

# Basic of risk analysis

## Risk analysis of spillover events in wildlife workshop

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**World Organisation  
for Animal Health**

Founded as OIE



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## Summary

- Principles and concepts of risk analysis
- International regulations (WTO SPS)
- Technical standards (Codex, WOAHA)
- Risk management
- Risk communication



- **Hazard vs. Risk**

- Hazard: Potential to cause harm

A biological, chemical or physical agent in, or condition of, food with the **potential** to cause an adverse health effect  
(Codex Alimentarius Commission)

*e.g. Salmonella in food sample spiked for demonstration*

- Risk: Likelihood of occurrence and magnitude of consequences of a specific hazard being realized

*e.g. Salmonella in food on the market*

$$\text{Risk} = f [p(\text{adverse effect}) \times S(\text{adverse effect})]$$

if  $p$  or  $s=0$  : Risk=0

but in general  $p \neq 0$ : a **risk is never zero**



# HAZARD

VS

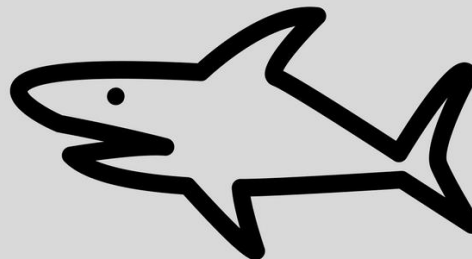
# RISK

A **HAZARD** is something that has the potential to harm you

**RISK** is the likelihood of a hazard causing harm

## Hazard

Something that can potentially cause harm



## Risk



= hazard + exposure



- **Risk analysis**

- analytical process to provide information regarding undesirable events;
- process of estimating probabilities and expected consequences for identified risks
- detailed examination including risk assessment, risk evaluation and risk management alternatives, performed to understand the nature of unwanted outcome

*Society for Risk Assessment*

- It is about making **good decisions (risk management)** with **imperfect knowledge (risk assessment)**



## The World Trade Organization's (WTO) Sanitary and Phytosanitary (SPS) agreement

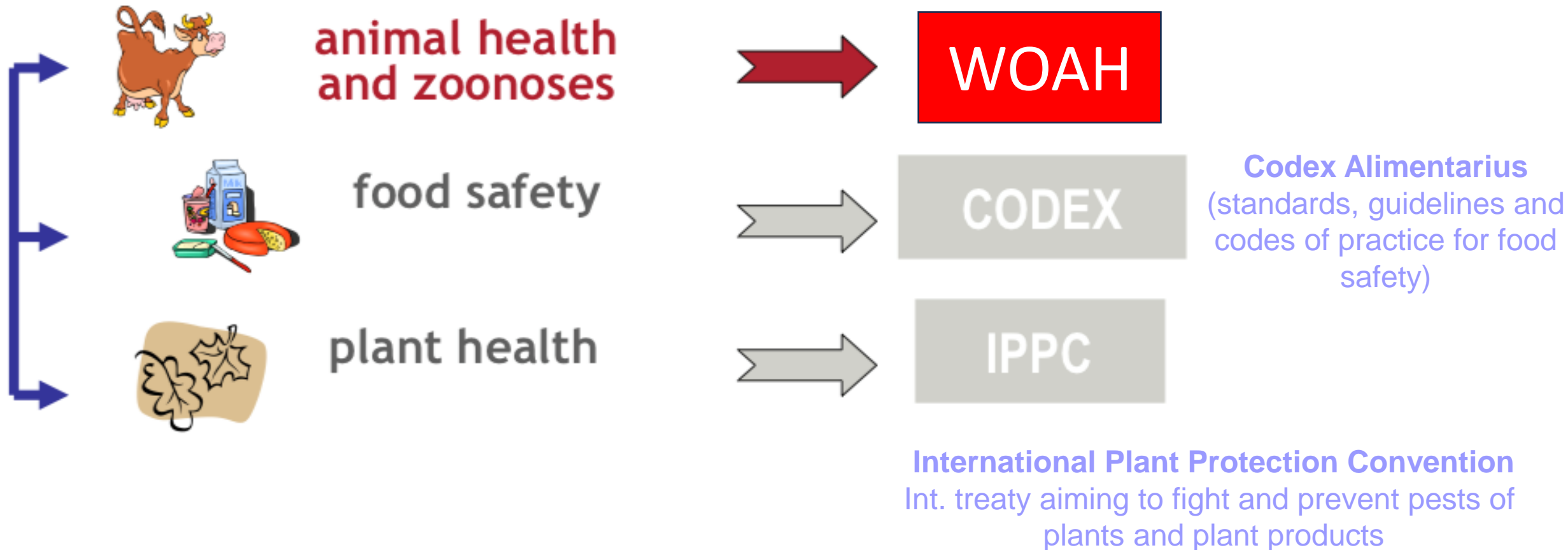
- Sanitary = human & animal health

- Phytosanitary = plant health

- SPS agreement came into force in 1995
- Art 2: WTO members have right to take (phyto)sanitary measures to protect human/ animal/ plant life or health
  - SPS measures include: quarantine or food safety requirements
- Defines 2 types of risk assessment
  - Disease risk assessment (likelihood)
  - Food safety risk assessment (potential for adverse effects)



- **Standard setting organizations**



## WOAH vs. Codex risk assessment approach

- WOAHA = **disease** RA
  - Versatile
  - Used to address risk questions of different types
  - AIM: assure transparency regarding animal health and zoonosis in relation to **trade**
- Codex = **food safety** RA
  - Designed to answer questions in relation to maximum levels of substances or pathogens
  - Main focus: Microbiological food safety assessment
  - AIM: **protect human health**





- **Risk analysis (WOAH)**

### The four components of a risk analysis

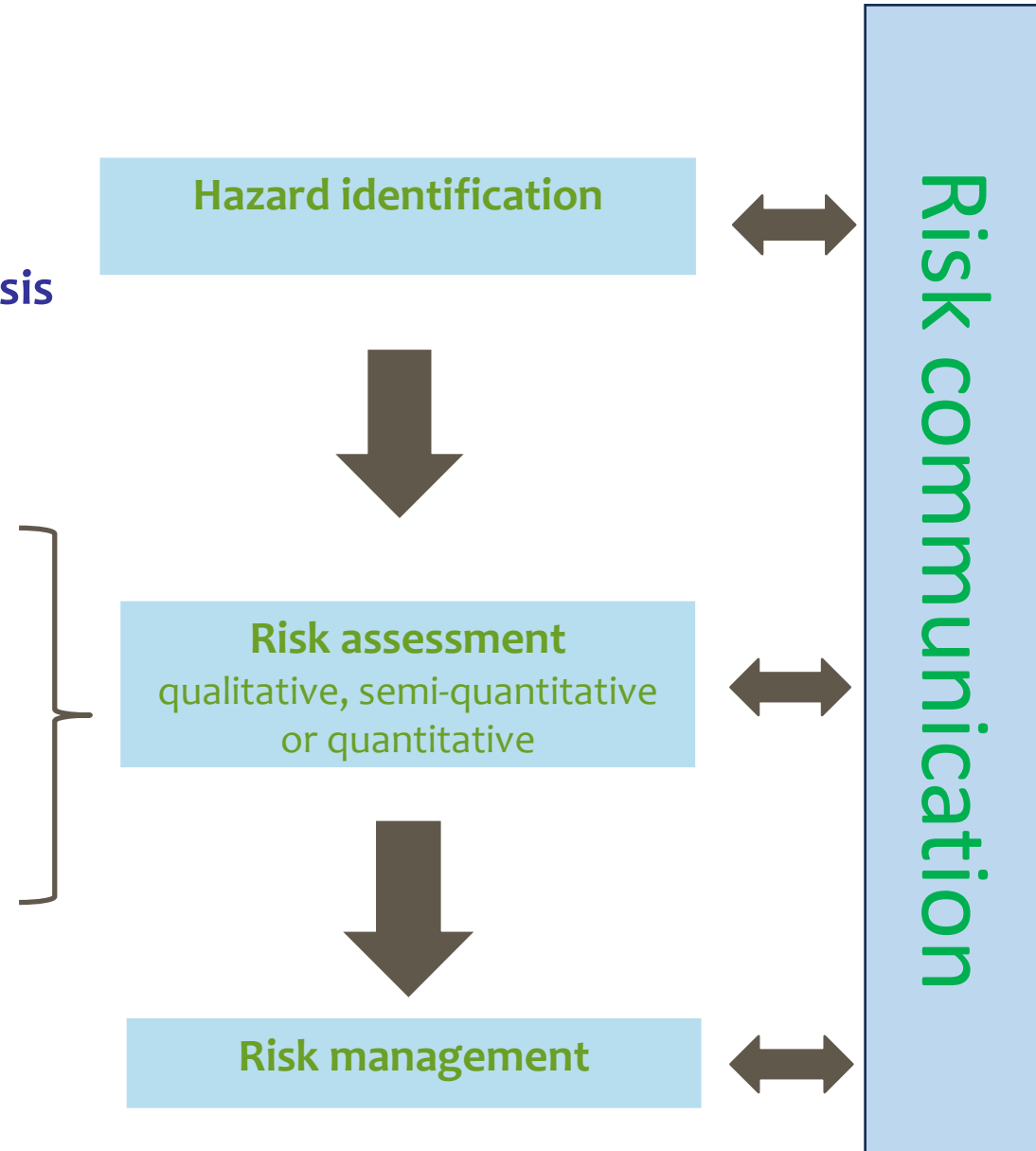
(terrestrial animal health code, (WOAH, 2023))

Release assessment

Exposure assessment

Consequence assessment

Risk estimation





- **WOAH risk assessment**

- 1) Release assessment**

Description of biological pathways for release of hazard and estimation of its probability

- 2) Exposure assessment**

Description of biological pathways necessary for exposure of humans/ animals to the hazards released and estimation of its probability

- 3) Consequence assessment**

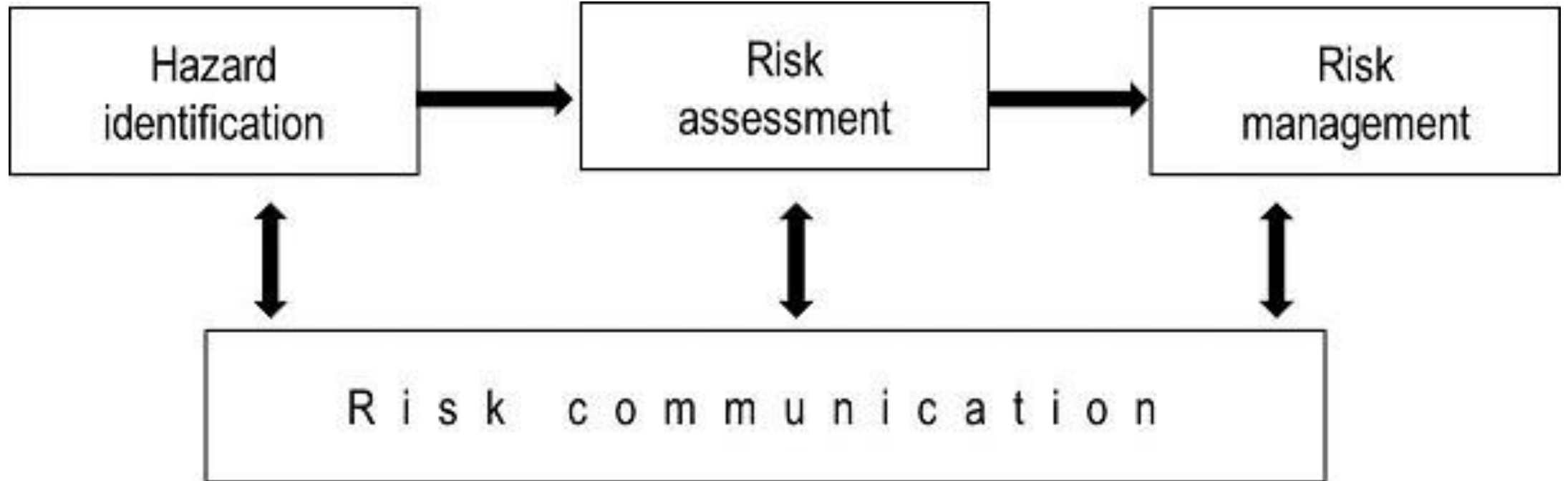
Description of relationships between exposures to hazards and consequences of those exposures (biological and economic)

- 4) Risk estimation**

Integration of results from previous three steps to produce overall measure of risk associated with the hazards



## Risk analysis components





- **Risk assessment**

Evaluating likelihood and biological/economic consequences of entry, establishment or spread of a pathogenic agent within the territory of an importing country



- **Risk assessment**

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Separate from risk management

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Objective to be defined

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Scientific, structured, transparent

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Limitations clearly described

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Data uncertainty ascertainable

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Measure for uncertainty in the result

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Documented



- Risk management

Deciding upon and implementing measures to achieve the importing country's appropriate level of protection, whilst ensuring that negative effects on trade are minimized.



- Risk management

## 4 components

**1. Risk evaluation:** estimated risk compared with importing country's **appropriate level of protection (ALOP)**

**2. Option evaluation:** measures evaluated and selected to effectively manage risks in line with importing country's appropriate ALOP

**3. Implementation**

**4. Monitoring and review:** measures are audited to ensure that they are achieving the results intended



- **Principles of risk management**



**Separate from  
risk assessment**



**Documentation**



**Transparency**



**Consistency**



**Minimal  
restrictions**



**Iterative  
(review –  
decide – act)**



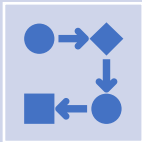
**No hidden  
trade barriers**



## Risk communication



Information exchange between risk assessors, risk managers and those affected by both the risk and the decisions taken before the final policy decisions are taken



Multidimensional, iterative process, should begin at start of risk assessment process and continue throughout



Important: Human behavior is not dependent on facts, but on perceptions



- **Risk perception**

- Low if...

- Own choice, natural cause, own advantage, even distribution, well known, adults are affected

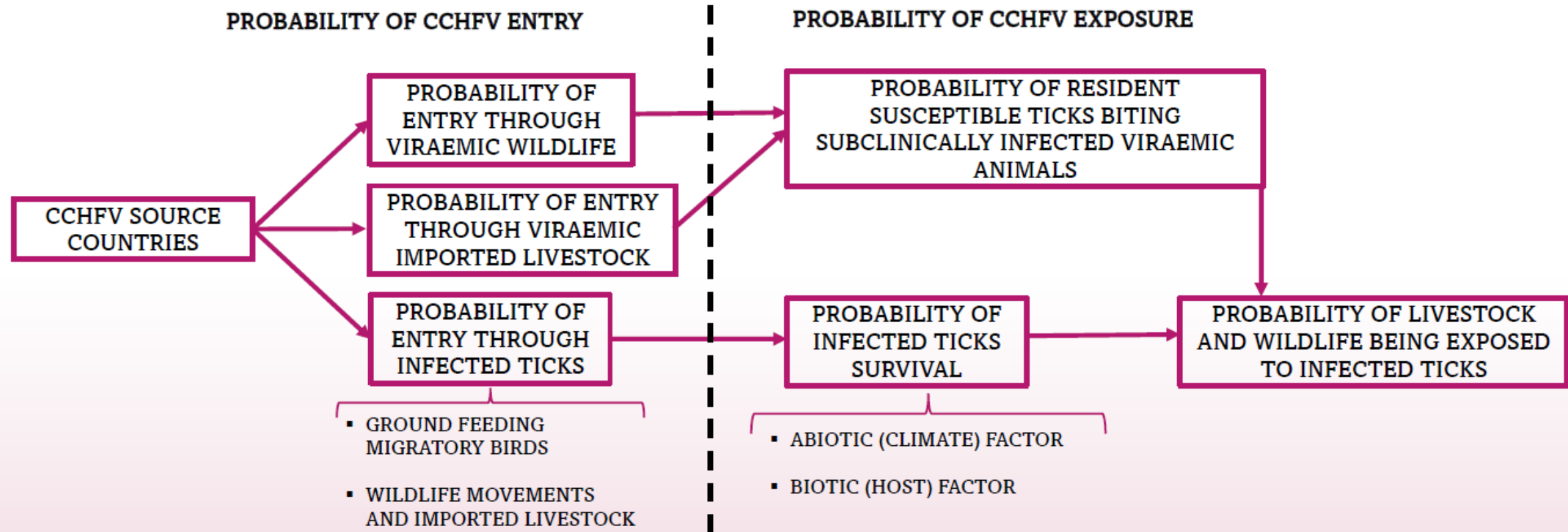
- High if...

- Involuntary, forced or controlled by third party, man-made, no advantage, affects only select circle, unknown, affects children



## • Practical example

### RISK PATHWAY



### RESULTS & DISCUSSION

# Thank you



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