



# **Better Training for Safer Food BTSF**

**Disease Preparedness: Rapid  
Qualitative Risk Assessments**

**Dr Helen Roberts, Defra, UK**



# **BETTER TRAINING FOR SAFER FOOD**

## **BTSF**

### ***Disease Contingency Planning***

*What is risk?*

*How do we assess risk?*

*Exotic disease outbreaks*

*Emerging risks*

*Unknown risks*

## *Risk (in epidemiology):*

- **the probability that an event will occur**

## *Risk (in risk analysis):*

- **the probability that an event will occur and the consequences (impact) if it does**
- **Useful to make meaning explicit when say 'risk', or use 'likelihood', 'probability', 'consequences' etc,**
- **Important to distinguish between**
  - 'hazard' – something that is potentially harmful
  - 'risk' – hazard plus unwanted outcome(s)
- **i.e. must have a plausible risk pathway**

# Risk Assessments

## *Qualitative or quantitative*

Essentially the same process:

Define risk question

Describe/quantify risk factors & mitigating factors

Estimate (veterinary) consequences

Estimate likelihood of occurrence ('risk' in epidemiological terms)

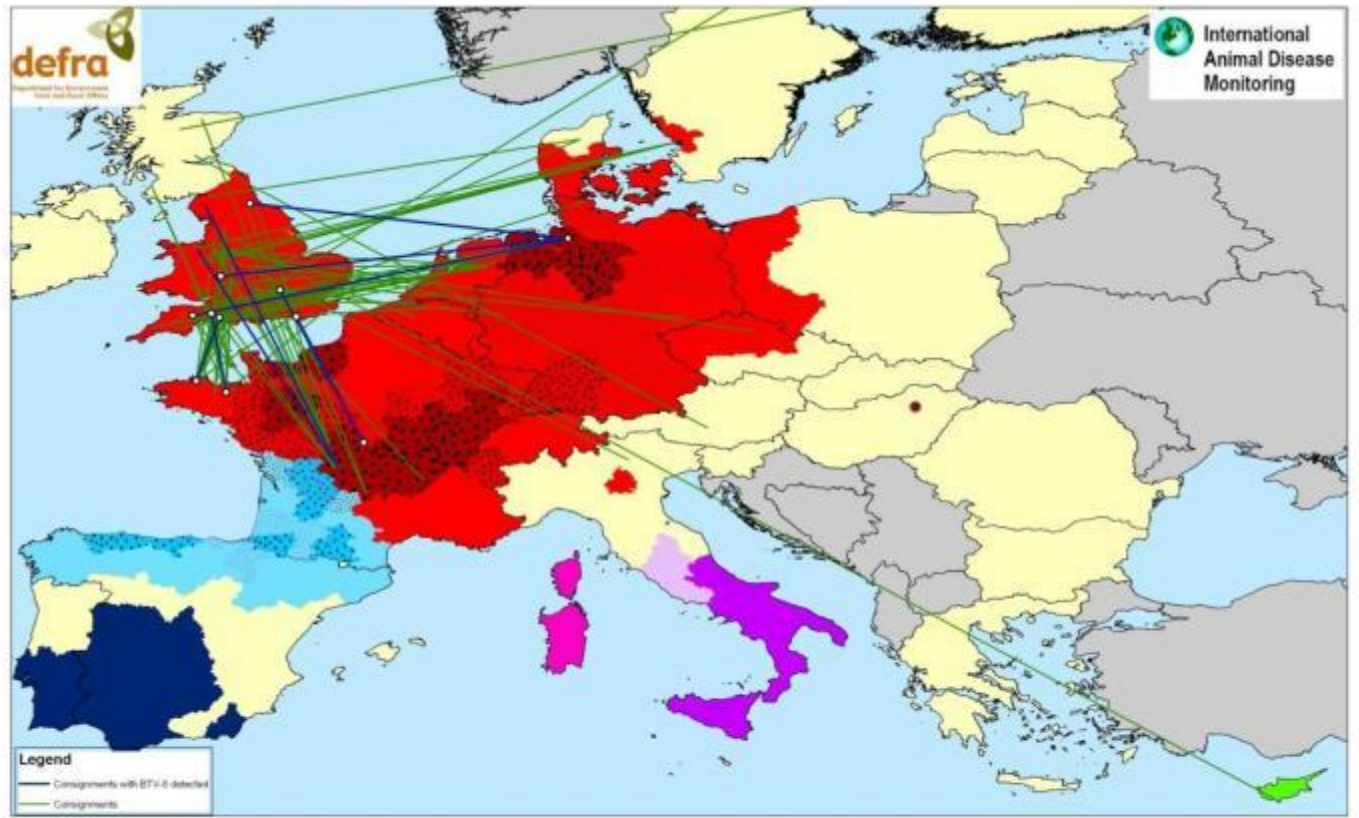
- Qualitative 'very low' or quantitative 'once every 200 years'

Describe the uncertainties and assumptions

Can include discussion of veterinary risk management

Conclusions (and summary of veterinary advice)

# How risk changes: Bluetongue

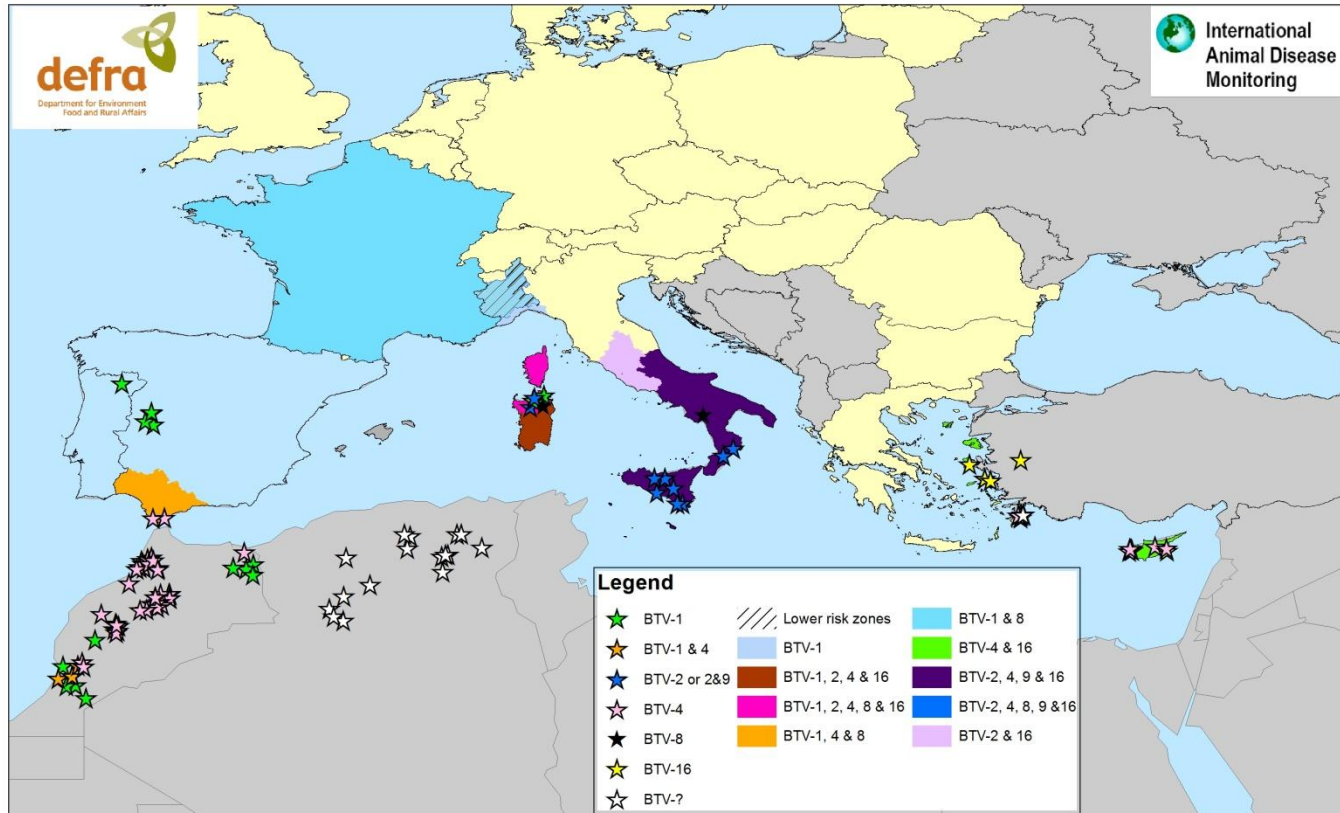


BTV Protection Zones and current BTV-8 and BTV-1 infection levels  
in Northern Europe for June to September 2008



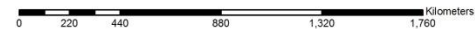
European Commission

# Bluetongue at present



BTV Restriction Zones, current BTV outbreaks in Europe and neighbouring countries for 2011 (as of 12th June 2012)

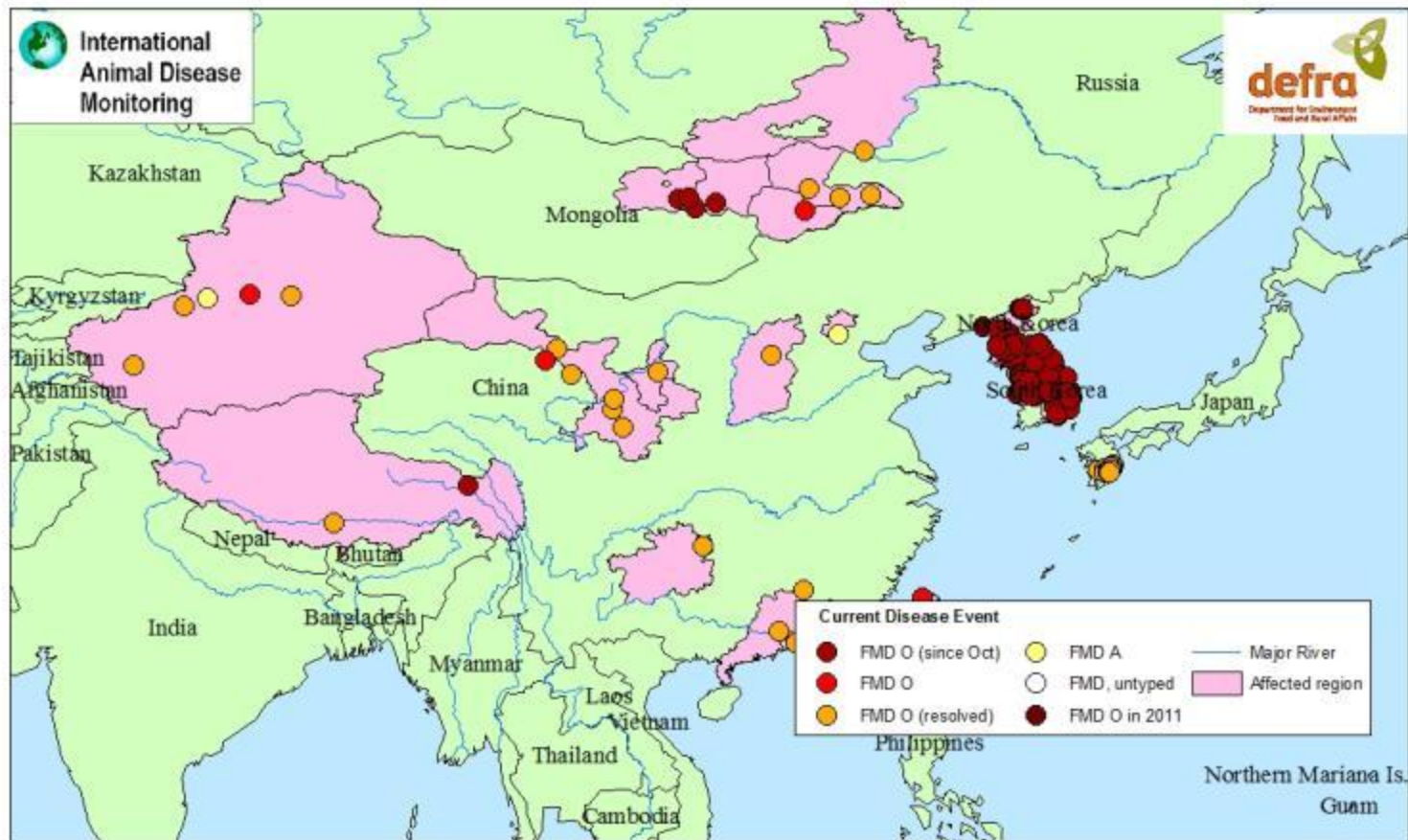
Absolute Scale 1:20,000,000





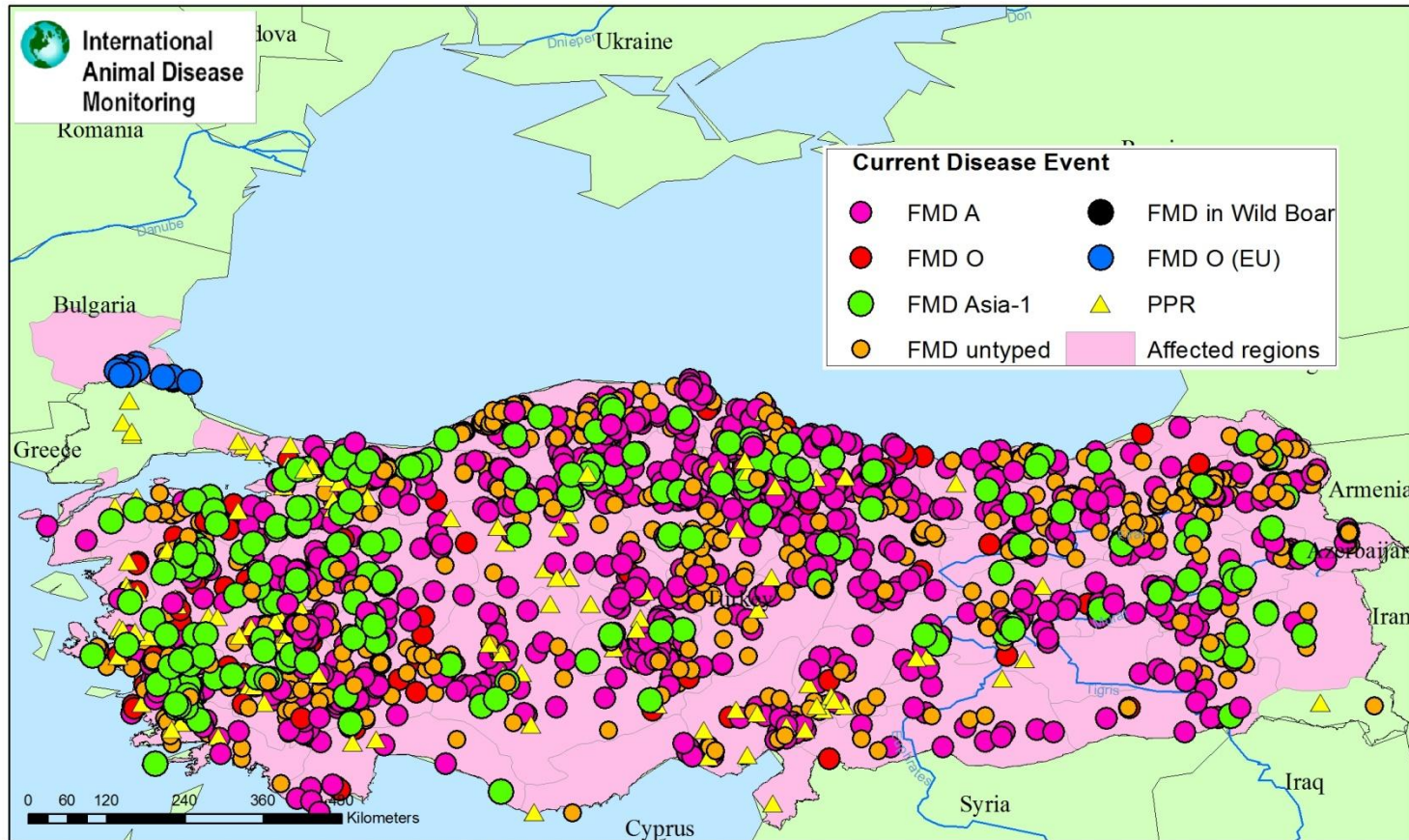
European  
Commission

# Perception of risk: Foot and mouth disease



Recent Foot and Mouth Disease outbreaks in North and South Korea in 2010-11

# FMD in Turkey

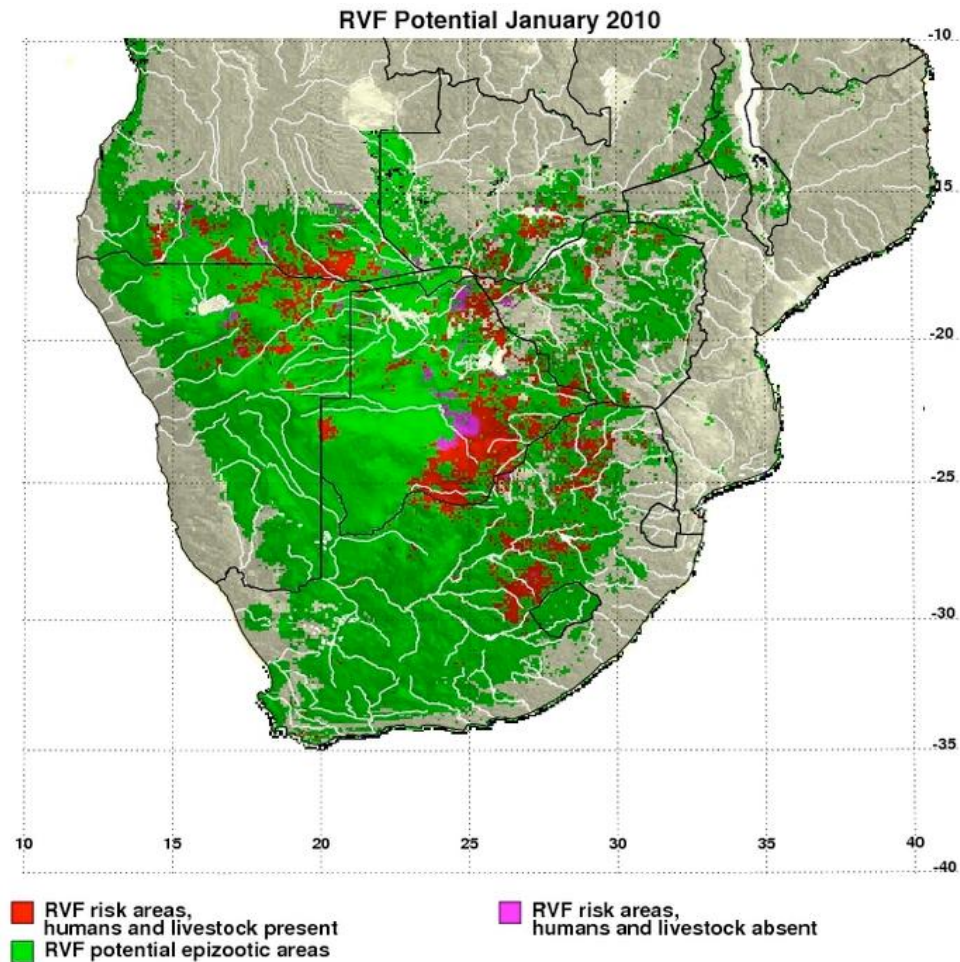


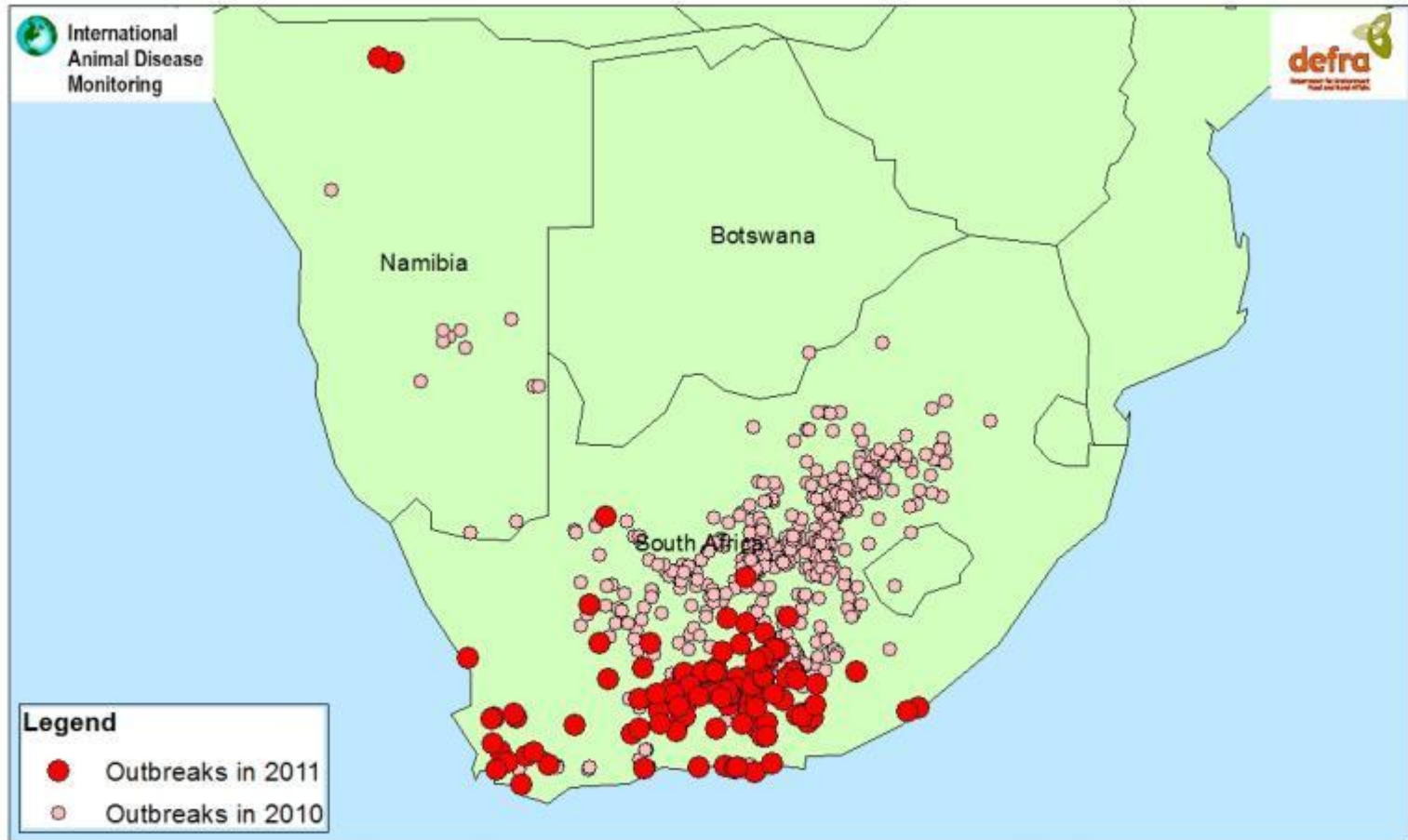
Recent Foot and Mouth Disease outbreaks:  
 Turkey during 2011-2 by serotype  
 and PPR outbreaks to indicate trade in infected ruminants

Map prepared by IDM



# Other means of identifying risk: NASA data on rainfall patterns



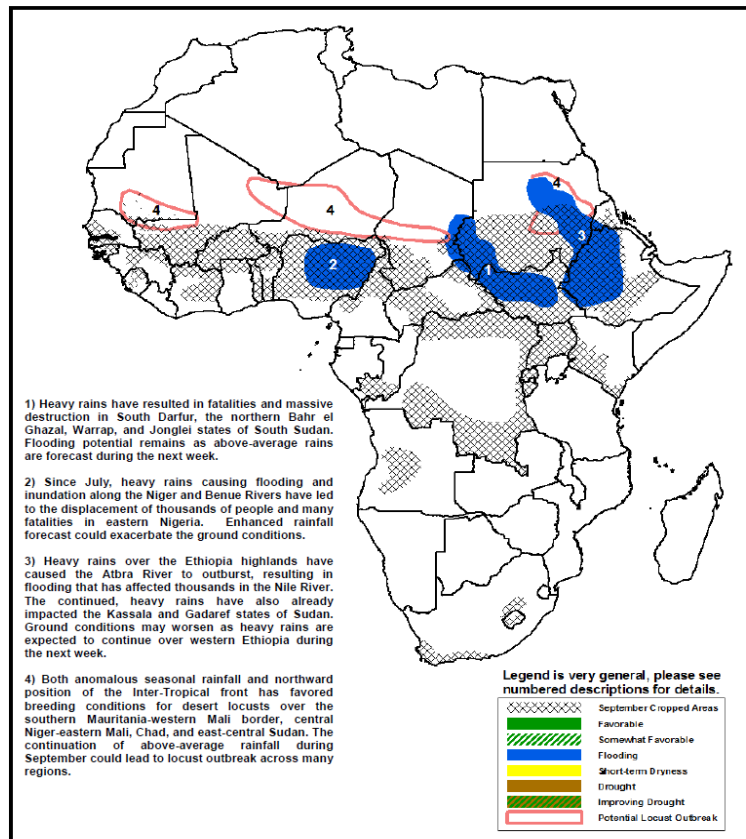


## Rift Valley Fever outbreaks in 2010 and new outbreaks for 2011 in cattle, sheep, goats, camelids and wild animals

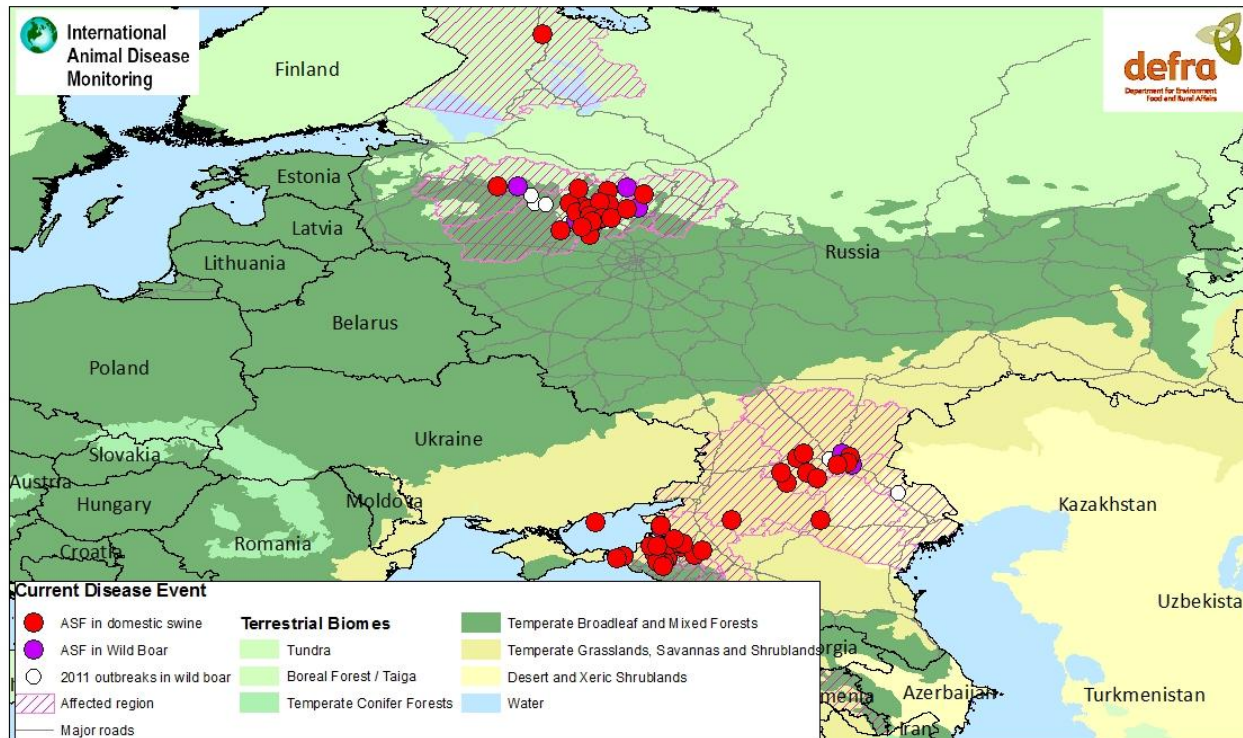


### Climate Prediction Center's Africa Hazards Outlook For USAID / FEWS-NET September 13 – September 19, 2012

- The persistence of above-average moisture conditions has sustained the potential for flooding, river inundation, locusts, and water-borne disease outbreaks across many regions of western and eastern Africa.



# Can legislation help: African Swine Fever in the Caucasus



Date prepared 31/09/2012

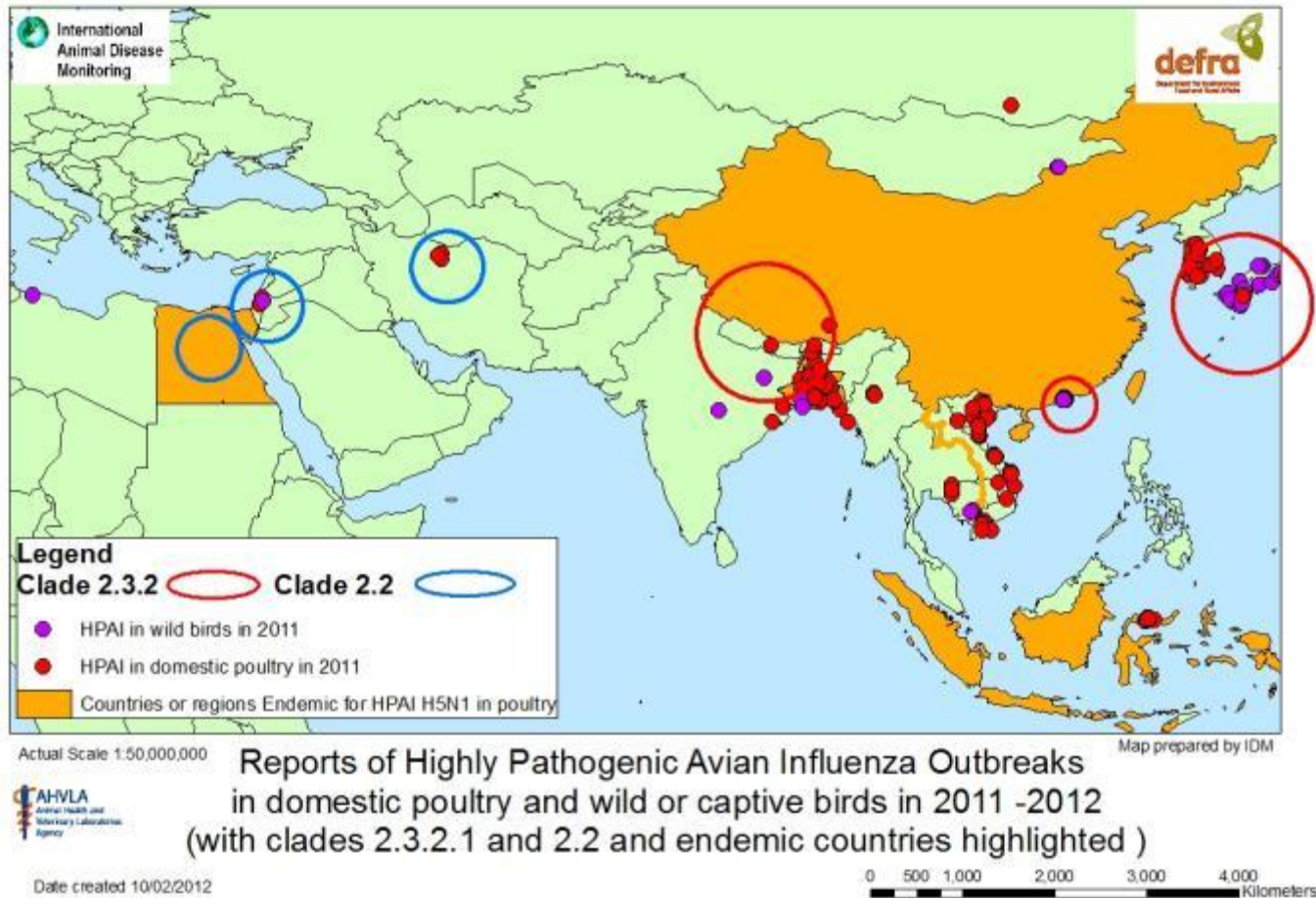
Map prepared by IDM

Actual Scale 1:17,500,000

African Swine Fever in Northern Russia and in Southern regions in domestic pigs (2012) and wild boar, (2011-12) with terrestrial biomes to indicate the Eurasian Steppe/ Forest

0 125 250 500 750 1,000 Kilometers

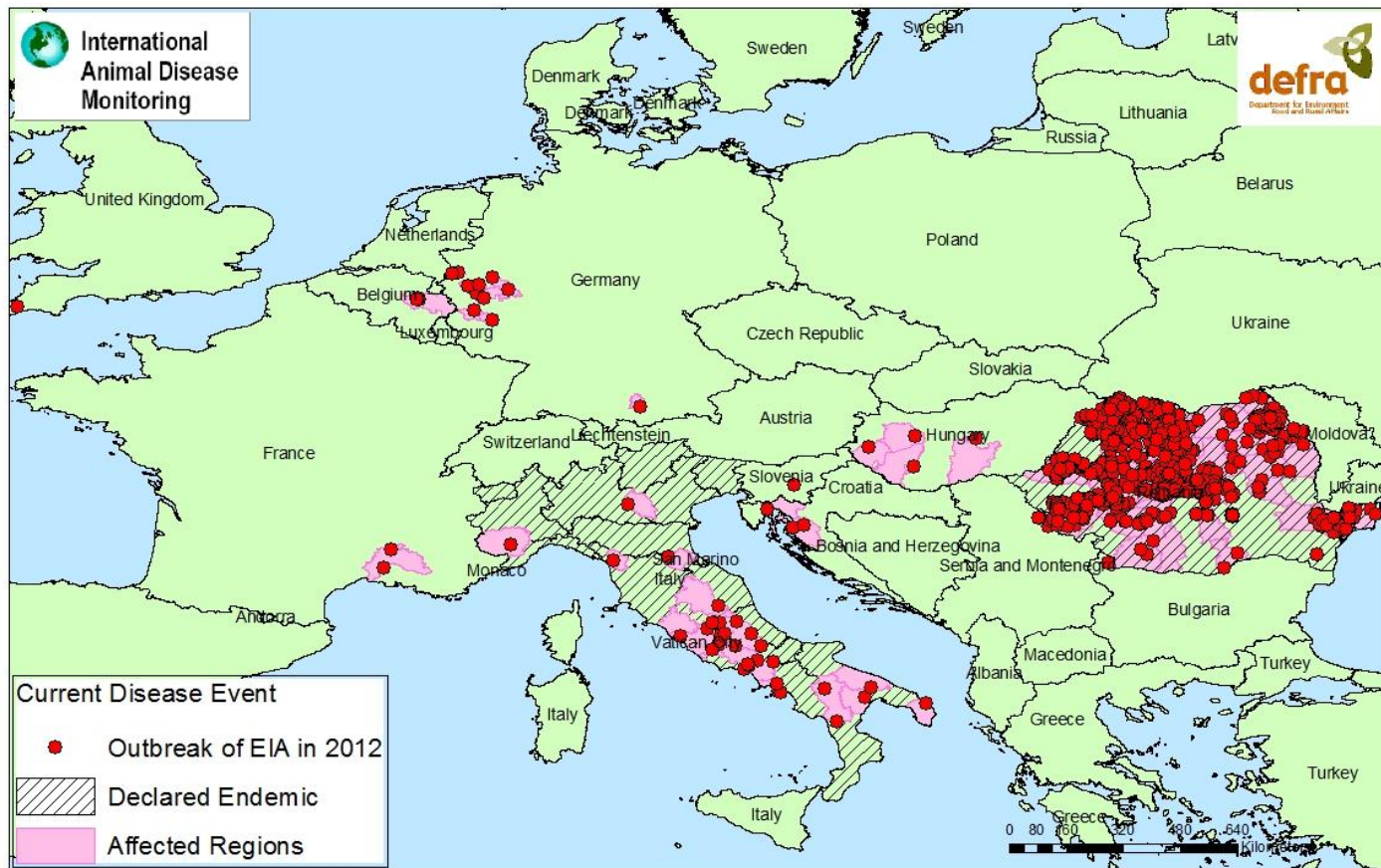
# Complacency: HP Avian Influenza – H5N1





European  
Commission

# Too risk averse: Equine Infectious Anaemia

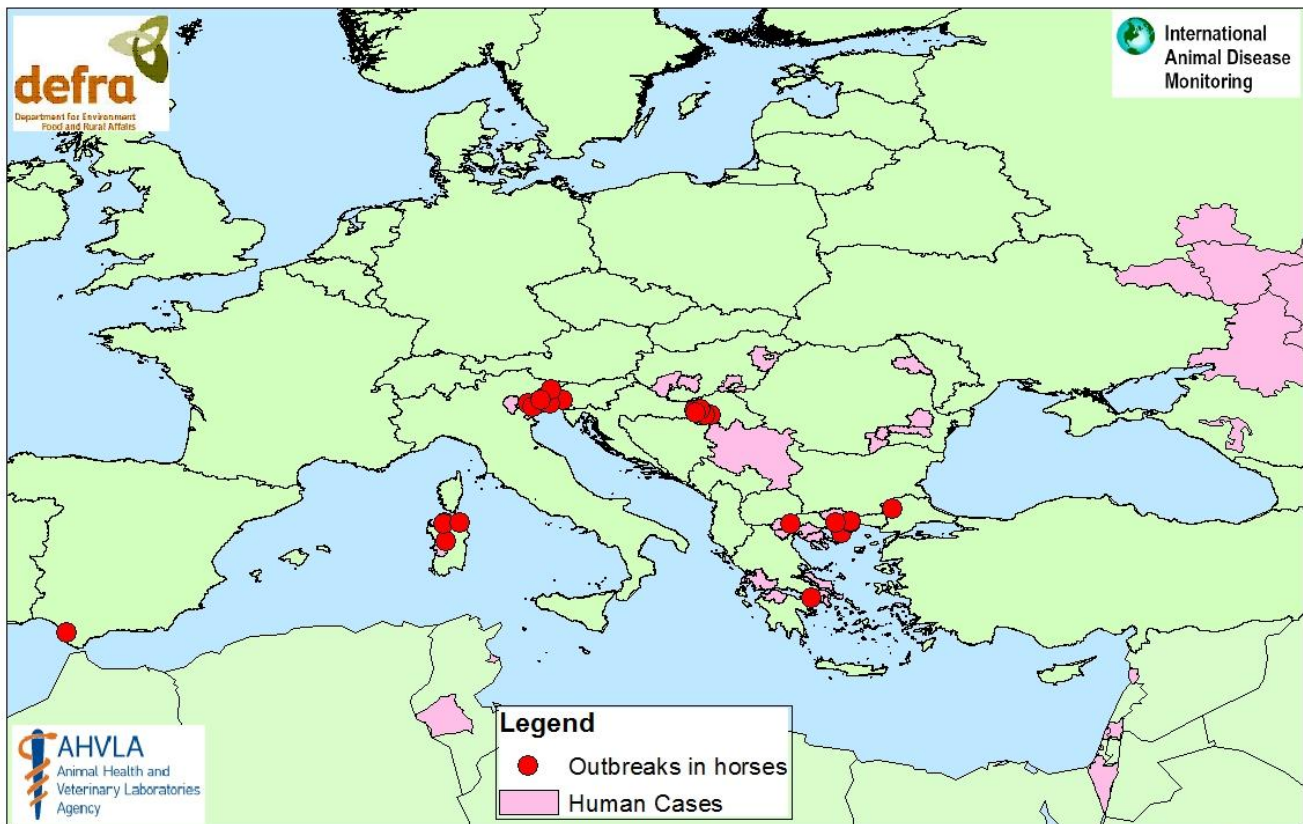


Actual Scale 1:13,000,000  
Date prepared 08/10/2012  
Map prepared by IDM

## Equine Infectious Anaemia outbreaks in Europe in 2012 and endemic regions



# Public Health not AH: West Nile Fever in Europe



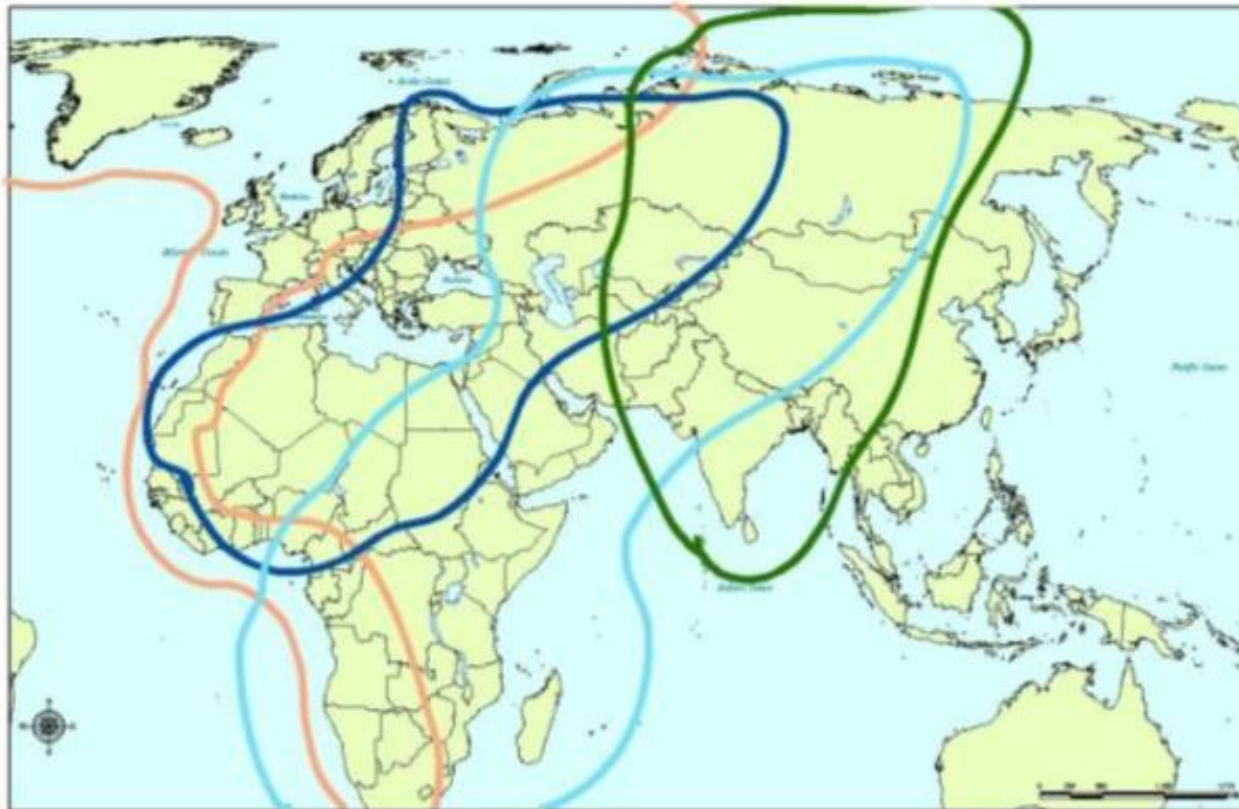
West Nile Virus Outbreaks in horses and humans:  
Central Europe and the Mediterranean, June - Sept 2012

Date prepared 31/09/2012

Absolute Scale 1:20,000,000



European  
Commission

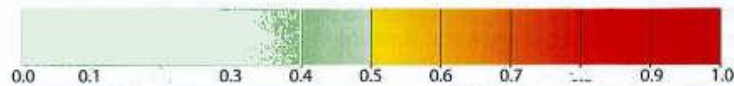
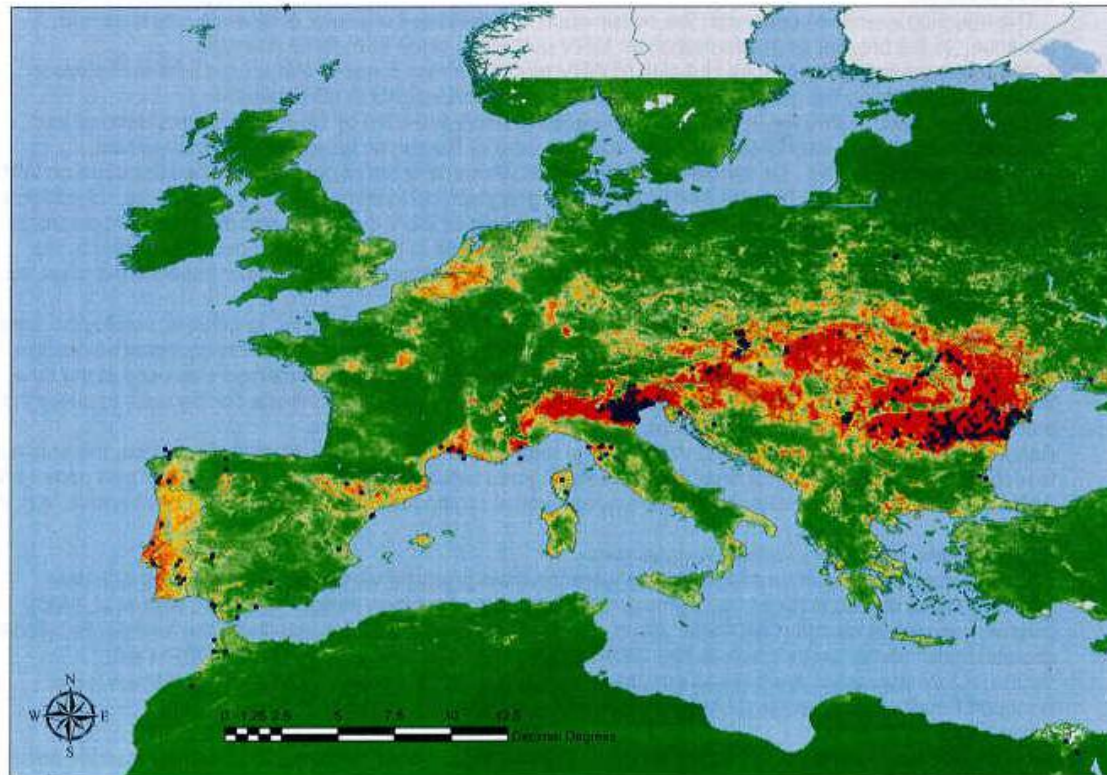


## Migration flyways

AccDIS 8 Development Team  
March 2020  
Source: SSP6 Data & Maps CD  
Created in ArcGIS 10 using ArcMap  
Scale: 1:500  
**Robinson Projection**



# Predictive map of WNV





*Different types of risk*

*Balance between risk averse and  
disproportionate response*

*Do we miss the obvious?*



# Risk Pathways and Countermeasures project

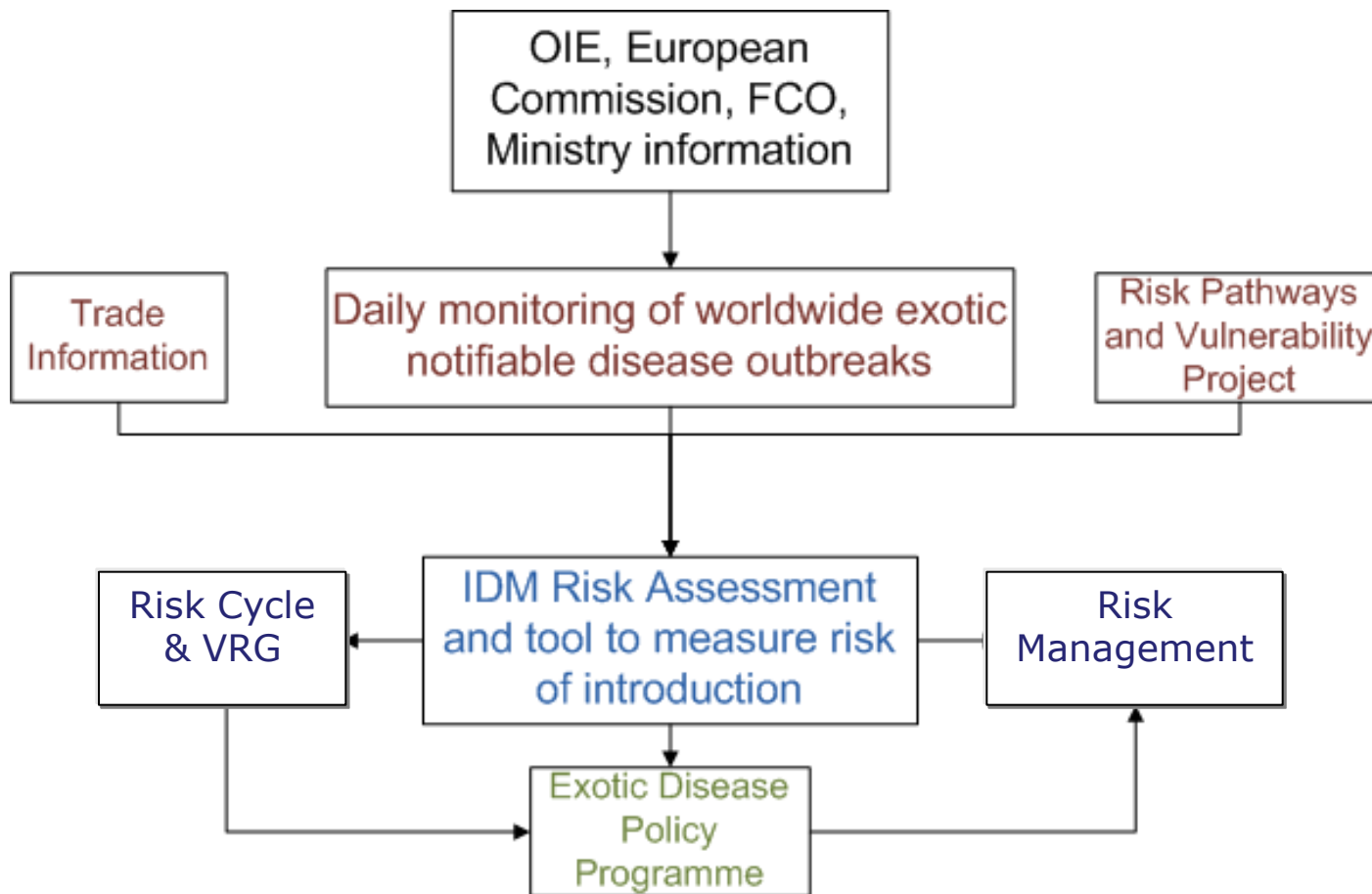
*Threat of exotic animal disease incursion causing an outbreak*

*High level review of routes and risk management*

*Defra must routinely review risk management priorities and measures and identify vulnerabilities*

*Horizon scanning*

# Tool for assessing the risk of disease introduction to the UK



# Tool 1: Products of animal origin

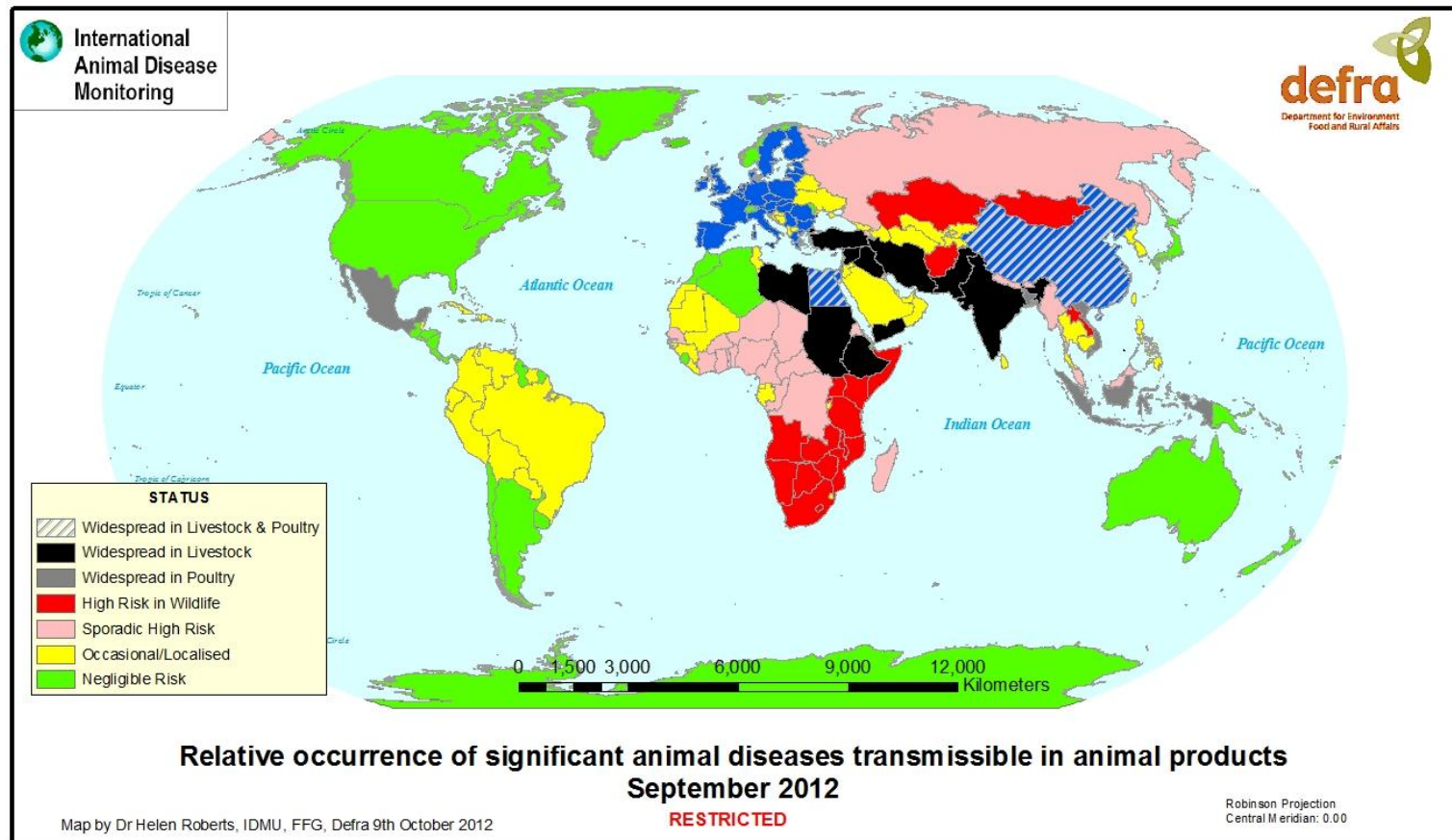
**Helen Roberts:**  
20 = widespread in livestock or poultry 11 = wildlife or 10 for wild birds; 5 = frequent for domestic; 3 = sporadic for domestic

	A	B	C	D	E	F	G	H	S	T	U	V	W	X
											POULTRY	BUSHMEAT	DAIRY	
1	COUNTRY	CODE	STATUS	FMD	CSF	ASF	HPAI	ND	BEEF	PORK				STATUS
2	AFGHANISTAN	AF	Frequent/Widespread	11	0	0	3	3	+	+	+	+		Wildlife
3	ANGOLA	AO	Frequent/Widespread	11	0	5		5	+	+	+	+		Wildlife
4	ARMENIA	AM	Frequent/Widespread	1	3	20		3	+	+	+	+		Sporadic
5	BAHRAIN	BH	Frequent/Widespread	5	0	0		5	+	+	+			Sporadic
6	BANGLADESH	BD	Frequent/Widespread	5	0	0	20	5	+	+	+			Widespread Poultry
63	ALBANIA	AL	Occasional/Localised	0				3	+		+			Negligible Risk
64	AZERBAIJAN	AZ	Occasional/Localised	1	3	5		1	+	+	+	+		Negligible Risk
65	BELIZE	BZ	Occasional/Localised	0				5			+			Negligible Risk
66	BOLIVIA	BO	Occasional/Localised	3	3			3	+	+	+			Negligible Risk
67	BOSNIA AND HERZEGOVINA	BA	Occasional/Localised	0	5					+		+		Negligible Risk
68	BRAZIL	BR	Occasional/Localised	3	3				+	+				Negligible Risk
113	ALGERIA	DZ	Infrequent	1					+	+				Negligible Risk
114	ANDORRA	AD	Infrequent	0										Negligible Risk
115	ANGUILLA	AI	Infrequent	0										Negligible Risk
116	ANTARCTICA	AQ	Infrequent	0										Negligible Risk
117	ANTIGUA AND BARBUDA	AG	Infrequent	0										Negligible Risk
118	ARGENTINA	AR	Infrequent	3					+	+				Negligible Risk
119	ARUBA	AW	Infrequent	0										Negligible Risk
120	AUSTRALIA	AU	Infrequent	0										Negligible Risk
121	BAHAMAS	BS	Infrequent	0										Negligible Risk
122	BARBADOS	BB	Infrequent	0										Negligible Risk
123	BELARUS	BY	Infrequent	0										Negligible Risk
124	BERMUDA	BM	Infrequent	0										Negligible Risk
125	BOLIVIA	BO	Infrequent	0										Negligible Risk

ISO country list

Count: 113

# Where is disease a risk for POAO?



Tool 2: risk of incursion.

What sort of information do we use?

*Country disease status*

*Country Trade status*

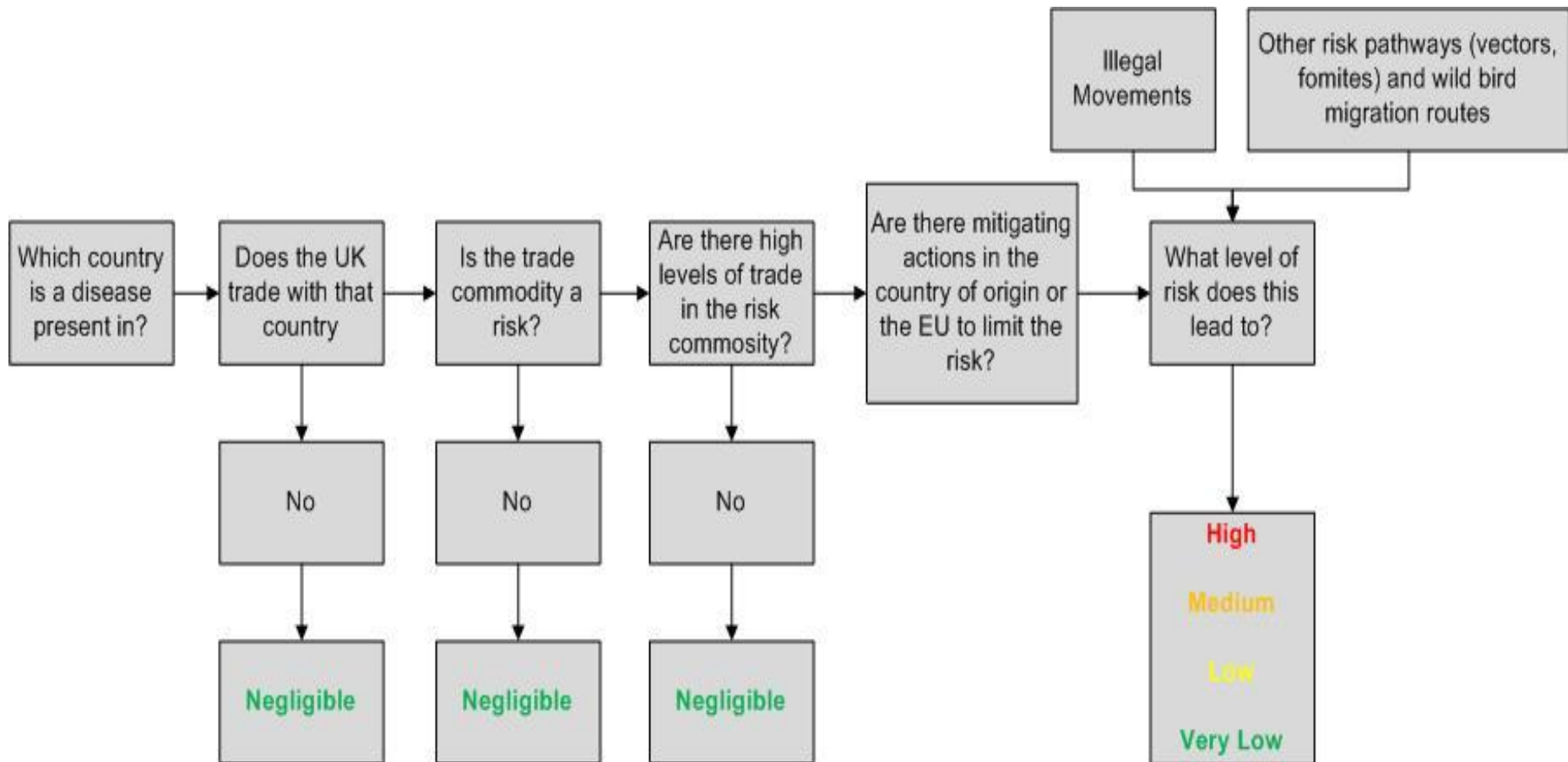
*Volume of Trade, according to York  
Stats unit, TRACES*

*Risk Pathways and Vulnerabilities  
project*

*EU legislation*

*National rules for disease control are  
not included*

# Tool Schematic





# Where is disease?



Disease Distribution	African horse sickness	African swine fever	Avian influenza	Bluetongue	Classical Swine Fever	Equine Viral Encephalomyelitis	Equine Infectious Anaemia
UK	0	0	0	0	0	0	0
Northern EU	0	0	0	0	0	0	0.5
Southern EU	0	0	0	0.5	0	0	0.5
Eastern EU	0	0	0	0	0.5	0	1
Southern Europe	0	0	0	1	1	0	1
Eastern Europe	0	0.5	1	0	1	0	1
Trading Partner - North America	0	0	0	1	0	1	0.5
Trading Partner - South America	0	0	0	0	1	0	1
Trading Partner - Africa	1	1	1	1	1	1	1
Trading Partner - Middle East	0	0	1	1	1	0	1
Trading Partner - Australasia	0	0	0	1	0	0	1
Trading Partner - Asia	0	0	1	1	1	1	1
Global - Africa	1	1	1	1	1	1	1
Global - Asia	0	0	1	1	1	1	1
Global - America	0	0	0	1	1	1	1
Global - Middle East	0	0	0	1	1	1	1

# How is it transmitted?



	African horse sickness	African swine fever	Avian influenza	Bluetongue	Classical Swine Fever	Equine Viral Encephalomyelitis	Equine Infectious Anaemia	Foot and mouth Disease
Imports of Livestock or Pets (excludes horses)	X	Yes	Yes	Yes	Yes	X	X	Yes
Imports of Meat	X	Yes	Yes	X	Yes	X	X	Yes
Imports of Germplasm	Yes	X	X	Yes	Yes	X	Yes	Yes
Imports of laboratory material	Yes	Yes	Yes	X	Yes	X	Yes	Yes
Livestock transport vehicles / fomites from abroad	X	Yes	Yes	Yes	Yes	X	X	Yes
Importation & Movement of Horses	Yes	X	X	X	X	Yes	Yes	X
Waste from Retail / Food Processing	X	Yes	Yes	X	Yes	X	X	Yes
Migration of Wild Birds	X	X	Yes	X	X	Yes	X	X
Contact between livestock & competent insect vectors in GB	Yes	X	X	Yes	X	Yes	Yes	X
Illegal imports	X	Yes	Yes	Yes	Yes	X	X	Yes



## Importance of Trade

*Livestock trade is 17% of global agricultural exports and rising.*

*Global production and consumption of meat is 233 million tonnes in 2000, expected to rise to 300 million tonnes in 2020.*

*For milk, same figures are 568 million tonnes rising to 700 million tonnes.*

*Small ruminant trade between Horn of Africa and Saudi Arabia during Eid is worth between 0.6 and 0.9 billion USD per year.*

# How much trade is there?

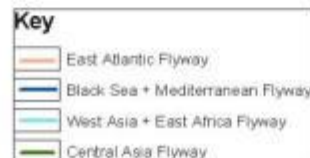
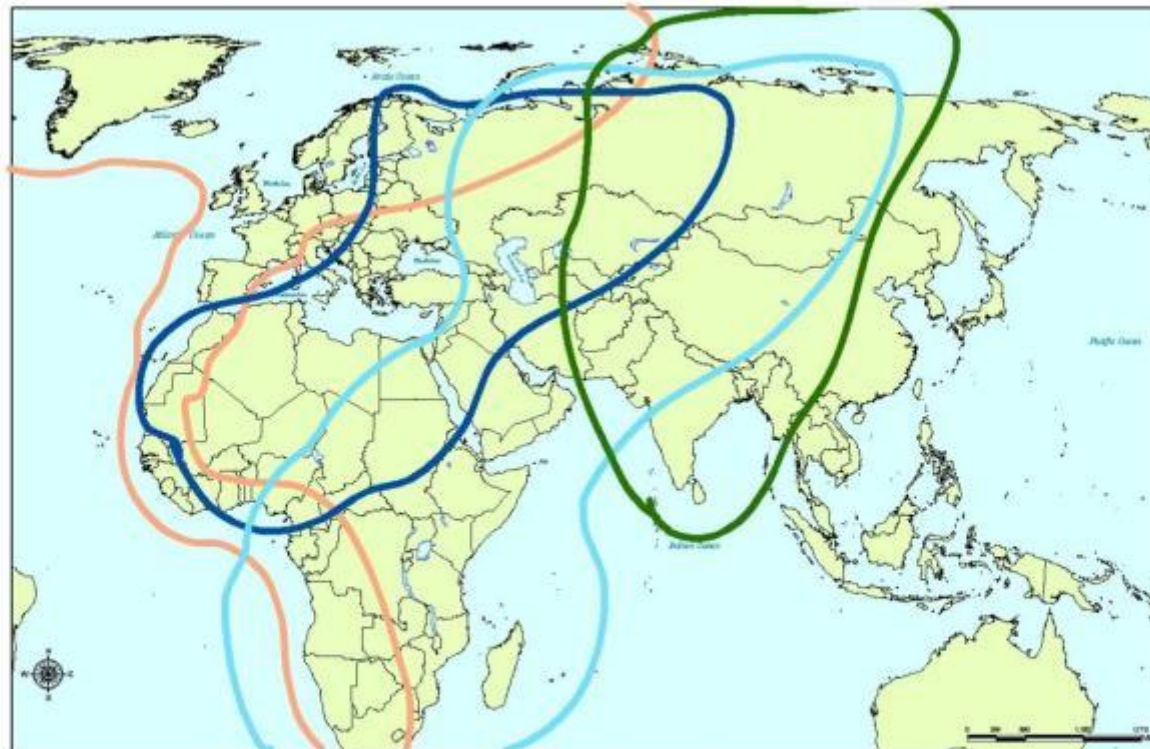


	Bluetongue			Brucellosis			Foot and Mouth			Vesicular Stomatitis		
	Live Animals	Germplasm	POAO	Live Animals	Germplasm	POAO	Live Animals	Germplasm	POAO	Live Animals	Germplasm	POAO
Volumes of trade where 0=none, 1=low or sporadic, 2=regular but small quantities and 3=high volumes of trade												
UK	3	3	3	3	3	3	3	3	3	3	3	3
Northern EU	2	3	3	2	3	3	2	3	3	2	3	3
Southern EU	1	1	3	1	1	3	1	1	3	1	1	3
Eastern EU	1	1	3	1	1	3	1	1	3	1	1	3
Southern Europe	0	0	0	0	0	0	0	0	0	0	0	0
Eastern Europe	0	0	0	0	0	0	0	0	0	0	0	0
Trading Partner - North America	0	3	3	0	3	3	0	3	3	0	3	3
Trading Partner - South America	0	1	3	0	1	3	0	1	3	0	1	3
Trading Partner - Africa	0	1	3	0	1	3	0	1	3	0	1	3
Trading Partner - Middle East	0	0	0	0	0	0	0	0	0	0	0	0
Trading Partner - Australasia	1	2	3	1	2	3	1	2	3	1	2	3
Trading Partner - Asia	0	0	1	0	0	1	0	0	1	0	0	1
Global - Africa	0	0	0	0	0	0	0	0	0	0	0	0
Global - Asia	0	0	0	0	0	0	0	0	0	0	0	0
Global - America	0	0	0	0	0	0	0	0	0	0	0	0
Global - Middle East	0	0	0	0	0	0	0	0	0	0	0	0

## Mitigation – a negative score

	African horse sickness	African swine fever	Avian influenza	Bluetongue	Classical Swine Fever	Equine Viral Encephalomyelitis	Equine Infectious Anaemia	Foot and mouth Disease
Control Plan in place	N	N	Y	Y	Y	N	Y	Y
Vaccine applied in EU	N	N	N	Y	Y	Y	N	Y
Movement restrictions imposed	Y	Y	Y	Y	N	Y	Y	Y
Culling/Surveillance in place	Y	N	Y	Y	N	Y	Y	Y
EU trade rules apply	Y	Y	Y	Y	Y	Y	Y	Y
Environmental conditions in the EU	Y	P	Y	Y	Y	Y	Y	Y

# New Tool addition: Wild Bird migration

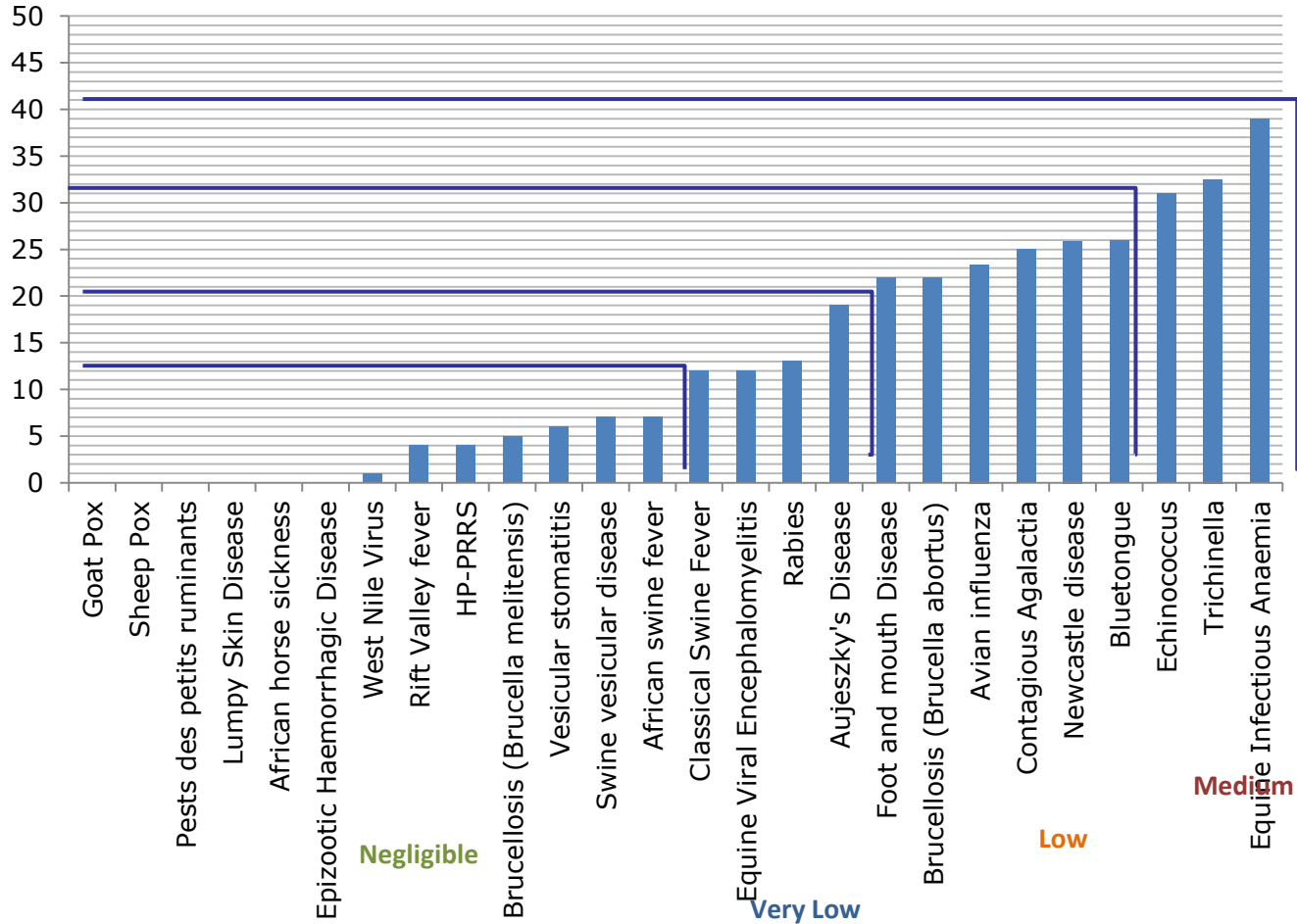


## Migration flyways

ArcticGIS Development Team  
March 2000  
Source: EBRI Data & Maps CD  
Created in ArcticGIS using ArcMap  
Date/Version: 10/01  
Robinson Projection

Disease Distribution	Avian Influenza					Newcastle Disease					West Nile Virus				
	East Atlantic Flyway	Black Sea Mediterranean	Central Asia	West Africa and East Asia	East Asia Australasia	East Atlantic Flyway	Black Sea Mediterranean	Central Asia	West Africa and East Asia	East Asia Australasia	East Atlantic Flyway	Black Sea Mediterranean	Central Asia	West Africa and East Asia	East Asia Australasia
UK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northern EU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Southern EU	0	0	0	0	0	0	0	0	0	0	0.5	0.5	0	0	0
Eastern EU	0	0	0	0	0	0	0	0	0	0	0.5	0.5	0	0	0
Southern Europe	0	0	0	0	0	0	0.5	0	0	0	0	0.5	0	0	0
Eastern Europe	0	0	0	0	0	0	0	0	0	0	0.5	0.5	0.5	0.5	0
Trading Partner - North America	0	0	0	0	0	0.5	0	0	0	0	1	0	0	0	0
Trading Partner - South America	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trading Partner - Africa	1	1	0	1	0	0.5	0.5	0	0.5	0	0	0	0	0	0
Trading Partner - Middle East	1	1	0	1	0	0.5	0.5	0	0.5	0	0	0	0	0	0
Trading Partner - Australasia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trading Partner - Asia	0	0	1	1	1	0	0	1	1	1	0	0	0	0	0
Global - Africa	1	1	0	1	0	1	1	0	1	0	0	0	0	0	0
Global - Asia	0	0	1	1	1	0	0	1	1	1	0	0	0	0	0
Global - America	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Global - Middle East	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0
<b>Total Trade Risk</b>	<b>3</b>	<b>1.5</b>	<b>0.67</b>	<b>1.25</b>	<b>0.4</b>	<b>3.5</b>	<b>1.75</b>	<b>0.67</b>	<b>1.25</b>	<b>0.4</b>	<b>2.5</b>	<b>1</b>	<b>0.17</b>	<b>0.13</b>	<b>0</b>

## Risk score - including bird migration





# Our response

Assessed Risk	Risk Category	Terminology	Regulatory action taken							
			Check Traces	Enforcement			Increased Surveillance	Disease control		
				Inform UKBA	Inform BIP	Post-import		Investigation	Disease control	
Negligible	G	So rare, does not merit consideration	✓							
Very low	G/A	Very rare, but cannot be excluded	✓	[✓]	[✓]					
Low	A	Rare, but does occur	✓	✓	[✓]	[✓]	[✓]			
Medium	A/R	Occurs regularly	✓	✓	[✓]	[✓]	[✓]	[✓]		
High	R	Occurs very often	✓	✓	✓	[✓]	[✓]	[✓]	[✓]	[✓]
Very high	R	Events occur almost certainly	✓	✓	✓	✓	[✓]	[✓]	[✓]	[✓]

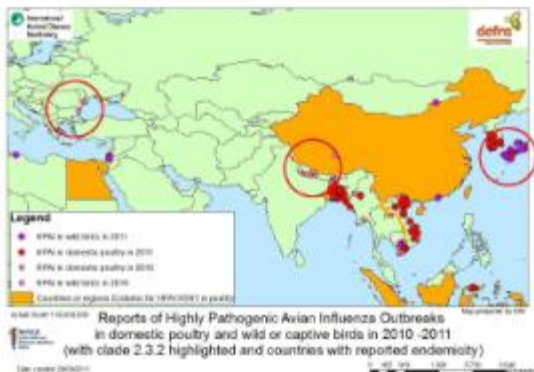
## Highly Pathogenic Avian Influenza H5N1 in South East Asia

### Update Situation Assessment

Note: Defra's International Disease Monitoring (IDM) team monitors outbreaks of high impact diseases around the world. Highly Pathogenic Avian Influenza (HPAI) is among those diseases of major concern.

#### 1 Disease Report

In March 2011, Defra reported on the increase in outbreaks of HPAI H5N1 across East Asia which was attributed to clade 2.3.2 (Defra, 2011). The Food and Agriculture Organisation (FAO) has now reported that the increase due to a particular strain of this clade, H5N1 2.3.2.1, has spread in poultry and wild birds into South East Asia, including North Vietnam and posing a risk to other South East Asian countries (FAO, 2011). The FAO strongly advises increased preparedness and surveillance in this region.



Defra, UK - Disease surveillance and control - International disease monitoring - Windows Internet Explorer

http://defraweb/foodfarm/farmanimal/diseases/monitoring/index.htm

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▼ Animal diseases

▼ International disease monitoring

- ▶ Preliminary outbreak assessments
- ▶ Qualitative risk assessments
- ▶ Veterinary Record Reports

**International disease monitoring**

The International Disease Surveillance team is part of International Animal Health Division. We monitor occurrence of major animal disease outbreaks worldwide as an early warning to assess the risk these events may pose to the UK.

Our assessments and reports aim to raise awareness that animal disease outbreaks occur regularly around the world. We publish:

- Preliminary outbreak assessments
- Qualitative risk assessments
- Veterinary Record

Anyone who has any comment on these is welcome to contact us via e-mail: [iadm@defra.gsi.gov.uk](mailto:iadm@defra.gsi.gov.uk)

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# Example of risk assessment and management

## *Equine Infectious Anaemia*

- **Disease present in Italy and Romania and not controlled by culling**
- **Horse movement is complicated and relies on passports and registration**
- **Certain high value competition horses are considered lower risk**
- **However low value horses may not be**

# Risk Assessment

## *Identify:*

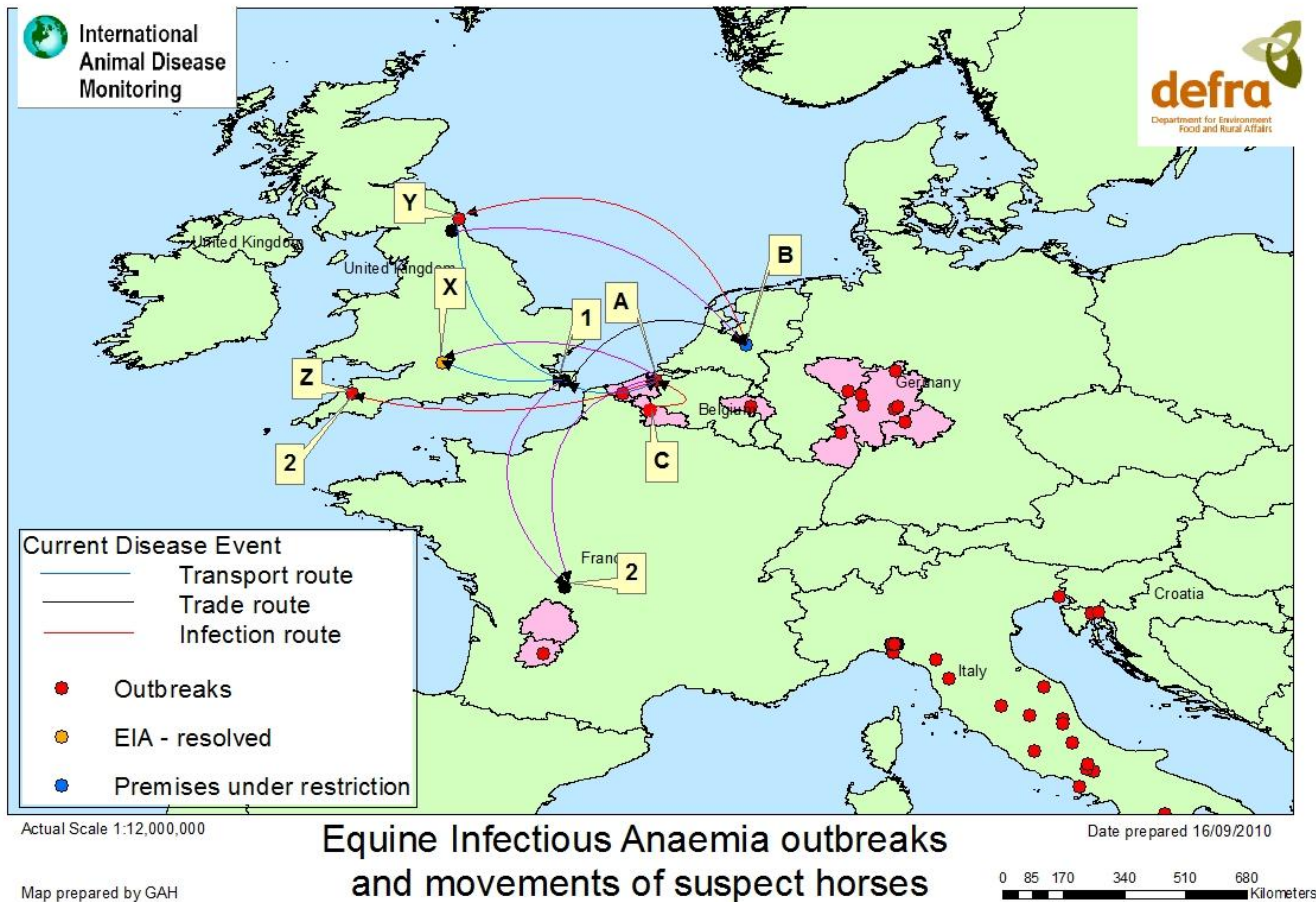
- **Countries at risk**
- **Horse population at risk**
- **Estimate numbers involved**
- **Estimate the risk factors (certain consignors?)**
- **Decide on a management process**

# Legislative context

*Directive 90/425/EEC concerning Vet and Zoo checks applicable in Intra-Community Trade in certain live animals and products ....*

- **Places responsibility on consigning MS**
- **Does not allow extensive or blanket checks as disproportionate and burdensome**
- **Can carry out compliance checks (DIP checks) on a proportion of consignments**

# Tracing movement and EU cooperation





## Conclusions

*Horizon Scanning is an important tool in Defra's risk management repertoire.*

*Risk of disease incursion is only one of several sources of information.*

*This can influence our policy decisions on an ad hoc basis as well as future legislation*

*Thank you for your attention!*