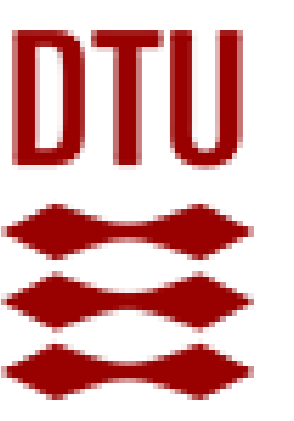


# G-RAID: Assessing the incursion risk of African swine fever virus using generic risk assessment tools

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G-RAID = **G**eneric approaches for **R**isk **A**ssessment of **I**nfectious animal **D**isease introduction

## Background

- Generic risk assessment (RA) tools have been developed
  - To assess the incursion risk of multiple animal diseases
  - To allow for a rapid response to emerging or re-emerging diseases
- Challenges faced by generic RA tools
  - Need for extensive and real-time databases
  - Choice of algorithms to combine input data into an overall risk estimate
  - Validation of results

## Objective

To explore opportunities for validation of generic RA tools by using multiple tools to answer the same risk question

## Comparison of results

### Absolute results

- Number and type of introduction pathways evaluated by the RA tools differed. All tools assessed trade in live animals, trade in animal products, and wild boar movements, except MINTRISK (no animal products) and RRAT (no wild boar)
- RA tools had different endpoints and output parameters (Table 1), making a comparison of absolute results impossible

### Relative results

- Provide an indication of relative risks: Do the RA tools result in the same prioritization of countries and scenarios?
- Comparisons between Finland and the Netherlands (Fig. 1), and between the base scenario and the hypothetical scenarios (Fig. 2), considering the three introduction pathways most in common

### Message to risk manager

- Generic RA tools were developed to inform risk managers on exotic animal disease threats: Similar message = similar decision!
- All RA tools agreed on the message provided to the risk manager (Box 1)

## Case study on African swine fever

- Seven generic RA tools, one risk question
- African swine fever (ASF) incursion risk for the Netherlands and Finland
  - Base scenario: 2017 situation
  - Two hypothetical scenarios
    - S2: ASF in wild boar in Germany (~50 km from Dutch border)
    - S3: ASF in wild boar and domestic pigs (1 mixed farm) in Germany
- Harmonization of input data for disease occurrence and trade



## Conclusions

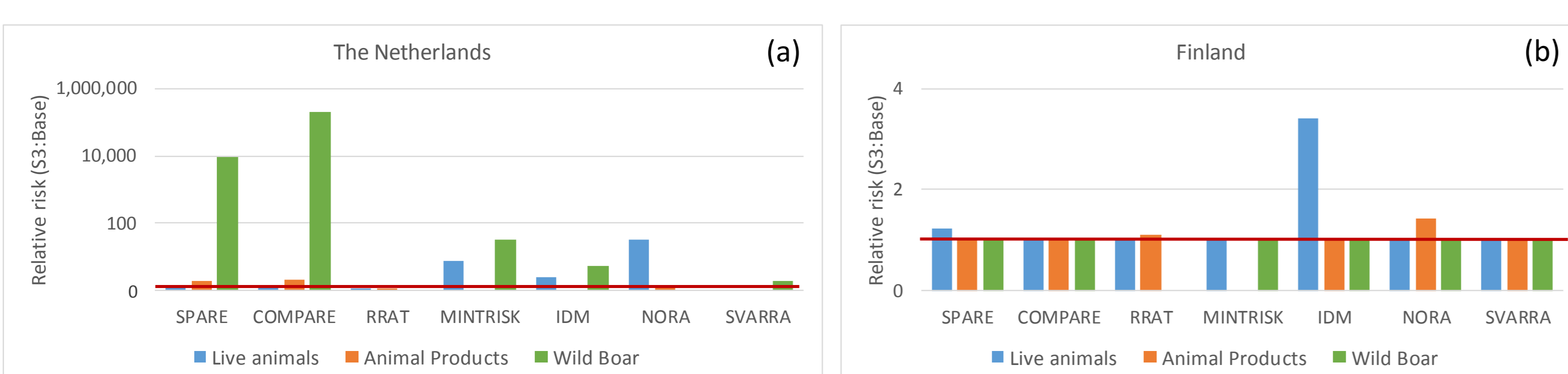
- The generic RA tools were developed for different purposes ranging from response to new outbreaks to horizon scanning
- A comparison of *absolute results* was not possible because of differences in introduction pathways evaluated, endpoints and output parameters
- A comparison of *relative results* indicated that the RA tools mostly agreed on differences in the ASF incursion risk for the Netherlands and Finland, and on changes in the risk due to presence of ASF in Germany
- A comparison of *messages to the risk manager* confirmed that the tools agreed upon the evaluated ASF risk
- The cross-validation contributed to the credibility of the results of the generic RA tools evaluated

### Box 1. Summarizing message to the risk manager based on case study results

- The risk of ASF incursion is higher for the Netherlands than for Finland
- ASF in Germany resulted in an increased risk for the Netherlands, not for Finland



**Figure 1.** Relative risk of introducing ASF into the Netherlands compared to Finland in the base scenario (2017 situation) by (a) trade in live animals, (b) trade in animal products, and (c) movement of wild boar; a relative risk above 1 (red line) denotes the Netherlands has a higher risk than Finland, while a relative risk below 1 denotes Finland has a higher risk.



**Figure 2.** Relative risk of introducing ASF into (a) the Netherlands and (b) Finland in the hypothetical scenario with ASF reported in wild boar and domestic pigs in Germany (S3) compared to the base scenario; a relative risk of 1 (red line) denotes no increased risk

**Table 1.** Output of the seven generic risk assessment tools

TOOL	Type	Endpoint	Output parameter
SPARE	Quantitative	Entry	Number per year
COMPARE	Quantitative	First infection	Annual probability
MINTRISK	Semi-quantitative	First infection	Annual rate, translated into risk score between 0 and 1
RRAT	Semi-quantitative	First infection	Probability-based risk score between 0 and 1
IDM	Semi-quantitative	Exposure	Risk score, translated into qualitative risk category
NORA	Semi-quantitative	First infection	Risk score, translated into qualitative risk category
SVARRA	Qualitative	Exposure	Qualitative risk category

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