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DISEASE RISK ASSESSMENT ON INVASIVE ALIEN SPECIES

EVALUATION OF THE RISK OF INTRODUCTION OF NEW INFECTIONS AND SPREAD OF LOCAL ONES

ELEONORA CHINCHIO*[1], MATTEO CROTTA[2], NICOLA FERRARI[3]

[1, 3] Department of Veterinary Medicine (DIMEVET); Universita' degli Studi di Milano; Via Celoria 10 , 20133 Milano, Italy

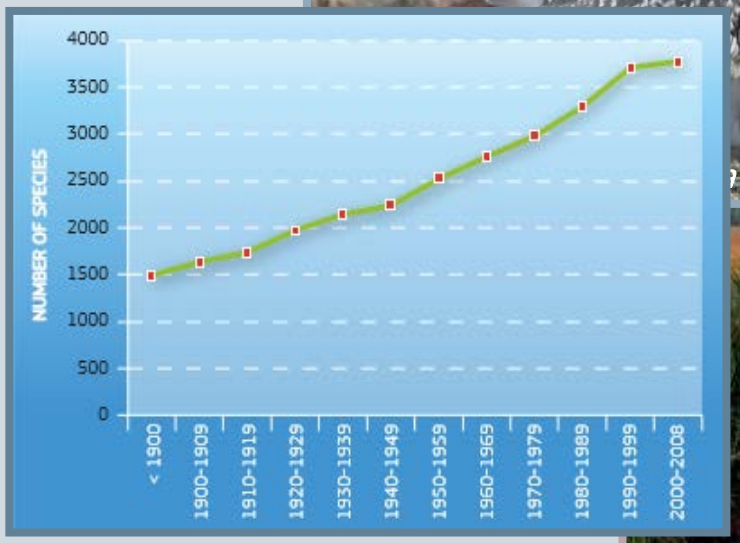
[2] Veterinary Epidemiology, Economics and Public Health Group; The Royal Veterinary College, Hawkshead Lane, North Mymms, AL9 7TA, Hatfield, UK

Invasive alien species (IAS)

- Impacts
  - Health
  - Biodiversity
  - Economy
- Increasing trend
- Reg UE 1143/2014

  Species «of Union concern»

…ting a gannet chick in Scotland



European Environment Agency (May 2010)

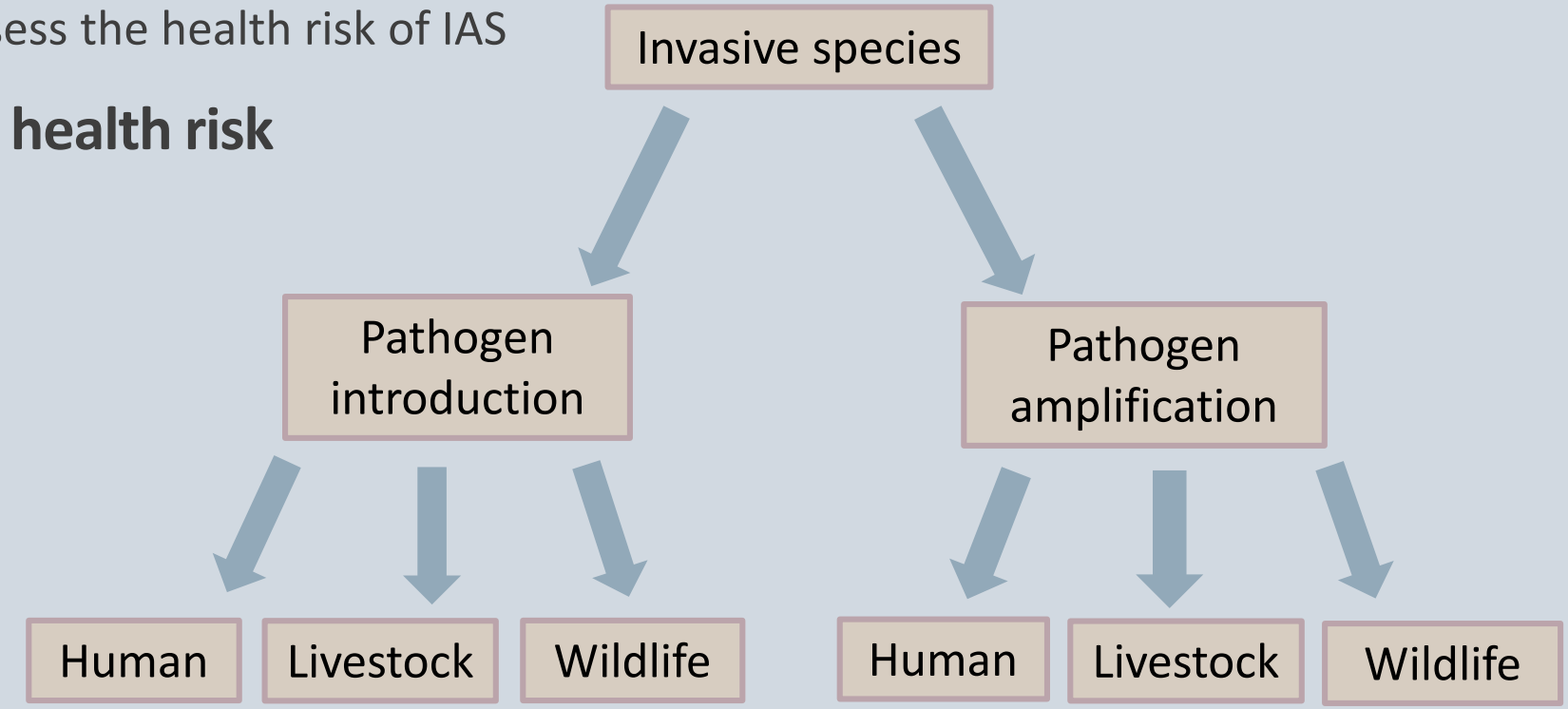
Riverbanks damaged by coypu

Invasive alien species (IAS)

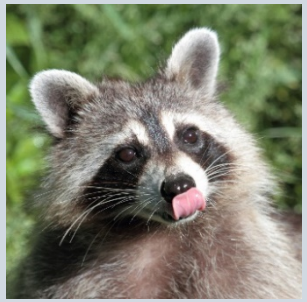
- Aim of the work

  Methodology to assess the health risk of IAS

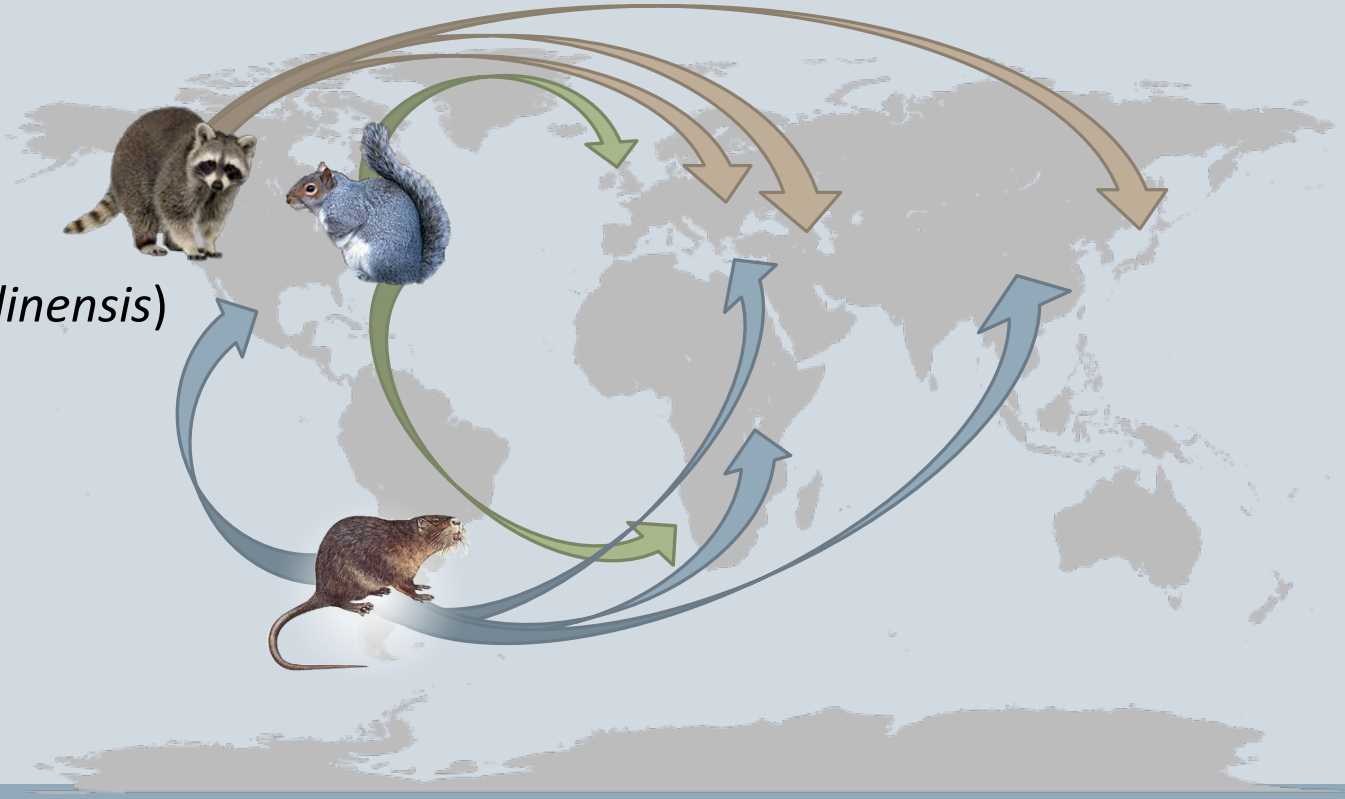
- Invasive species' **health risk**



Materials and methods


- Model species
  - American gray squirrel (*Sciurus carolinensis*)
  - Raccoon (*Procyon lotor*)
  - Coypu (*Myocastor coypus*)



Disease Risk assessment

*Which are the **pathogens** affecting IAS and their effects on animal and human health?*

- Steps
  - Risk question
  - Hazard identification
  - Pathways identification
  - Collection of information
  - Risk assessment

- **Qualitative** Risk Assessment
  - Preliminary context
  - Lack of information

1. Hazard Identification

Bibliographic review on some of the major scientific databases

- Infectious agents
- Infection prevalence
- Infection area

	N° suitable articles	N° infectious agent species
Raccoon	259	197
Gray squirrel	86	136
Coypu	43	44
Total	388	377

2. Risk assessment

Risk = Impact × likelihood

Impact	Consequences	
HIGH	Human	Fatal or disabling
	Livestock	Reg CE 652/2014
	Wildlife	Wildlife populations reduction
MODERATE	Human	Serious but treatable
	Livestock	OIE Notifiable disease
	Wildlife	Influence on wildlife dynamics
LOW	Human	Treatable
	Livestock	Treatable
	Wildlife	Limited influence on wildlife dynamics
NONE	Human	No infection
	Livestock	No infection
	Wildlife	No infection

X

Likelihood	Prevalences
HIGH	≥50%
MODERATE	50%<x≤5%
LOW	<5%
OCCASIONAL	Sporadic reports
NONE	Absent

2. Risk assessment

Risk estimation

Introduction risk		LIKELIHOOD			
		Occasional	Low	Moderate	High
IMPACT	High	Low	Moderate	High	High
	Moderate	Low	Low	Moderate	High
	Low	Insignificant	Low	Low	High
	None	Insignificant	Insignificant	Insignificant	Insignificant

Amplification risk		LIKELIHOOD				
		Absent	Occasional	Low	Moderate	High
IMPACT	High	Low	Low	Moderate	High	High
	Moderate	Insignificant	Low	Low	Moderate	High
	Low	Insignificant	Insignificant	Low	Low	Moderate
	None	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant

→ Total risk

3. Uncertainty

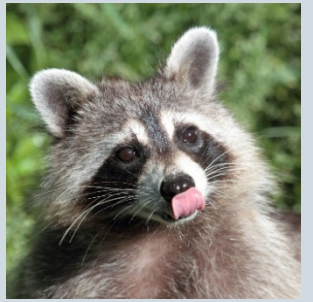
- Amount and quality of the information
- Biological variability of the phenomena

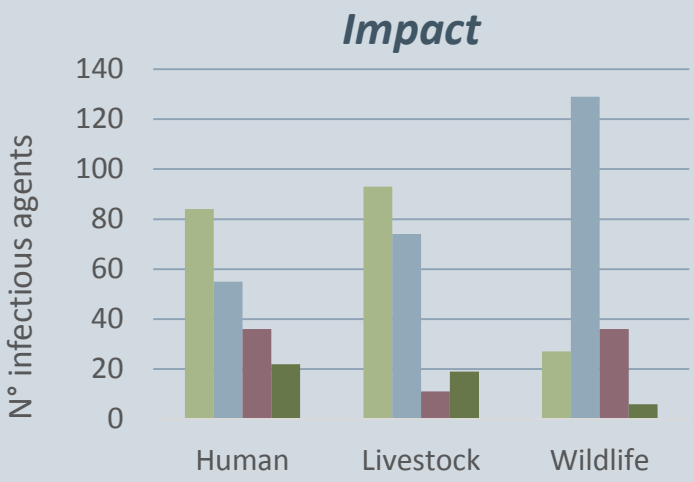
High
Medium
Low

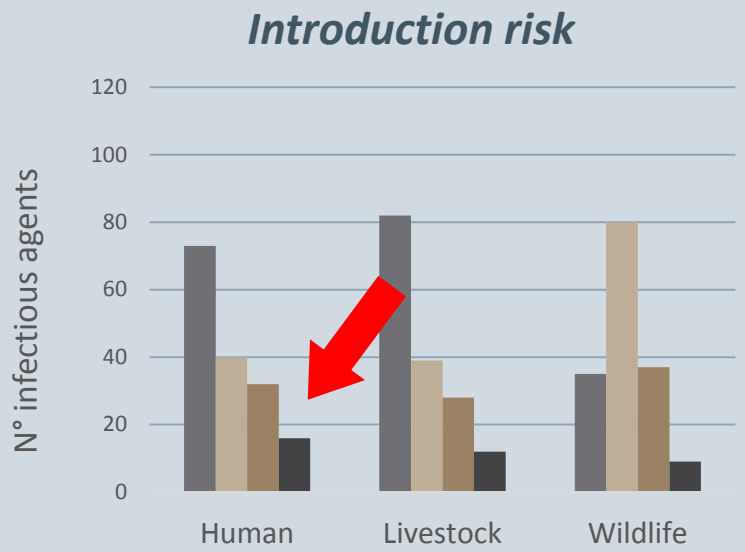
I. Impact uncertainty
II. Likelihood uncertainty

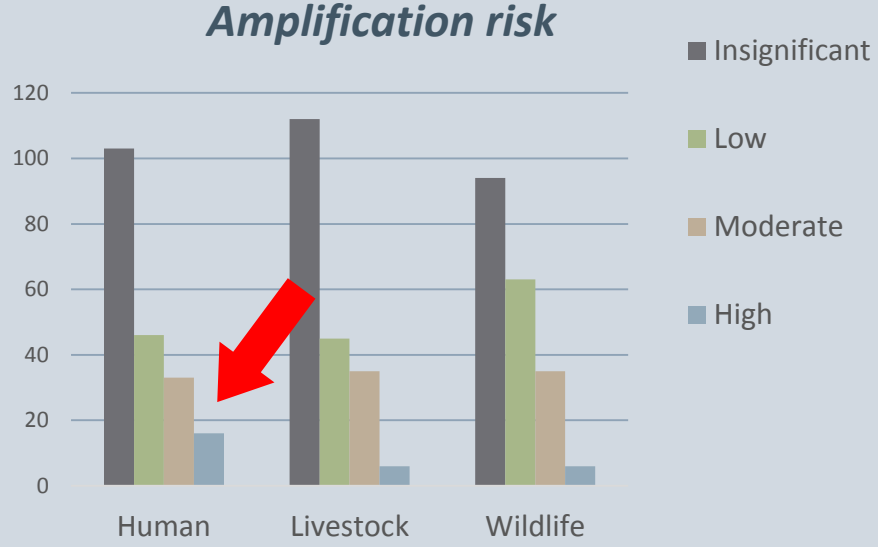
Risk uncertainty

Results




Impact
N° infectious agents
140
120
100
80
60
40
20
0
Human
Livestock
Wildlife
None
Low
Moderate
High


Introduction risk
N° infectious agents
120
100
80
60
40
20
0
Human
Livestock
Wildlife


Amplification risk
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100
80
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40
20
0
Human
Livestock
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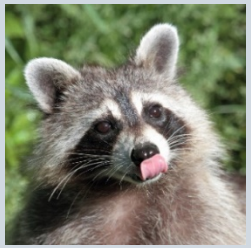
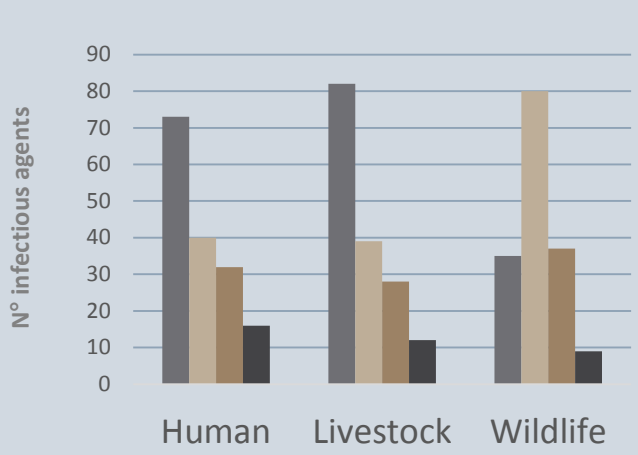
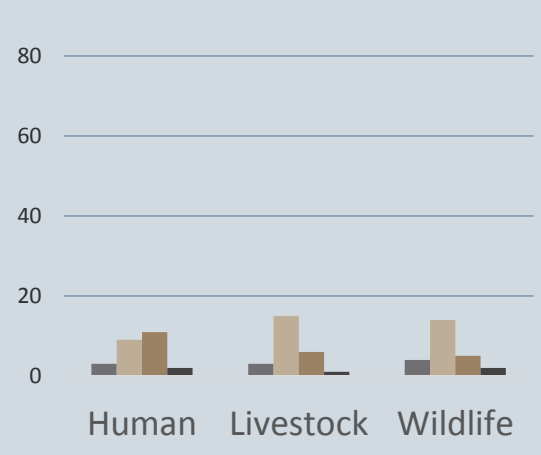
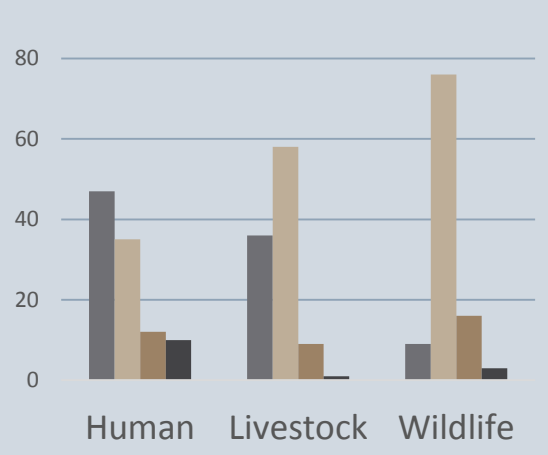
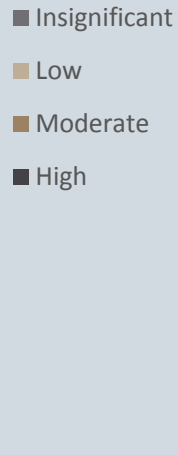


Introduction Risk

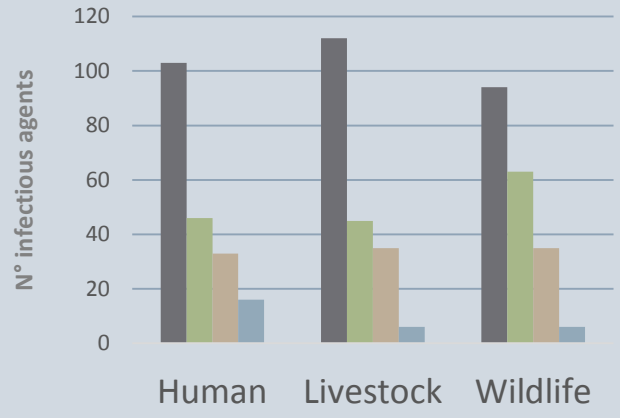


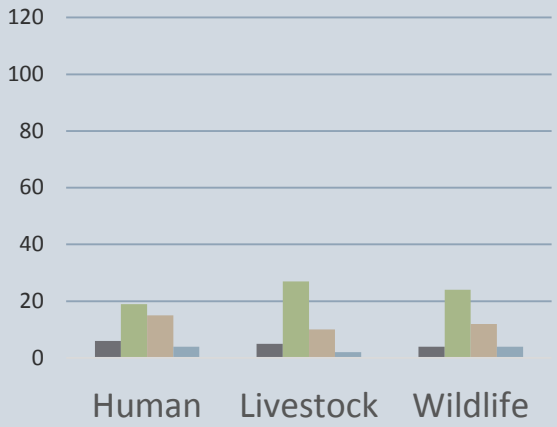


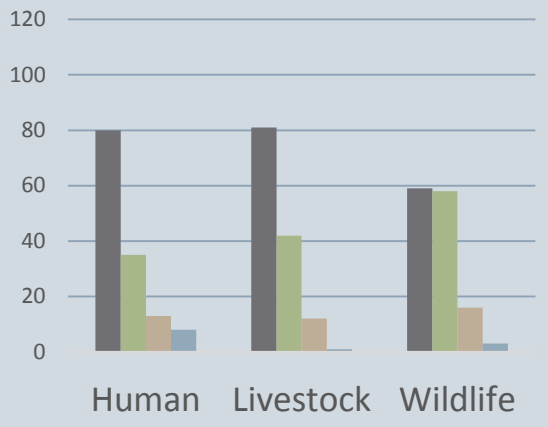




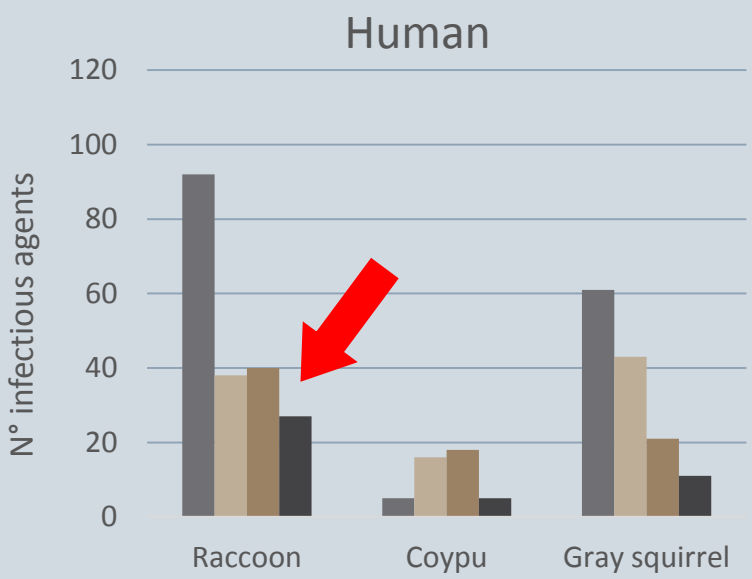
Amplification Risk

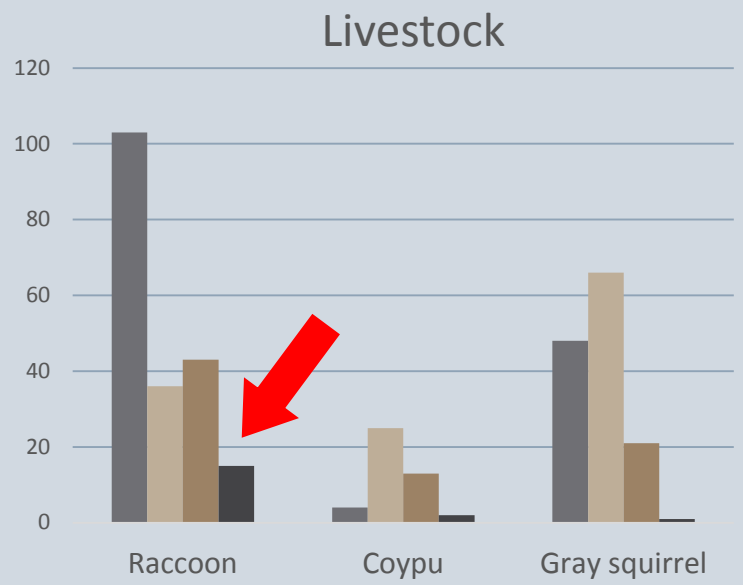


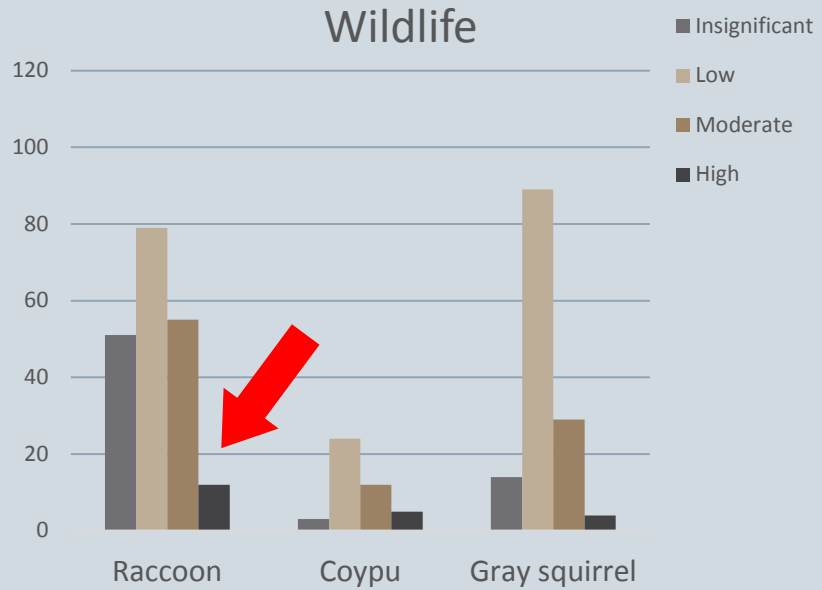


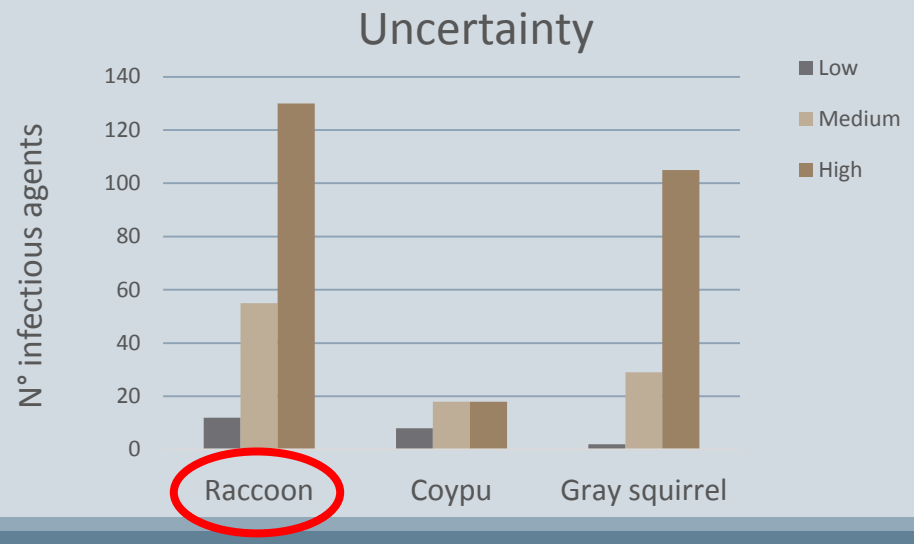


Total risk

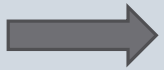

Human
N° infectious agents
120
100
80
60
40
20
0
Raccoon
Coypu
Gray squirrel


Livestock
120
100
80
60
40
20
0
Raccoon
Coypu
Gray squirrel


Wildlife
120
100
80
60
40
20
0
Raccoon
Coypu
Gray squirrel
Insignificant
Low
Moderate
High


Uncertainty
N° infectious agents
140
120
100
80
60
40
20
0
Raccoon
Coypu
Gray squirrel
Low
Medium
High

Discussion

- Definition of a **methodology** to evaluate the health risk of invasive alien species
- Possibility to obtain different type of ***output***:
  - Introduction/amplification risk
  - Risk towards human/livestock/wildlife
- ***Uncertainty*** 
  - Need for insights
  - Precautionary principle
- ***Comunication*** all along the process
- Application of the defined methodology to the most important species in Europe

Thanks for your attention