



Open session of the Standing Technical and Research Committees of the EuFMD

Cavtat (Croatia), 29-31 october 2014



eofmd
european commission for the
control of foot-and-mouth disease

Risk analysis framework to compare the importance of source regions for FMDV entry into Europe

Lucie Collineau², Melissa McLaws¹, Caroline Dubé³, Katharina Stärk², Keith Sumption¹

¹ EuFMD, FAO Rome, Italy

² SAFOSO, Liebefeld, Switzerland

³ Canadian Food Inspection Agency, Ottawa, Canada

Context

The selection of vaccine strains to be represented in the EU FMD vaccine bank should be based on risk assessment informed by up-to-date knowledge of the global distribution of FMDV serotypes and strains and of the likelihood of their spreading to the EU

SANCO/7070/2010

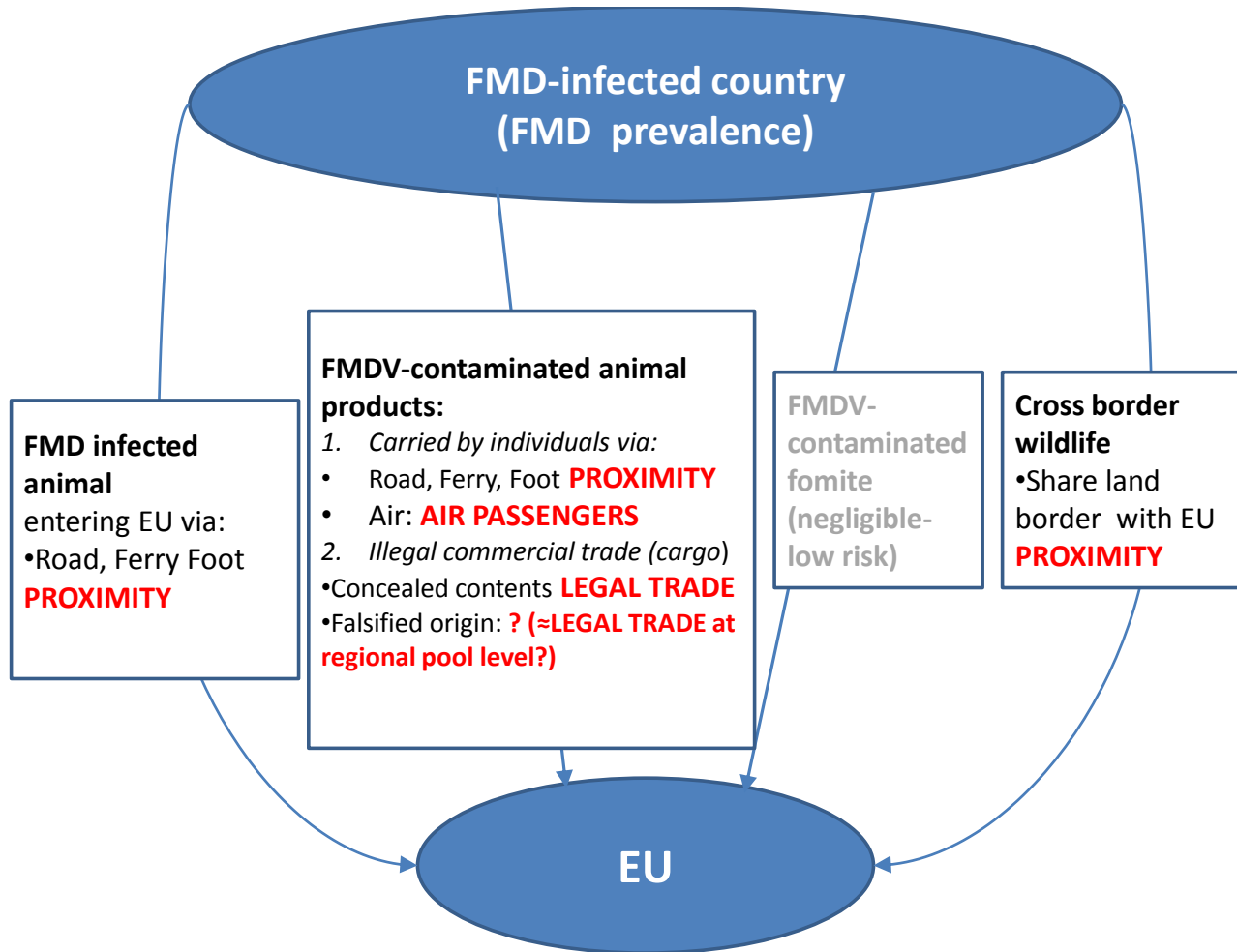
Objective

To develop a risk analysis framework to compare the importance of source regions for FMDV entry into Europe

- Source regions = FMDV pools
- FMDV entry = crossing the EU border (not necessarily leading to animal exposure)
- Europe = EU as a whole (no distinction between EU countries)

Method

Initial model: McLaws et al., FMD Week 2010, Vienna, Austria



Method

Initial model:

McLaws et al., FMD Week 2010, Vienna, Austria

- Update: FMD prevalence level, proxies
- Refinement: considering additional transmission pathways , weighting proxies
- Application of a more systematic approach (scenario tree)

Method

What conditions are required for FMDV to enter the EU?

1. FMDV must be **present** in the country of origin
2. FMDV must be **transported** via one of these routes:
 - Illegal import of infected animals or contaminated products and no detection at the border
 - Entry of infected wildlife (wild boars, deers)
 - Returning trucks

Assumption: FMDV has a negligible risk to enter via legal trade of animals and animal products

3. FMDV must **survive** in animals and contaminated products

Pathway 1: illegal import of live animals (road)

Pathway 2: illegal import of animal products for personal consumption

Pathway 3: illegal import of animal products for commercial purposes (by road)

Presence of infected animals or products at origin
(FMD incidence score)

Possible pathways

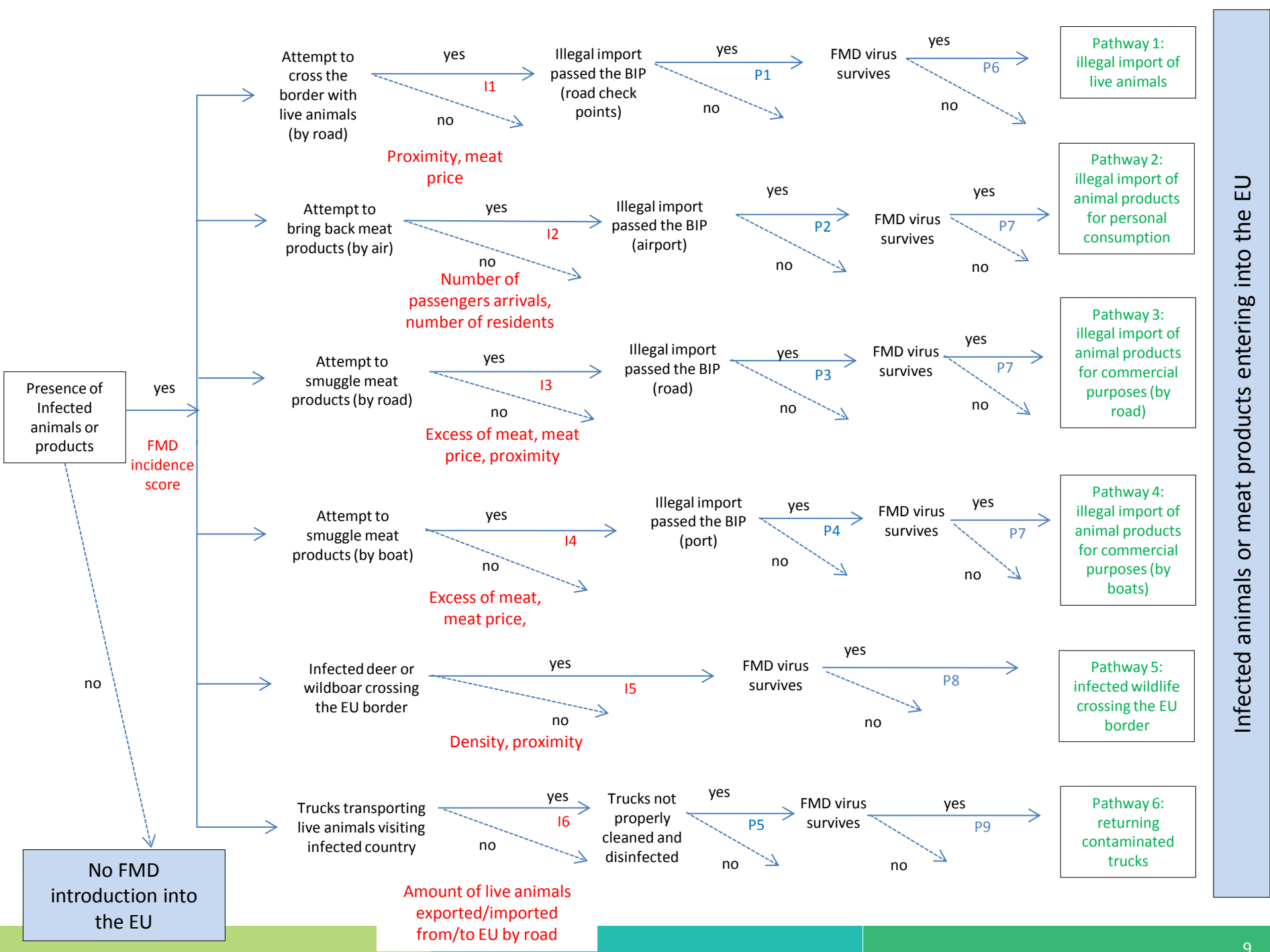


Infected animals or animal products enter EU

Pathway 4: illegal import of animal products for commercial purposes (by boat)

Pathway 5: infected wildlife crossing the EU border

Pathway 6: returning contaminated trucks



Infected animals or meat products entering into the EU

Model parameterization : FMD incidence score

ORIGINAL ARTICLE

Incidence and Distribution of Foot-and-Mouth Disease in Asia, Africa and South America; Combining Expert Opinion, Official Disease Information and Livestock Populations to Assist Risk Assessment

K. Sumption¹, M. Rweyemamu^{2,*} and W. Wint³

¹ Animal Health Department, Food and Agriculture Organization, Viale delle Terme di Caracalla, 00100 Rome, Italy

² 6 Robins Dale, Knaphill, Woking, Surrey GU21 2LQ, London, UK

³ Environmental Research Group Oxford, Department of Zoology, South Parks Road, Oxford OX1 3PS, UK

- Score 1-4, based on:
 - K. Sumption et al. 2008
 - OIE WAHID database until 2014
 - National seroprevalence studies
 - Progressive control pathway stage (when available)
 - Performance of the veterinary services (PVS OIE reports when available)

Model parameterization: Transmission pathways

Proxy	Pathway	Data sources	Score	Uncertainty
Proximity of country X to the EU	1,3,5	Google maps	{0; 1}	Null
Meat price differential between EU and country X	3,4	FAOSTAT 2012, FAO GIEWS 2013, OECD 2013	{1; 2; 3; 4}	Medium
Number of passenger arrivals in EU from country X	2	Eurostat 2013	{1; 2; 3; 4}	Medium
Number of EU residents with country X nationality	2	Eurostat 2013 + national databases	{1; 2; 3; 4}	Low
Excess of meat in country X	3,4	FAO STAT 2009	{1; 2; 3; 4}	Medium
Density of wildboars and deer in country X	5	FAO EMPRES 2010, Burbaite et al. 2010	{1; 2; 3; 4}	Low
Amount of live animals traded between country X and EU by road	6	Eurostat 2013	{1; 2; 3; 4}	Medium

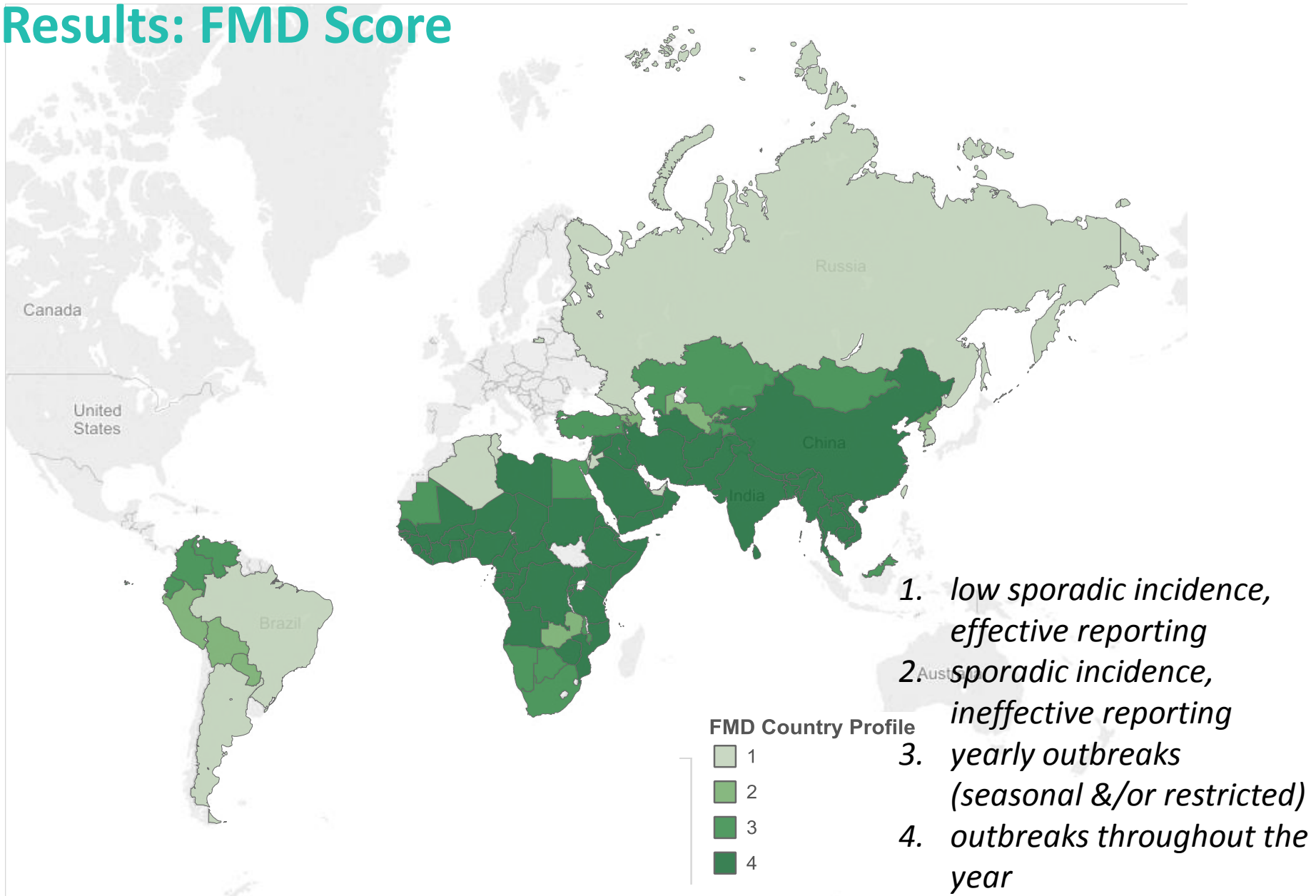
Model parameterization: Transmission pathways

- Expert elicitation
 - Relative importance of each proxy on the I1 to I6
 - Probability of illegal imports of animals/animal products to be detected at the border inspection points
- Literature
 - FMDV survival in live animals / animal products / manure

→ Model outcome:

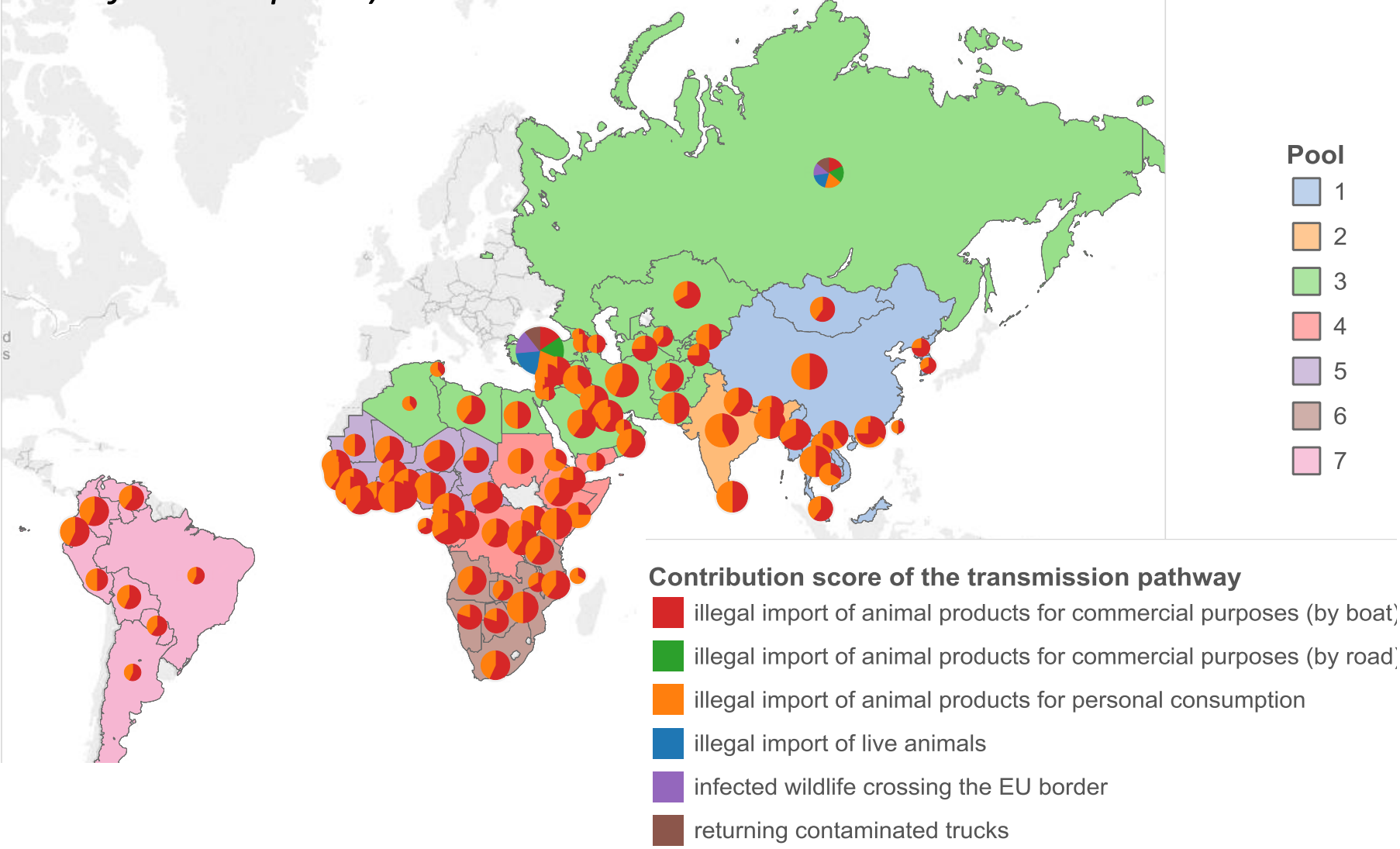
- 1 score per transmission pathway per country
- Total score per country = \sum scores over the 6 pathways
- Qualitative description of the country contribution to FMD entry into EU

Results: FMD Score



Estimated relative importance of transmission pathways

(preliminary results: pie size reflects overall importance of country, map colours for virus pools)



Discussion

Model construction

- Additional transmission pathways to be considered?
 - Legal trade of animals (eg risk if very recent FMD incursion)
 - But not informative to vaccine bank
 - Waste from international planes and ships
 - Semen importation

→ Most probably at negligible risk
- Selection of the proxies
 - How representative are they of risk pathways?
- Relative importance of pathways

Discussion

Model parameterization

- Main data gaps
 - Routine seizures data at border inspection points (only publicly available for UK at the moment)
 - Origin of ships / flights / passengers arriving at the EU border
 - Comparable national meat prices (same calculation method)
- From which countries should transmission by road be considered?
- How often do we need to update the model?

→ Your input is very welcome!

Next steps

- Finalization of the model parameterization
 - Sensitivity analysis
- Combine risk assessment with data on FMDV serotypes and strains circulations (WRL Pirbright)
 - Recommendations for EU vaccine banks
- Risk assessment expanded to include exposure of EU susceptible animals
 - Better conducted at EU country level?

Thank you for your attention

