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Risk of further EHDV introduction in Europe

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RISK OF FURTHER EHDV INTRODUCTION IN EUROPE



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Epizootic Hemorrhagic Disease Virus (EHDV) is a growing threat in Europe for the livestock industry. New incursions are triggered by **wind dispersal** of the *Culicoides* vectors and **trade movements** of live animals.

How to estimate the Risk of EHDV introduction? A dual-pathway model in 3 steps

01

×

02

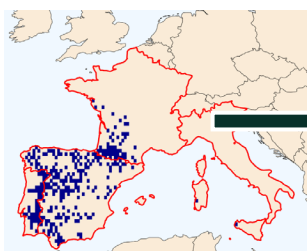
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03

Level of infection at source

Probability to go from source to destination

Secondary cases at destination



 EHDV infected
 Zone until Aug 2024



[1]



[2]



$IR_{\phi, \tau, \psi}$

[1] <https://doi.org/10.1155/2024/5571195>

[2] <https://doi.org/10.1371/journal.pone.0053128>

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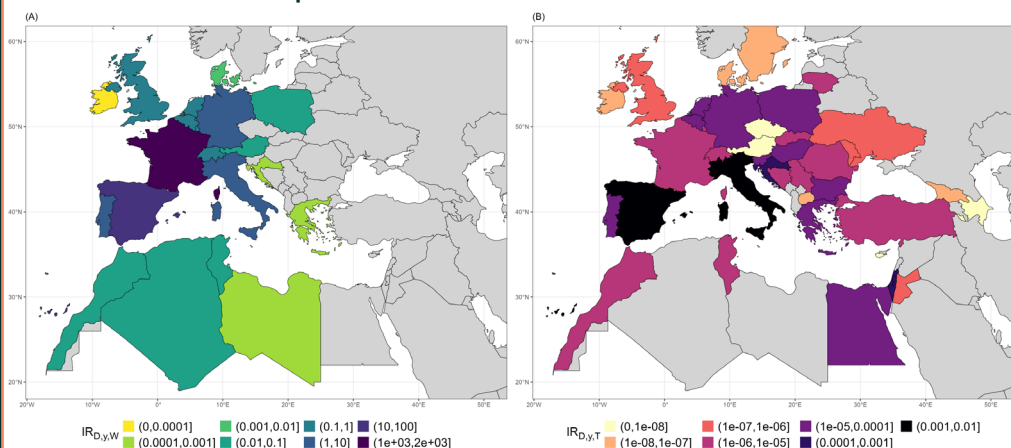


Where ? When ?

Spatial Distribution of Yearly Risk of EHDV introduction by country

Wind Dispersal

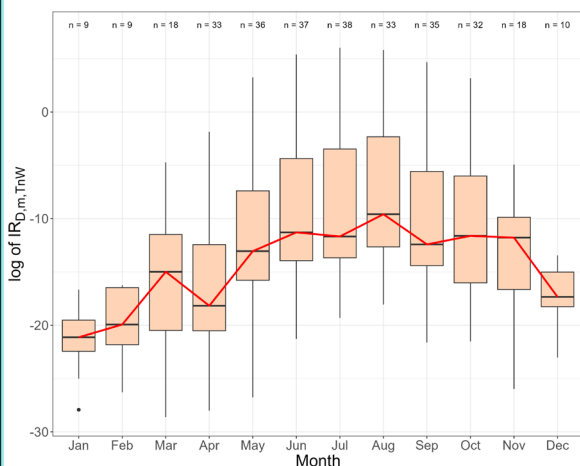
Trade



- Risk by wind > Risk by trade
- High-risk destinations by the wind = France, Spain & neighbouring countries
- Low or very low risk level by the trade but extended risk zone
- High-risk destinations by trade = Spain, Italy

Temporal variation of Risk

Cumulative risk per country over the 2 pathways of introduction (in log)



- Period at-risk from June to November
- Animal movements contribute to sustain a baseline level of risk during the colder months, notably in March.

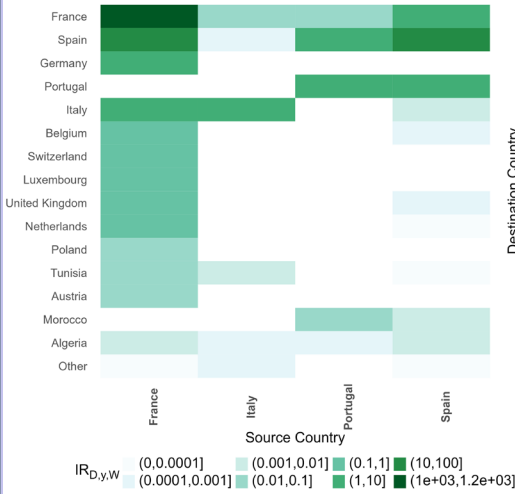
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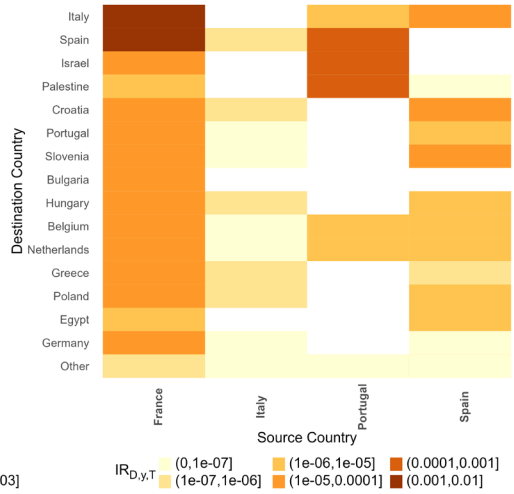
By which pathway?

HeatMap of Risk : source and destination combinations

(A) Wind Dispersal



(B) Trade



- Portugal contributes to risk outside EU (Israel/Palestine) by trade
- Italy: low contributor due to limited initial source zone

Conclusions

- Risk of EHDV introduction: broad risk area in EU but highly variable risk levels
- Wind: primary risk pathway to nearby countries (France & Spain)
- Trade: Low risk overall, basal risk in distant countries/cool periods
- France: Key risk source for both pathways



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17th International Symposium on Veterinary Epidemiology and Economics 2024
Veterinary epidemiology and economics down under in leags and bounds

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