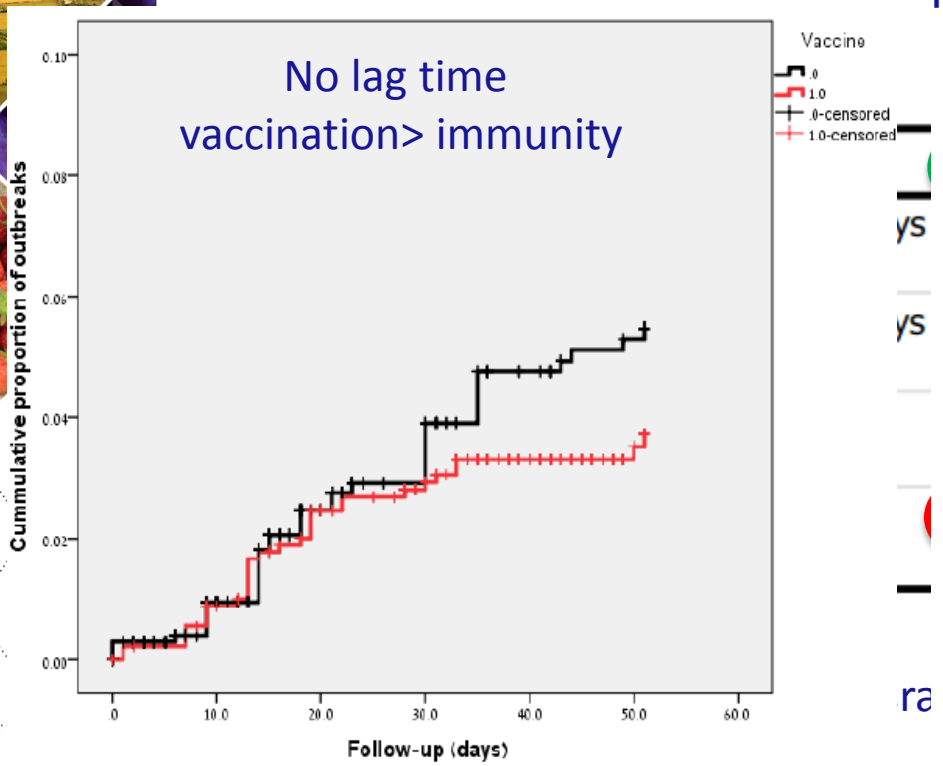
- Delay between infection and report: 1-2 weeks (mean 10.5 days, gamma dist.)
- delay between report and stamping out: based on the data from Greece and Bulgaria (mean 7.6 days, gamma distr.)
- Partial stamping out: i) by reducing outbreak duration; ii) by reducing the infectiousness; iii) by increasing the outbreak duration and by reducing the infectiousness
- Total stamping out: Removing the farm at a certain time (mean of 7.6 days after reporting)
- Vaccination: replacing herd sizes with the number of unprotected animals in each herd
- vaccination effectiveness 75% (Ben-Gera et al. 2015) and calculated from the data from Greece and Bulgaria, and 40%.
- Preventive and reactive vaccination: different time of vaccination start
- Vaccination coverage: 95% farms
- Maximal protection: after 21 days post vaccination

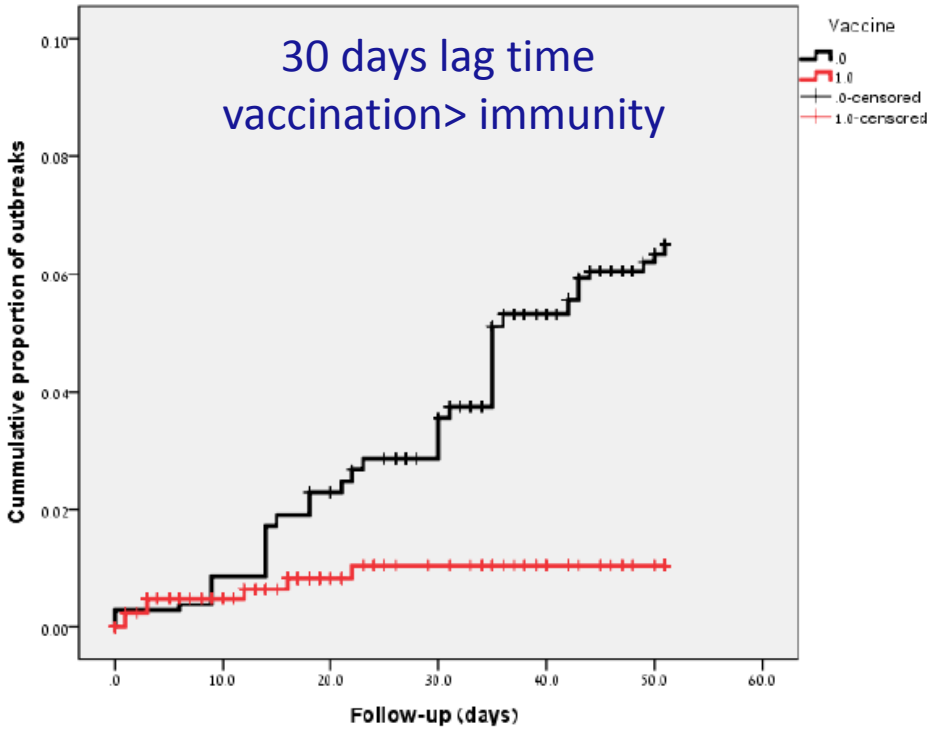
STAMPING OUT	VACCINATION		
	None	after virus entry	before virus entry
NONE			
PARTIAL			
TOTAL			

ESTIMATION OF VACCINATION EFFECTIVENESS IN THE FIELD

survival analysis comparing LSD incidence

probability of infection in the **vaccinated** and **unvaccinated farms**





KEY MESSAGES

- vaccination better than any stamping-out policy to reduce LSD spread
- Performance of type of stamping out depends on effectiveness of coupled vaccination
- partial stamping out leads to limited increase of spread compared to total stamping out
- most effective vaccination policy:
  - protection developed at the time of virus entry
  - high coverage within and between farms

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OBJECTIVES

- Learn from current outbreaks
- Strengthen collaboration between EFSA and MSs and neighbouring countries
- Harmonise and increase efficiency of data collection

Improve RA quality

DATA TO BE COLLECTED

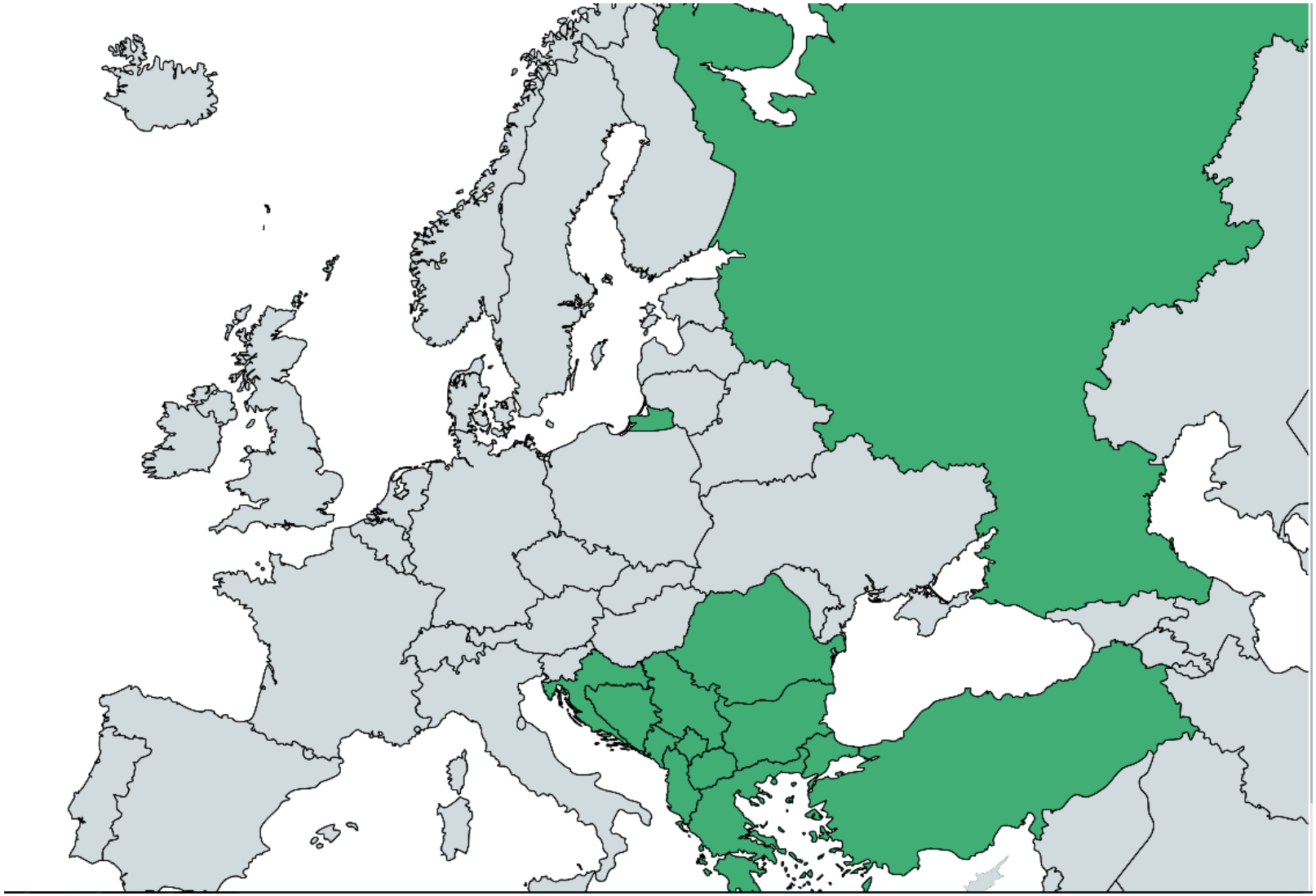
- Demography
- Outbreaks
- Vaccination
- Movement of animal/people/feed
- Laboratory test

- Geo-climatic data and land cover
- Vector presence/abundance

POSSIBLE USE OF THESE DATA

- **Spatial and temporal patterns of outbreak**: infection kernel, morbidity between farms, within farm
- **Seasonality of the disease**: Relationship between outbreak and climatic issues and vector activity
- **Risk factors**; type of farming, grazing, animal movements, farm/animal density, introduction of new animals/feed, land cover, season/climatic
- **Estimation of subclinical disease**
- **Vaccination effectiveness and safety**

COUNTRIES INVOLVED



EFSA technical meeting, 20th Dec 2016

- what data would be useful (data model)
- What data are/could be available
- What else can be collected along 2017
- how to submit data by Data Collection Framework of EFSA

OVERALL CONCLUSIONS

- LSD as neglected disease with lots of knowledge gaps
- Research needed for :
  - vector biology
  - diagnostics for mass screening, DIVA
  - Vaccine – safety, DIVA
- New epidemiological situations: adapted policies
- Regional problem > regional cooperation for enhancing preparedness, knowledge sharing
- Learning from epidemics:
  - **ready data model for data collection**
  - **Coordinating centre for data collection**

Thank you for your attention!

Acknowledgements

- Representatives from National Authorities from affected and at risk countries
- WG experts

EFSA staff:

- Andrey Gogin
- José Cortiñas Abrahantes

Further info and all EFSA outputs at:
https://www.efsa.europa.eu/en/topics/topic/lumpyskindisease