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Animal health risk of legally imported exotic animals into the Netherlands

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Background

- Worldwide, millions of exotic animals are traded legally and illegally
- These animals are potential vehicles for dispersion of infectious diseases
- The Netherlands play a significant role as importing country & transit hub
- More insight into the pathogens that could be introduced can help to target surveillance efforts

Objective

To evaluate the animal health risk for the Dutch livestock sector associated with the legal importation of exotic animals originating from third countries (i.e. non-EU member states)

Material and methods

- Descriptive analysis of trade flows of exotic animals to the Netherlands
  - Mammals, birds, reptiles, and amphibians
  - Period 2013-2014
- Selected diseases from OIE-listed diseases and notifiable diseases in NL
  - Worldwide occurrence (OIE, ProMED, literature)
  - Susceptibility of imported animals (factsheets, literature)
- Relational database to match data on imported animals, source countries, and susceptibility (Fig. 1)
- Semi-quantitative risk assessment based on proxy variables to assess the probability of introduction and impact of disease
  - Only for those diseases for which susceptible animals were imported from infected territories

Results

Trade flows of exotic animals

- In 2013-2014, the Netherlands imported 2.1×10^5 exotic animals from 25 countries (Fig. 2)
- The majority of animals were reptiles (93.8%) and amphibians (5.8%)

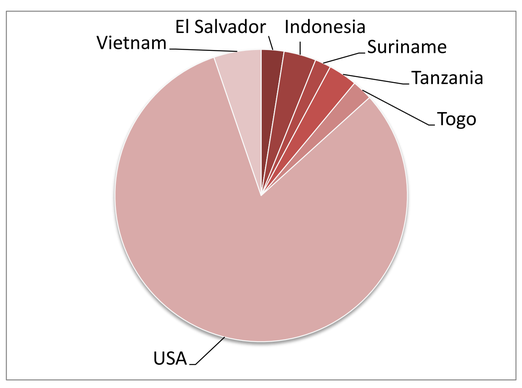

Figure 2. Relative contribution of source countries that contributed > 1% to total number of imported exotic animals

Risk assessment

- Risk scores were calculated for nine diseases (Fig. 3)
- For most diseases the estimated probability of introduction was relatively high, whereas the impact was low to moderate for all diseases

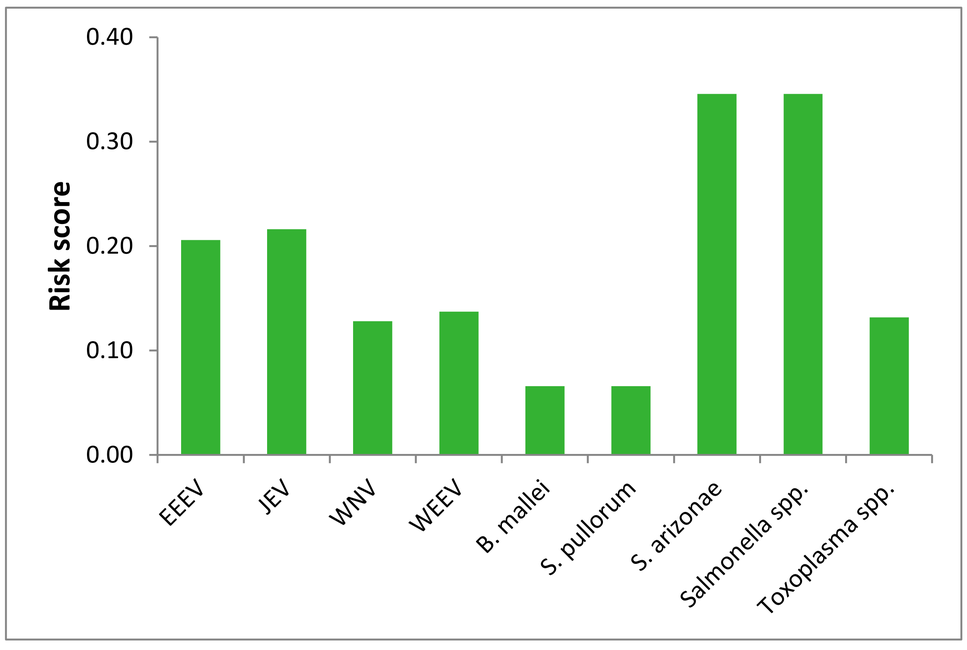

Figure 3. Calculated risk scores for nine diseases: Eastern equine encephalitis (EEEV), Japanese encephalitis (JEV), West Nile (WNV), Western equine encephalitis (WEEV), glanders (*Burkholderia mallei)*, Pullorum disease (*Salmonella pullorum*), infection with *Salmonella arizonae*, salmonellosis caused by exotic strains, and toxoplasmosis caused by exotic strains

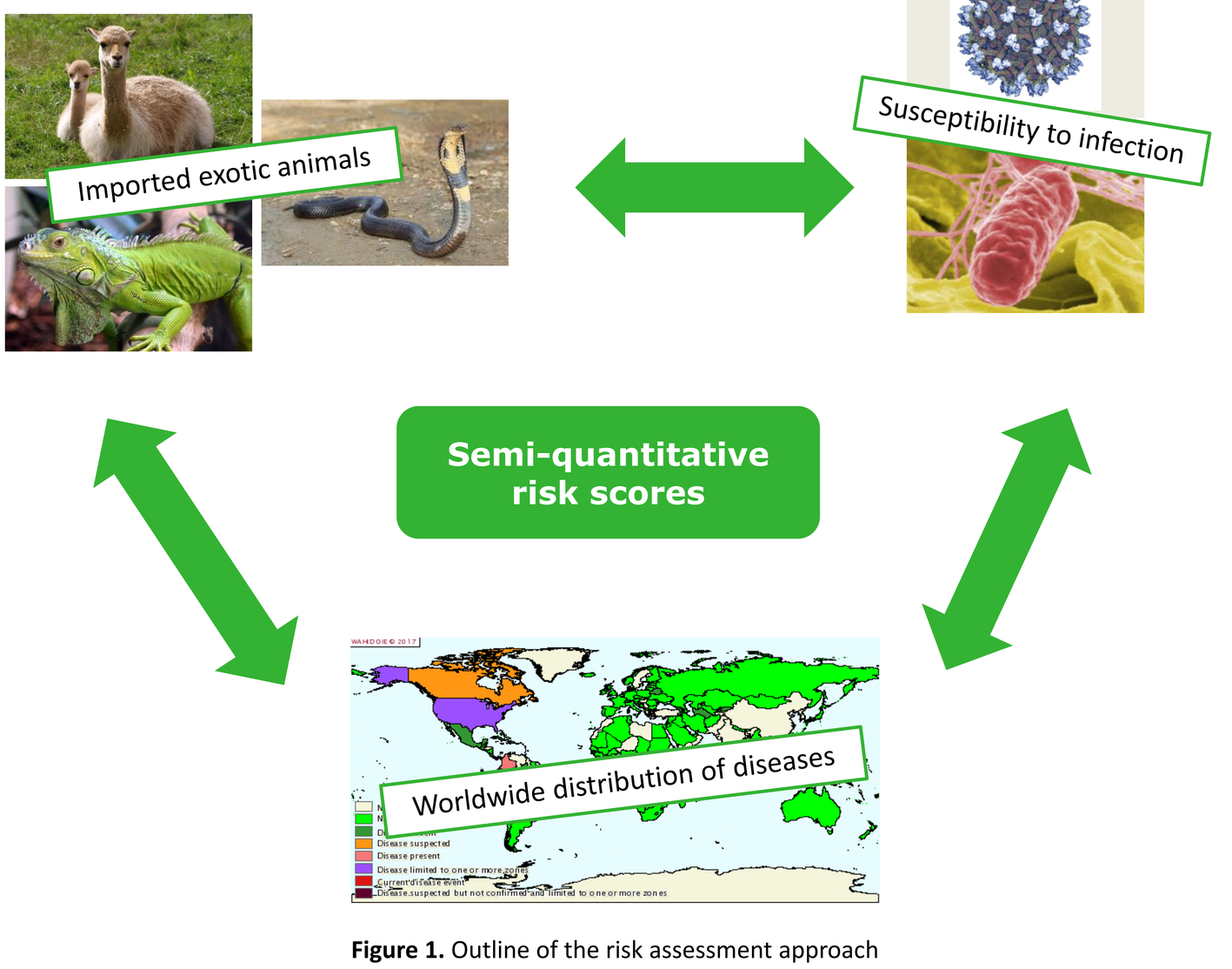

Figure 1. Outline of the risk assessment approach

Conclusions

- Overall, the animal health risk of legally imported exotic animals was low
- Introduction of *Salmonella arizonae* and *Salmonella* spp. (exotic strains) posed the highest risk
- Reptiles are an important introduction pathway for *Salmonella* and the arboviral diseases Japanese encephalitis, Eastern equine encephalitis, and Western equine encephalitis
- Risk-based testing of imported reptiles and amphibians is advised
- Changes in trade flows of *Artiodactyla*, *Perissodactyla* and *Rodentia* need to be monitored, because these might lead to an increased introduction risk of diseases not included in our assessment

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