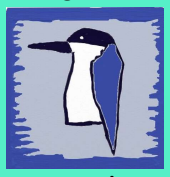
Using a sociological approach to Animal Value Chain Analysis for risk management.

Risk analysis is looking for the predictable surprises: the disasters you should have seen coming.

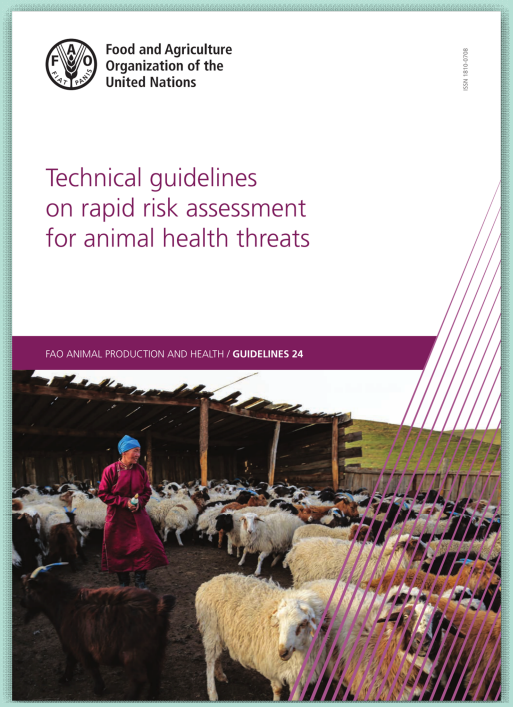
Little Kingfisher Group



Homan Anderson

Today's agenda:

1. **Recap of the stages in the modules**
2. **A description of the processes for risk analysis on risk pathways**
3. **Example of conducting qualitative risk analysis on risk pathways**
4. **Practice using risk analysis processes related to value chains and risk pathways**
5. **Look at the next and final module.**



This is the risk analysis matrix that we will use in our modules. Note that there are many other variations. Different ones will be appropriate for different situations. This is quite simple to show the principles involved.

	Consequence rating	Consequence description
1	Negligible	Virtually no commercial impact, 1 property or less
2	Minor	Disease on a few properties, easily controlled
3	Moderate	Effects on community; financial/ public health
4	Major	High economic effect on region/ public health
5	Catastrophic	National effects; major economic/ public health

	Likelihood rating
A	Almost certain
B	Likely
C	Possible
D	Unlikely
E	Rarely if ever would occur

L-Likelihood Rating	C – Consequence Rating 1	2	3	4	5
A	M	M	H	X	X
B	L	M	M	H	X
C	L	L	M	H	H
D	N	L	M	M	H
E	N	N	L	M	H

Level of Risk Rating	Response
X - Extreme	Urgent attention
H - High	Intervention required
M - Medium	Active management
L - Low	Ongoing monitoring
N - Negligible	Acceptable risk

Module 4 – Combining risk analysis with animal value chain analysis.

Decide which diseases and/or species are you interested in

Describe the ways those diseases can be spread

Collect data on the value chain for animals and products that can spread diseases

Draw a value chain for those animals and products to show the risk pathways

Conduct a risk analysis for each of those pathways

Look at possible control measures along the risk pathways

Module 2 Use a Sociological Approach

Module 4

Module 5

RISK QUOTE

"The first step in the risk management process is to acknowledge the reality of risk. Denial is a common tactic that substitutes deliberate ignorance for thoughtful planning."

Charles Tremper - author on law and risk management

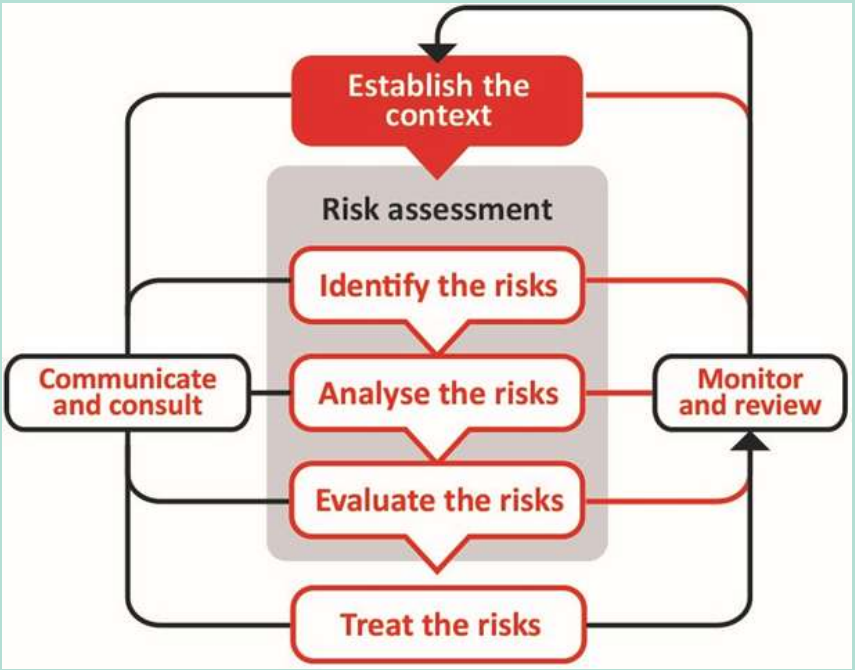
- The principles of risk analysis can be applied to disease management in value chains.
- Value chain risk analysis adopts the same principles and tools as those used in standard risk analysis.
- Qualitative risk analysis provides a logical and uniform framework for decision-making.
- It can be used to support decisions that allow certain activities under certain conditions or, alternatively, that prohibit activities because no practical risk reduction measures are identified or needed.

Technical guidelines on rapid risk assessment for animal health threats

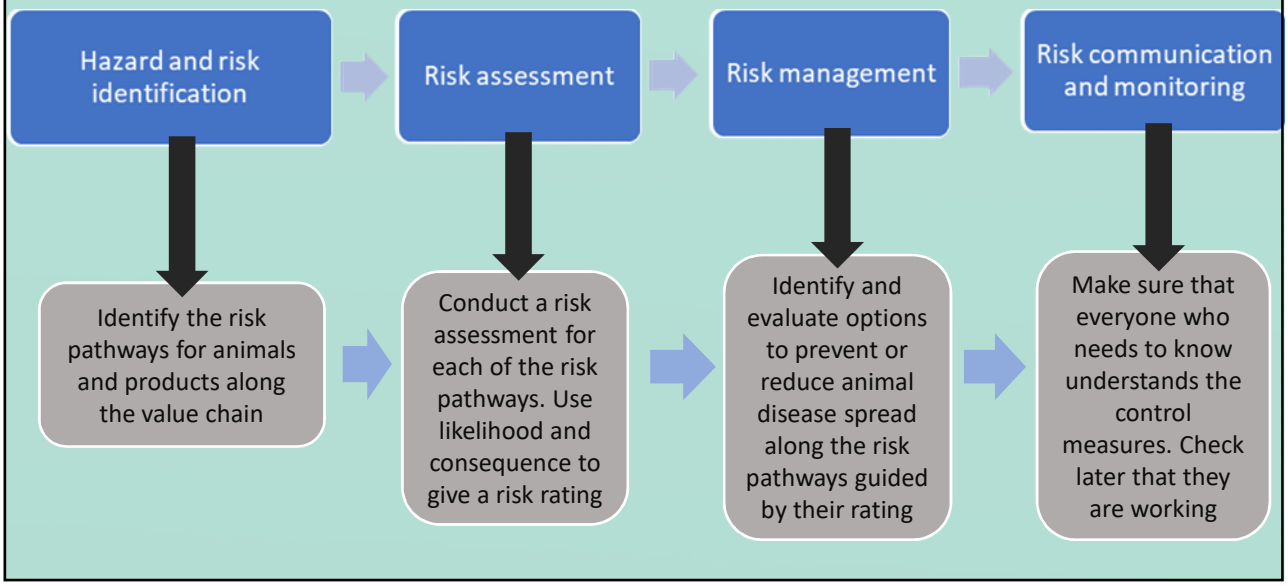
FIGURE 1
Four main components of the risk analysis process

Source: FAO, 2012.

Generic risk analysis components



Components of risk analysis for value chain animal disease spread



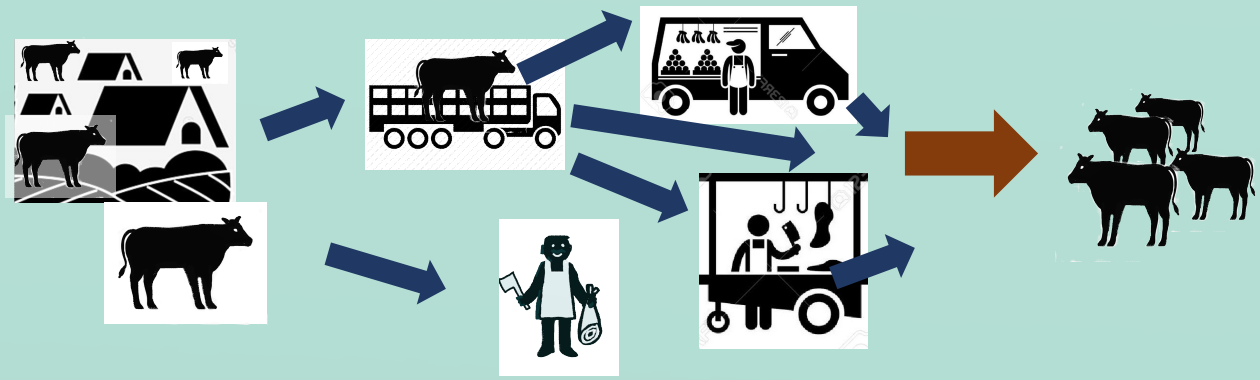
NOTE:

Risk assessment can be conducted in many ways.

This module will describe a practical qualitative risk analysis process for animal diseases.

This will be linked to animal and product movement and risk pathways.

Taking into account known methods of disease transmission for specific diseases, what risk of disease spread do each of the value chain movements/risk pathways pose and what measures can be implemented to prevent, or minimise the effect of, those animal diseases for each pathway, in line with the level of risk?



DR RISK

What's risk management all about? Ask these questions:

1. **What are we trying to achieve?** – objectives
2. **What might affect us?** –identification of risks
3. **Which are these risks are most important?** – likelihood and consequence to rate the risks
4. **What shall we do about them?** – risk treatment according to level of risk
5. **Did what we did work?** – assess effectiveness
6. **What changed?** – monitor the risks.

https://www.youtube.com/watch?v=BLAEuVSAlVM

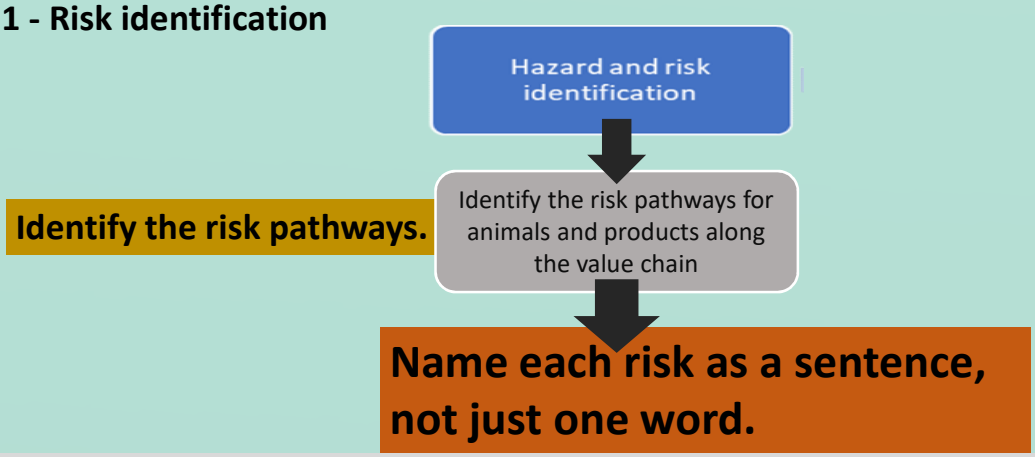
For transborder animal disease management we could say:

1. **What are we trying to achieve?**
   To keep animals and people healthy
2. **What might affect us?**
   Specific diseases entering through risk pathways
3. **Which are these risk pathways are most important?**
   Using likelihood of disease spread and consequence of disease entry, rate the risk pathways
4. **What shall we do about them?**
   Implement disease controls appropriate to the level of risk
5. **Did what we did work?**
   Monitor the effectiveness of the disease controls
6. **What changed?**
   Monitor changes in the value chains/ risk pathways.

STEPS IN RISK ANALYSIS

1a. Identify the risk pathways
1b. Name the specific risk for each of the pathways
2a. Assess the likelihood of each of those risks
2b. Assess the consequence of each risk
2c. Calculate a level of risk rating for each risk
2d. Determine the type of response that is required for each risk
3. Prioritise the risks and work through appropriate treatments by priority.
4. Communicate and monitor risks and treatments.

STEP 1 - Risk identification



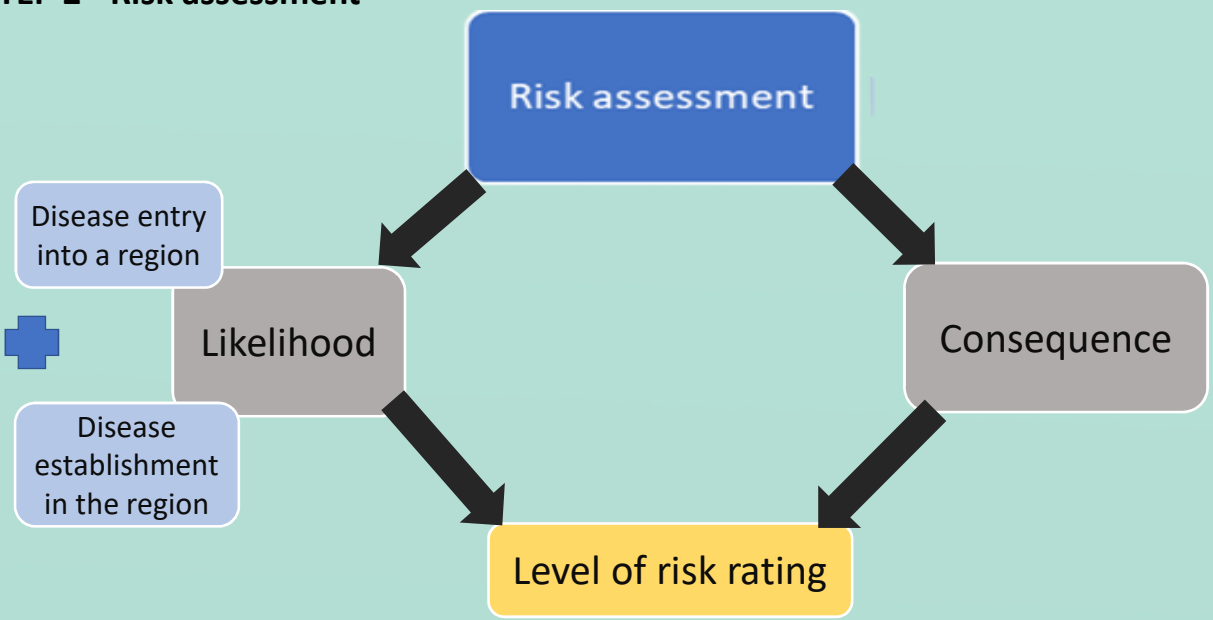
For example:

The risk of Classical Swine Fever being spread into Country B through breeder pigs brought in under permit from Country A.

Or:

The risk of Classical Swine Fever being spread into Country B through uncleaned, empty animal transport vehicles coming into Country B from Country A to transport pigs there.

STEP 2 - Risk assessment



Risk assessment

	Consequence rating	Consequence description
1	Negligible	Virtually no commercial impact, 1 property or less
2	Minor	Disease on a few properties, easily controlled
3	Moderate	Effects on community; financial/ public health
4	Major	High economic effect on region/ public health
5	Catastrophic	National effects; major economic/ public health

	Likelihood rating
A	Almost certain
B	Likely
C	Possible
D	Unlikely
E	Rarely if ever would occur

L-Likelihood Rating	C – Consequence Rating 1	2	3	4	5
A	M	M	H	X	X
B	L	M	M	H	X
C	L	L	M	H	H
D	N	L	M	M	H
E	N	N	L	M	H

Level of Risk Rating	Response
X - Extreme	Urgent attention
H - High	Intervention required
M - Medium	Active management
L - Low	Ongoing monitoring
N - Negligible	Acceptable risk

STEP 2a – Likelihood of entry and establishment;
FAO Guidelines FMD

i) **Entry assessment**: this step consists of determining the likelihood of an imported (or moved) commodity being infected or contaminated with FMDV and describing the biological pathway(s) necessary for FMDV to be introduced into a particular environment.

ii) **Exposure assessment**: this step consists of describing the biological pathway(s) necessary for exposure of animals and humans in the importing country (or area) to FMDV and estimating the likelihood of those exposure(s) occurring.

STEP 2a – Likelihood

Qualitative analysis results in judgemental categorization of likelihood of an unwanted out-come occurring (e.g. very low, low, medium and high). An example of this as used by Defra in the United Kingdom (Defra, 2002) provides the following guidance as to the meaning of the different levels of likelihood:

Likelihood		Descriptor
VL	very low	*Rare* (risky event may occur in exceptional circumstances)
L	low	*Possible* (the risky event may occur in the next three years)
M	medium	*Likely* (the risky event is likely to occur more than once in the next three years)
H	high	*Almost certain* (the risky event is likely to occur this year or at frequent intervals)

Likelihood

TABLE 3. DEFINITION OF LIKELIHOOD CATEGORIES FOR THIS QUALITATIVE ASSESSMENT
USDA

Term	Definition
Negligible	This event would almost certainly never occur
Low	This event would be unlikely to occur
Moderate	This event would be nearly as likely to occur as not to occur
High	This event would be likely to occur
Very High	This event is almost certain to occur

Rating the likelihood.

Table 1: Suggested risk categories for qualitative risk analysis (Weiland, et al., 2015)

Risk category	Description
Negligible	The event is so rare that it does not merit to be considered
Very low	The event is rare but cannot be excluded
Low	The event is rare but does occur
Medium	The event occurs regularly
High	The event occurs very often
Very high	The event occurs almost certainly

	Likelihood rating
A	Almost certain
B	Likely
C	Possible
D	Unlikely
E	Rarely if ever would occur

STEP 2b – Consequence

Rating	Consequence	Consequence Description
1	Insignificant	Negligible commercial impact, single property or contained, low financial loss
2	Minor	Plant pest on a few properties, medium financial loss
3	Moderate	Widespread pest, high economic loss, high financial loss, limited public health risk
4	Major	Major public health risk; high economic implications / trade risk to region/state
5	Catastrophic	Major national economic implications; significant public health risk and/or human deaths

FAO Risk analysis consequence ratings example

NEGLIGIBLE CONSEQUENCE

Impact estimate	Criteria	Direct examples	Indirect examples (economic, social, environmental)
Negligible	The situation described in the risk assessment question will have insignificant NEGATIVE consequences on the health (or health system) of the population	• No human case reports and no, or low number of, localized animal case reports (domestic or wildlife)	• No threat to food security or the economy • Few measures needed at sub-regional or lower level; minor costs of measures implemented at sub-regional level • Similar level of disruptions in other sectors

MINOR CONSEQUENCE

Impact estimate	Criteria	Direct examples	Indirect examples (economic, social, environmental)
Minor	The situation described in the risk assessment question will have marginal NEGATIVE consequences on the health (or health system) of the population	• Rare human case reports (mainly in small at-risk groups) with rare mortality, and low number of animal case reports (domestic or wildlife), with low mortality • Small areas affected (regional level or below)	• No threat to food security or the economy • Measures needed at regional level with low to moderate costs • Similar level of disruptions in other sectors

MODERATE CONSEQUENCE

Impact estimate	Criteria	Direct examples	Indirect examples (economic, social, environmental)
Moderate	The situation described in the risk assessment question will have significant NEGATIVE consequences on the health (or health system) of the population	• Case reports in several regions with significant mortalities in the human population (or medium at-risk groups) or animal population (domestic and wildlife)	• May be a threat to food security or food supplies and indirectly human livelihoods at regional level • Threat mainly to national trade but maybe also to international trade in specific products produced in the affected regions (e.g. foie gras and avian influenza) • Several measures needed at regional and national levels involving major costs • Similar level of disruption in other sectors

SEVERE CONSEQUENCE

Impact estimate	Criteria	Direct examples	Indirect examples (economic, social, environmental)
Severe	The situation described in the risk assessment question will have substantial NEGATIVE consequences on the health (or health system) of the population	• Potential pandemic in the human population (or large at-risk groups) or animal population (domestic and wildlife) with high mortality; significant livestock production losses at national and international levels • Severe disruption of normal activities and services	• Threat to national and international trade: losses of market shares, importation bans in other countries, drop in product prices (meat, eggs) • Large number of measures needed at national and international levels with significant cost for authorities and stakeholders • Threat to food security and/ or food supplies and indirectly human livelihoods at national level • Similar level of disruptions in other sectors

Consequence.

	Consequence rating
1	Negligible
2	Minor
3	Moderate
4	Major
5	Catastrophic

STEP 2c - Calculating the final risk rating for each risk pathway.

	Consequence rating
1	Negligible
2	Minor
3	Moderate
4	Major
5	Catastrophic

	Likelihood rating
A	Almost certain
B	Likely
C	Possible
D	Unlikely
E	Rarely if ever would occur

L-Likelihood Rating	C – Consequence Rating 1	2	3	4	5
A	M	M	H	X	X
B	L	M	M	H	X
C	L	L	M	H	H
D	N	L	M	M	H
E	N	N	L	M	H

Level of Risk Rating

X - Extreme

H - High

M - Medium

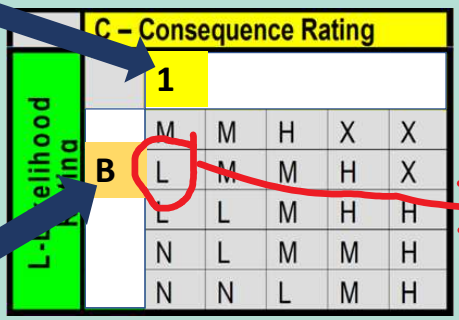
L - Low

N - Negligible

Risk rating example: Likely with Negligible consequence. **=LOW Risk**

	Consequence rating
1	Negligible
2	Minor
3	Moderate
4	Major
5	Catastrophic

	Likelihood rating
A	Almost certain
B	Likely
C	Possible
D	Unlikely
E	Rarely if ever would occur

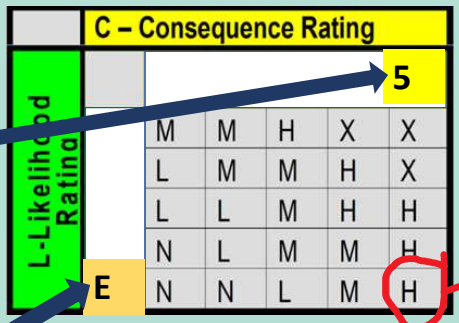


Level of Risk Rating
X - Extreme
H - High
M - Medium
L - Low
N - Negligible

Risk rating example: Rare with Catastrophic consequence. **=HIGH Risk**

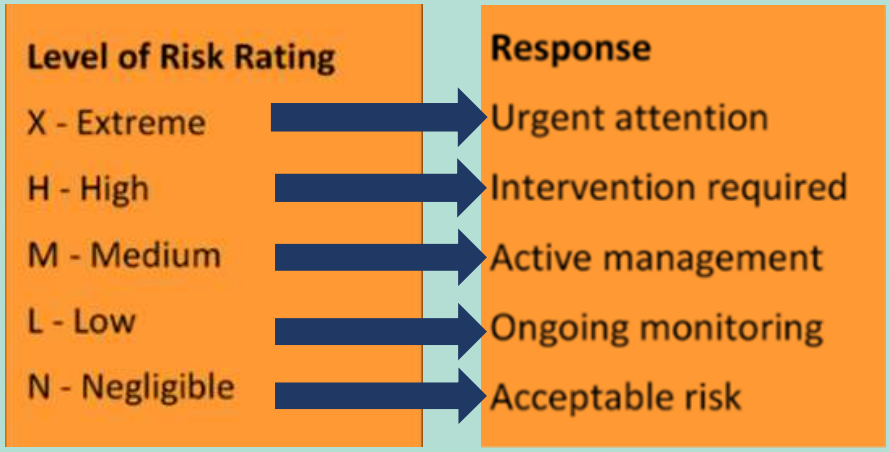
	Consequence rating
1	Negligible
2	Minor
3	Moderate
4	Major
5	Catastrophic

	Likelihood rating
A	Almost certain
B	Likely
C	Possible
D	Unlikely
E	Rarely if ever would occur

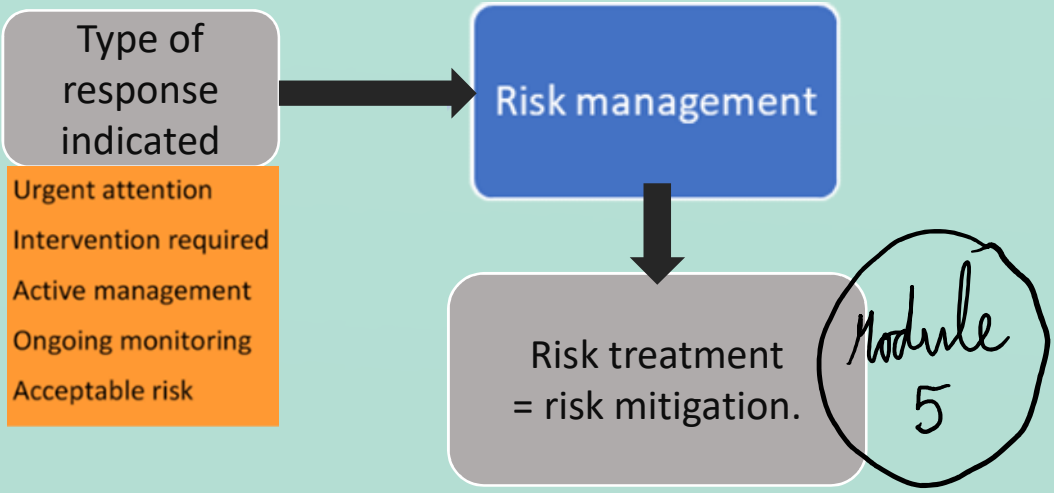


Level of Risk Rating
X - Extreme
H - High
M - Medium
L - Low
N - Negligible

STEP 2d - Calculating the type of response needed for each risk pathway.



STEP 3 – Developing risk treatments based on risk analysis.



STEP 4

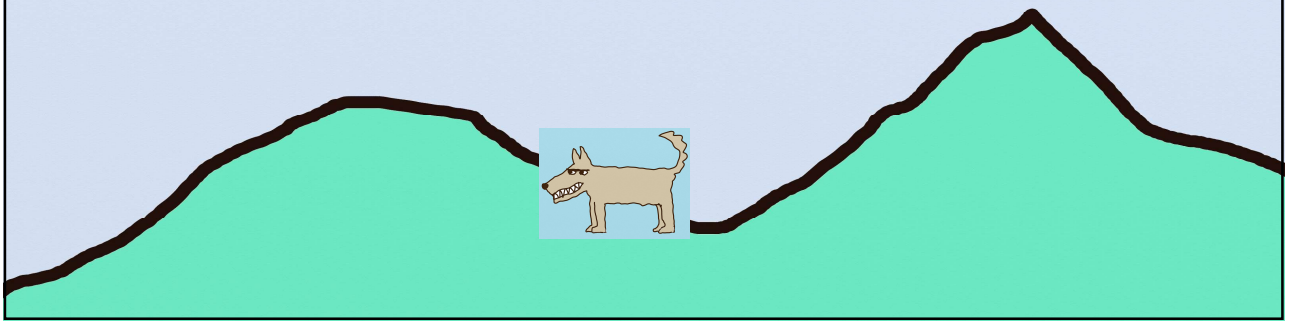
Risk communication and monitoring

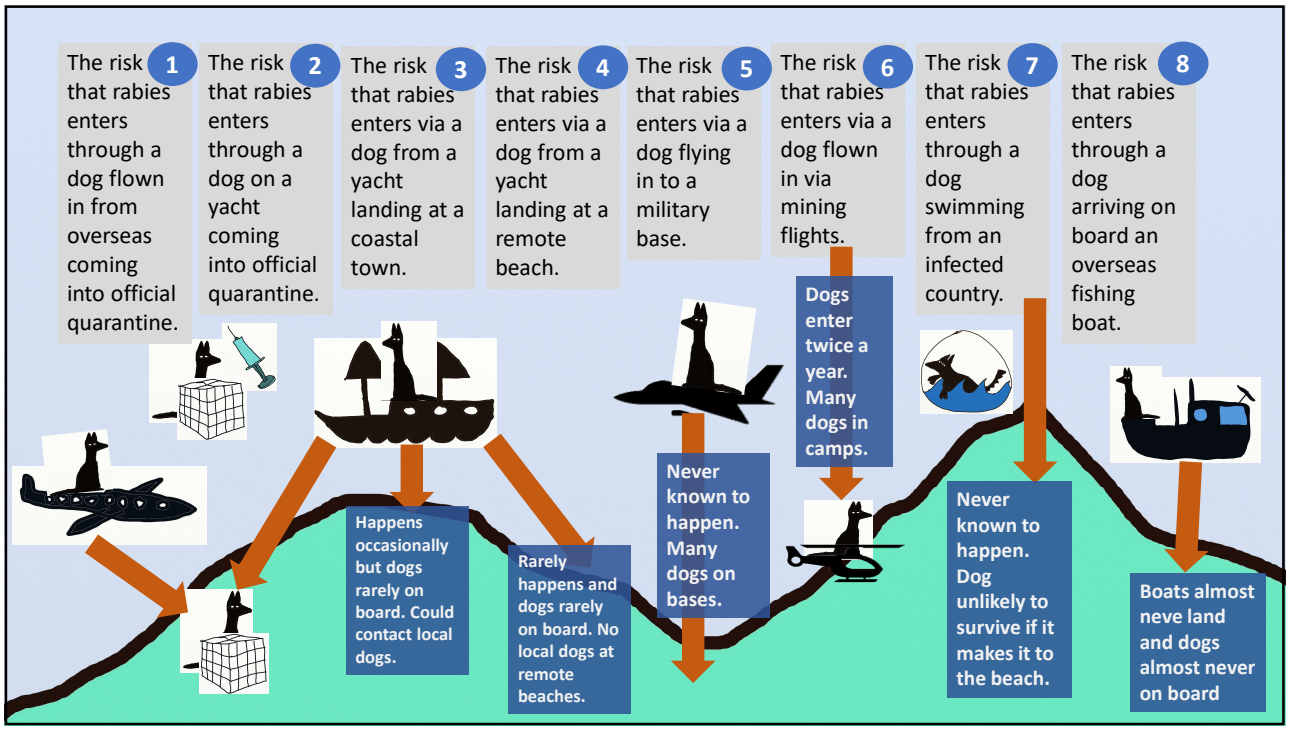
Who needs to know about the processes put in place?	How do you tell if the actions taken are reducing the risk?	How do you monitor if the risks have changed?
Staff. **Affected people.**	**Near misses.** **Cases.**	**Consider disease levels.** **Check value chains.**

EXAMPLES OF RISK ANALYSIS OF RABIES ENTERING A RABIES FREE ISLAND COUNTRY

Following is a simple example of a risk analysis for rabies being introduced into a rabies-free island country, by assessing the likelihood and the consequence for 8 different pathways.

Generally the consequence of a transboundary emergency animal disease **establishing** in a previously disease-free country would always be "catastrophic". However, to demonstrate the process of risk assessment with a varying likelihood and consequence, for this example we have chosen to assess the risk of a rabies infected dog **entering** (not establishing in) the country.





Risk analysis related to the risk of a **rabies infected dog entering the country**

	The risk that rabies enters through a dog flown in from overseas coming into official quarantine.	The risk that rabies enters through a dog on a yacht coming into official quarantine.	The risk that rabies enters via a dog from a yacht landing at a coastal town.	The risk that rabies enters via a dog from a yacht landing at a remote beach.	The risk that rabies enters via a dog flying in to a military base.	The risk that rabies enters via a dog flown in via mining flights.	The risk that rabies enters through a dog swimming from an infected country.	**The risk that rabies enters through a dog arriving on board an overseas fishing boat.**
Likelihood	**E Rare**	**E Rare**	**D Unlikely**	**E Rare**	**E Rare**	**B Likely**	**E Rare**	**E Rare**
Consequence	2 Minor	2 Minor	4 Major	3 Moderate	4 Major	4 Major	1 Negligible	**1 Minor**
RISK RATING	Low	Low	**Medium**	Low	**Medium**	**High**	Negligible	**Low**
Response	Monitor	Monitor	**Active**	Monitor	**Active**	**Intervention**	Accept	**Monitor**

	Likelihood rating
A	Almost certain
B	Likely
C	Possible
D	Unlikely
E	Rarely if ever would occur

	Consequence rating
1	Negligible
2	Minor
3	Moderate
4	Major
5	Catastrophic

L-Likelihood Rating	C – Consequence Rating 1	2	3	4	5
A	M	M	H	X	X
B	L	M	M	H	X
C	L	L	M	H	H
D	N	L	M	M	H
E	N	N	L	M	H

Level of Risk Rating	
X - Extreme	Urgent attention
H - High	Intervention required
M - Medium	Active management
L - Low	Ongoing monitoring
N - Negligible	Acceptable risk

Risk analysis related to the risk of a **rabies establishing in the country through each pathway**

	The risk that rabies enters through a dog flown in from overseas coming into official quarantine.	The risk that rabies enters through a dog on a yacht coming into official quarantine.	The risk that rabies enters via a dog from a yacht landing at a coastal town.	The risk that rabies enters via a dog from a yacht landing at a remote beach.	The risk that rabies enters via a dog flying in to a military base.	**The risk that rabies enters via a dog flown in via mining flights.**	The risk that rabies enters through a dog swimming from an infected country.	The risk that rabies enters through a dog arriving on board an overseas fishing boat.
Likelihood	**E Rare**	**E Rare**	**D Unlikely**	**E Rare**	**E Rare**	**B Likely**	**E Rare**	**E Rare**
Consequence	5 Catastrophic	5 Catastrophic	5 Catastrophic	5 Catastrophic	5 Catastrophic	5 Catastrophic	5 Catastrophic	**5 Catastrophic**
RISK RATING	High	High	High	High	High	**Extreme**	High	High
Response	Intervention	Intervention	Intervention	Intervention	Intervention	**URGENT**	Intervention	Intervention

	Likelihood rating
A	Almost certain
B	Likely
C	Possible
D	Unlikely
E	Rarely if ever would occur

	Consequence rating
1	Negligible
2	Minor
3	Moderate
4	Major
5	Catastrophic

L-Likelihood Rating	C – Consequence Rating 1	2	3	4	5
A	M	M	H	X	X
B	L	M	M	H	X
C	L	L	M	H	H
D	N	L	M	M	H
E	N	N	L	M	H

Level of Risk Rating	
X - Extreme	Urgent attention
H - High	Intervention required
M - Medium	Active management
L - Low	Ongoing monitoring
N - Negligible	Acceptable risk

EXERCISE: Risk analysis on the risk of spread of pig Disease-X from infected Country B to disease-X free country A.

1. Risk identification

2a. Likelihood rating

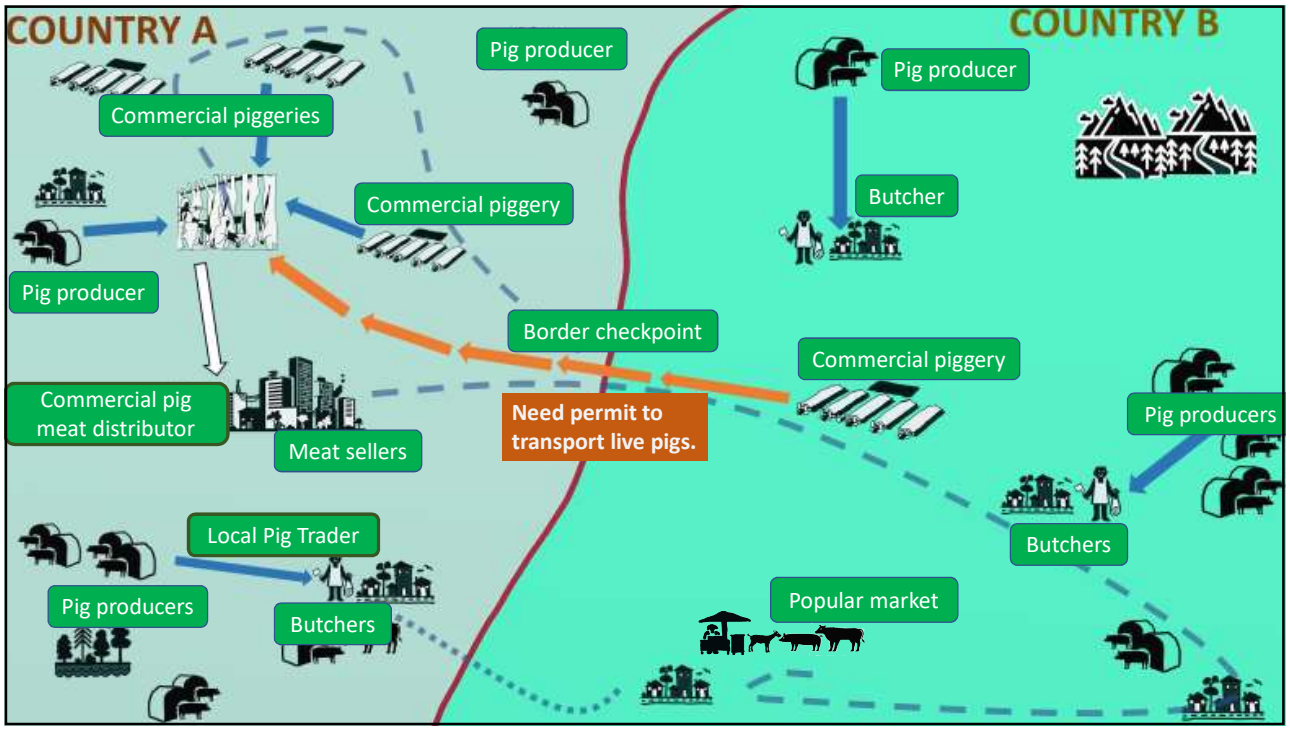
2b. Consequence rating

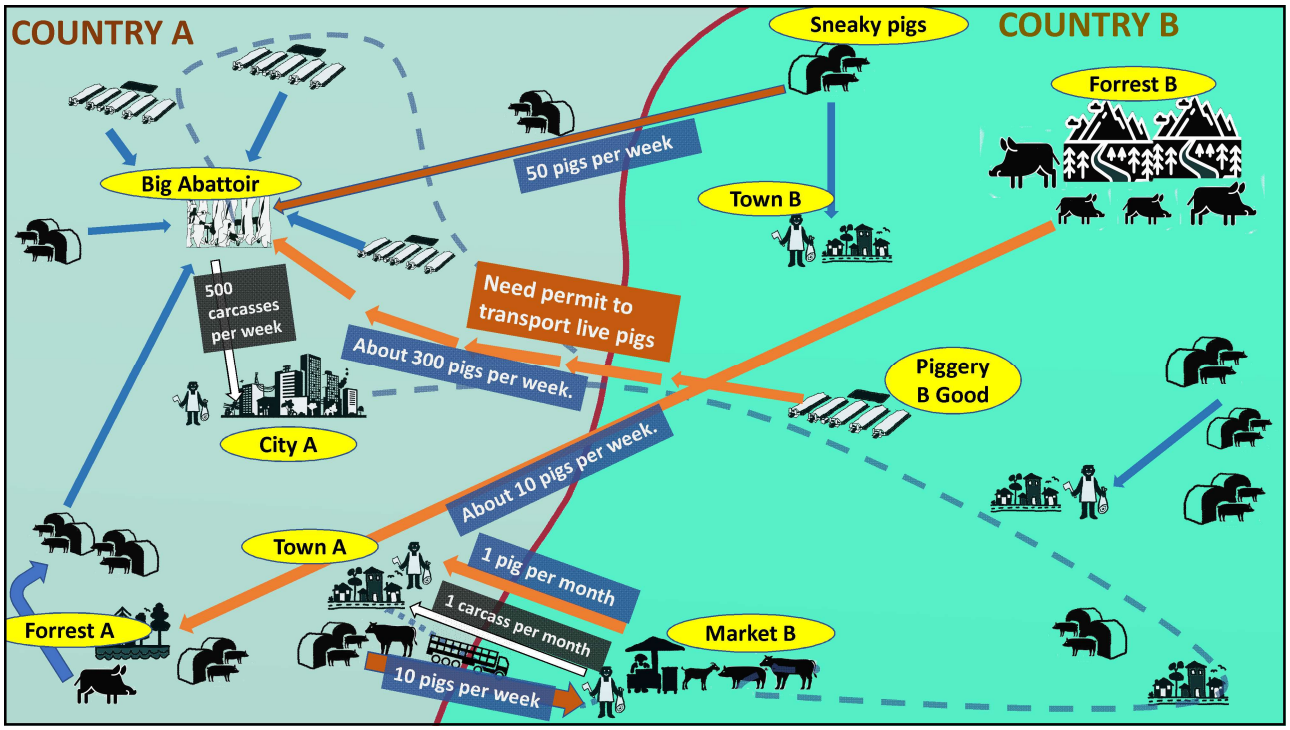
2c. Risk rating

2d. Response indicated

Clinical notes:

- Disease-X is very easily spread by close contact with live infected pigs
- It only affects pigs and has a mortality rate of 50%
- Swill feeding of uncooked pig meat and products can cause disease spread
- Live pigs can occasionally be infected through close contact with surfaces with very fresh infected faeces
- There is an effective but expensive vaccine for Disease-X
- Cases of Disease-X have been found over wide areas of Country B, while Country A is disease free.


COUNTRY A
COUNTRY B
Pig producer
Commercial piggeries
Pig producer
Butcher
Commercial piggery
Pig producer
Border checkpoint
Commercial piggery
Commercial pig meat distributor
Need permit to transport live pigs.
Meat sellers
Pig producers
Local Pig Trader
Butchers
Pig producers
Butchers
Popular market


COUNTRY A
Sneaky pigs
COUNTRY B
Forrest B
Big Abattoir
50 pigs per week
Town B
500 carcasses per week
Need permit to transport live pigs
About 300 pigs per week.
Piggery B Good
City A
About 10 pigs per week.
Town A
1 pig per month
1 carcass per month
Forrest A
Market B
10 pigs per week

EXERCISE 1. Pig Disease-X risk identification

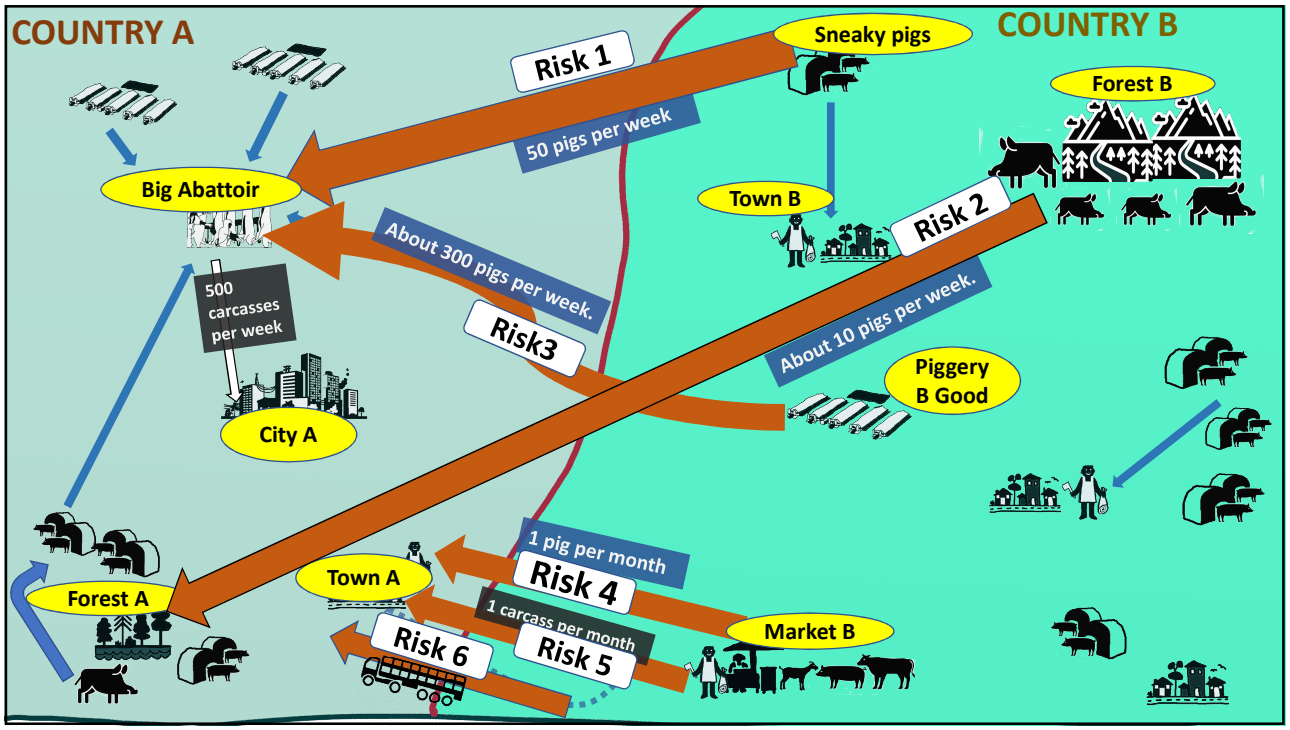
Clinical notes:

- Disease-X is very easily spread by close contact with live infected pigs
- It only affects pigs and has a mortality rate of 50%
- Swill feeding of uncooked pig meat and products can cause disease spread
- Live pigs can occasionally be infected through close contact with surfaces with very fresh infected faeces
- There is an effective but expensive vaccine for Disease-X
- Cases of Disease-X have been found over wide areas of Country B, while Country A is disease free.

1. **On your own write a list of specific risk pathways for spread of Disease-X from Country B into Country A.**
2. **Describe each of these risk pathways as a risk, such as: "The risk of spread of Disease-X via '……..' "**

For example: 'via the movement of carcasses and pig products from Market B to Town A'.

10 minutes



EXERCISE 2. Pig Disease-X risk pathway likelihoods

1. **Make a quick assessment to rate the likelihood for each of the 6 risk pathways to introduce Disease-X into Country A from Country B.**
   1) ….
   2) ……..
   3) ……..
   4) ……..
   5) ……..
   6) ……..

EXERCISE 3. Pig Disease-X risk pathway consequences/ impact

1. **Make a quick assessment to rate the consequence of Disease-X coming into Country A via each of the 6 risk pathways:**

   1) …….
   2) ……..
   3) ……..
   4) ……..
   5) ……..
   6) ……..

EXERCISE 4. Risk ratings for each Disease-X introduction pathway.

1. **Complete a risk rating for each of the risks, using the likelihood and consequence you had for each.**

   1) …….
   2) ……..
   3) ……..
   4) ……..
   5) ……..
   6) ……..

	Consequence rating
1	Negligible
2	Minor
3	Moderate
4	Major
5	Catastrophic

	Likelihood rating
A	Almost certain
B	Likely
C	Possible
D	Unlikely
E	Rarely if ever would occur

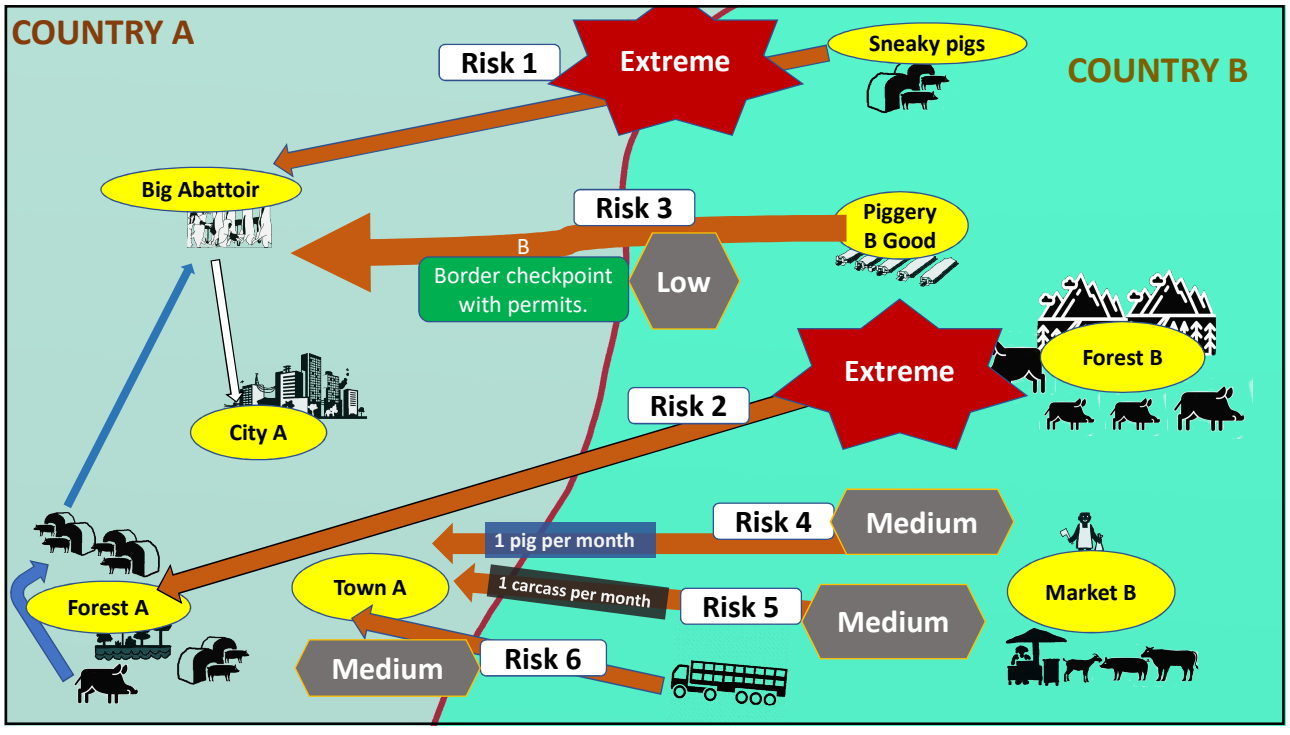
L-Likelihood Rating	C – Consequence Rating 1	2	3	4	5
A	M	M	H	X	X
B	L	M	M	H	X
C	L	L	M	H	H
D	N	L	M	M	H
E	N	N	L	M	H

Level of Risk Rating
X - Extreme
H - High
M - Medium
L - Low
N - Negligible

Results from Poll: risk ratings for each Disease-X introduction pathway.

	Risk pathway	Likelihood	Consequence	RISK RATING	Action indicated
Risk 1	Pigs from sneaky pigs to big abattoir	Almost certain	Catastrophic	Extreme	Urgent attention
Risk 2	Wild pigs from Forest B to Forest A	Almost certain	Major	Extreme	Urgent attention
Risk 3	Pigs by permit from Piggery B Good	Possible	Minor	Low	Ongoing monitoring
Risk 4	Pigs from Market B to Town A	Likely	Moderate	Medium	Active management
Risk 5	Carcasses from Market B to Town A	Possible	Moderate	Medium	Active management
Risk 6	Transport trucks from B back to A	Likely	Moderate	Medium	Active management

Note that the highest two risk pathways were detected through interviews and the lowest risk pathway was the only one identified prior to the sociological processes and interviews.



STEPS IN RISK ANALYSIS SUMMARY

1a. Identify the risk pathways
1b. Name the specific risk for each of the pathways
2a. Assess the likelihood of each of those risks
2b. Assess the consequence of each risk
2c. Calculate a level of risk rating for each risk
2d. Determine the type of response that is required for each risk
3. Prioritise the risks and work through appropriate treatments by priority.
4. Communicate and monitor risks and treatments.

Next module: Step 6 in the Value Chain Analysis for Animal Disease Management and an exercise conducting a value chain risk analysis for FMD entry using sociological tools.