UNIVERSITY OF COPENHAGEN DEPARTMENT OF VETERINARY AND ANIMAL SCIENCES



# QUANTITATIVE RISK ASSESSMENT REVIEW: INFECTIOUS DISEASE INTRODUCTION IN ANIMAL POPULATIONS

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Aim		Search Terms
To conduct a comprehensive literature review to	Scopus	risk AND assessment* AND animal* AND quantitative* AND health AND "Risk Assessment"
	PubMed	(("risk assessment" OR ("risk" AND "assessment" AND

identify and evaluate published research on quantitative risk assessment (QRA) of disease introduction in livestock, wildlife, and aquatic animal populations globally, from 1/2010 to 9/2024.

("Insk assessment OK (Tisk AND assessment AND ("animals" OR "animal\*") AND "quantitative\*" AND ("Communicable Diseases" OR "disease transmission, infectious" OR "communicable diseases, emerging" OR "Disease Notification" OR "Disease Vectors" OR "Disease Outbreaks" OR "Zoonoses" OR "Disease Reservoirs" OR "communicable diseases, imported"

### Results

- 1867 papers screened:

- 34 studies included in the analysis

- 15 viral and 1 bacterial pathogens considered
  - 53% assess risk of disease introduction
- 26% assess risk of introduction + exposure
  - 6% assess risk of introduction + consequence
  - 15% assessed risk associated with exports

- 62% covered Import Risk Assessment (IRA)
- 12% covered imported vector-associated cases
- 15% covered introduction via exports
- 12% other introduction pathways
- 38% QRA's based on scenario trees
- No QRA for aquatic animal diseases

#### Purpose

**Risk Type** 

### **Scenario Tree**



Figure 1: The Sankey diagram illustrates the relationships between the pathogens, the QRA purpose, the risk assessed, and the methodology using scenario trees in the reviewed literature. African Horse Pathogens: Sickness Virus (AHSV), Equine Encephalosis Virus (EEV), African Swine Fever Virus (ASFV), Classical Swine Fever Virus (CSFV), Bovine Tuberculosis (bTB), Bovine Viral Diarrhea Virus (BVDV), Foot-and-Mouth Disease Virus (FMDV), Avian Influenza Virus (AIV), Japanese Encephalitis Virus (JEV), Lumpy Skin Disease Virus (LSDV), Newcastle Disease Virus (NCDV), Peste des Petits Ruminants Virus (PPRV), Rabies Virus (RABV), Rift Valley Fever Virus (RVFV), Swine Vesicular Disease Virus (SVDV), and West Nile Virus (WNV).

## Conclusions

- Most publications focused on Import Risk Assessment for live animals and/or animal products
- From the four risk types, the consequence was seldom considered
- There is a gap in QRA studies on wildlife and aquatic animals
- The majority of the studies were conducted in the E.U. and member countries, followed by the U.S. and South Africa

AH&W

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