Updates on Trans-boundary Swine Diseases

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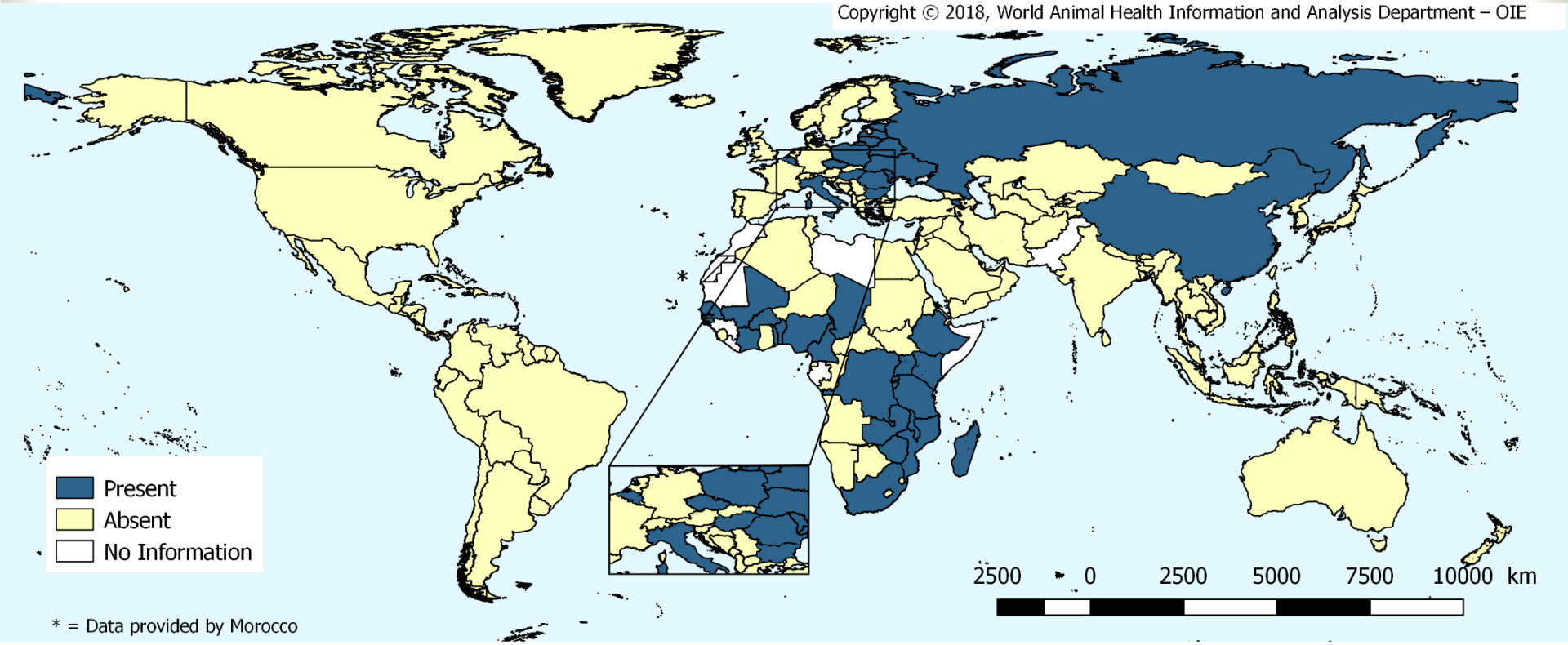
WORLD ORGANISATION FOR ANIMAL HEALTH
Protecting animals, preserving our future

African swine fever (ASF)

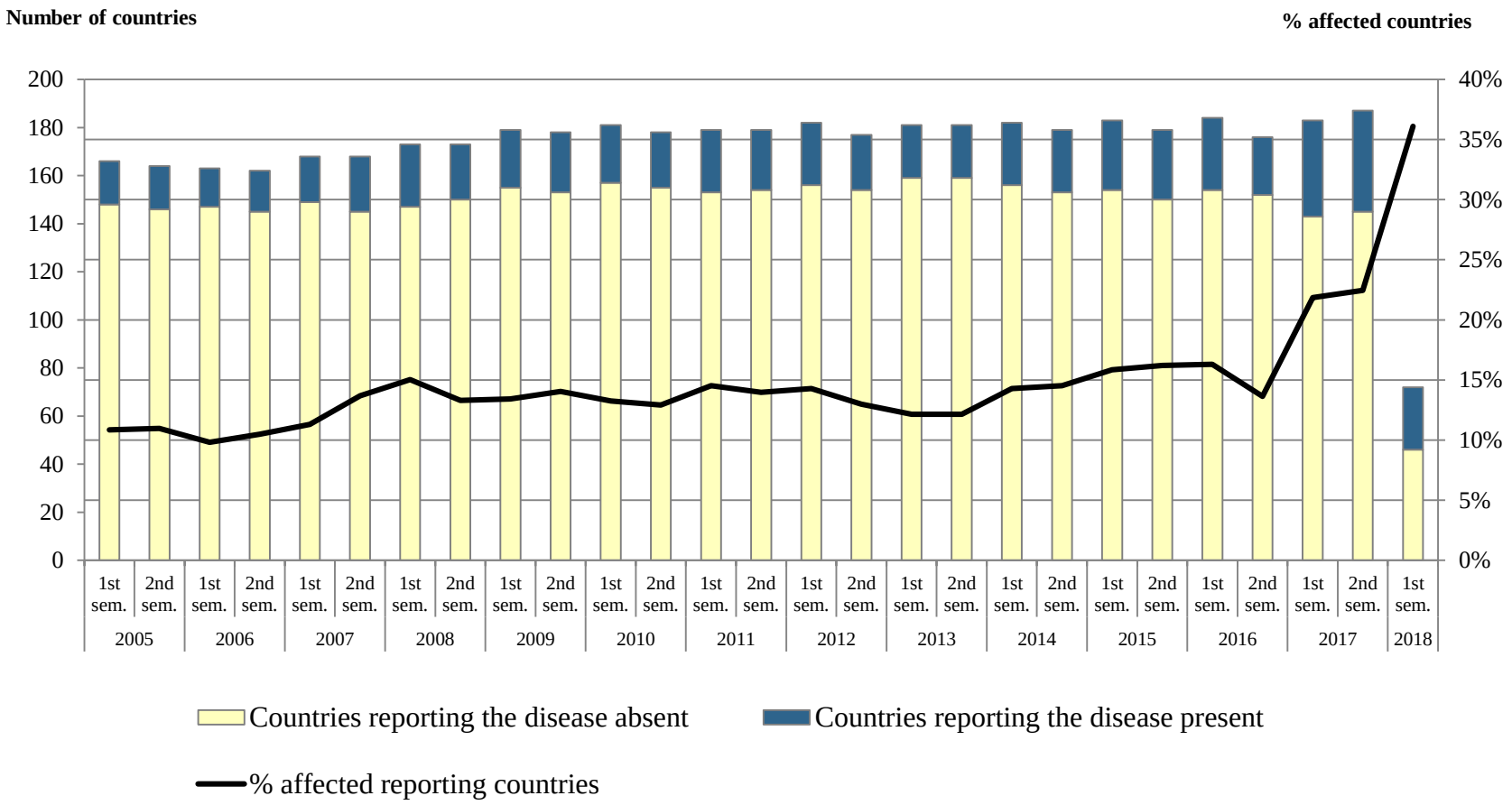
Distribution of ASF worldwide 2005-2018

(updated the 25/09/2018)



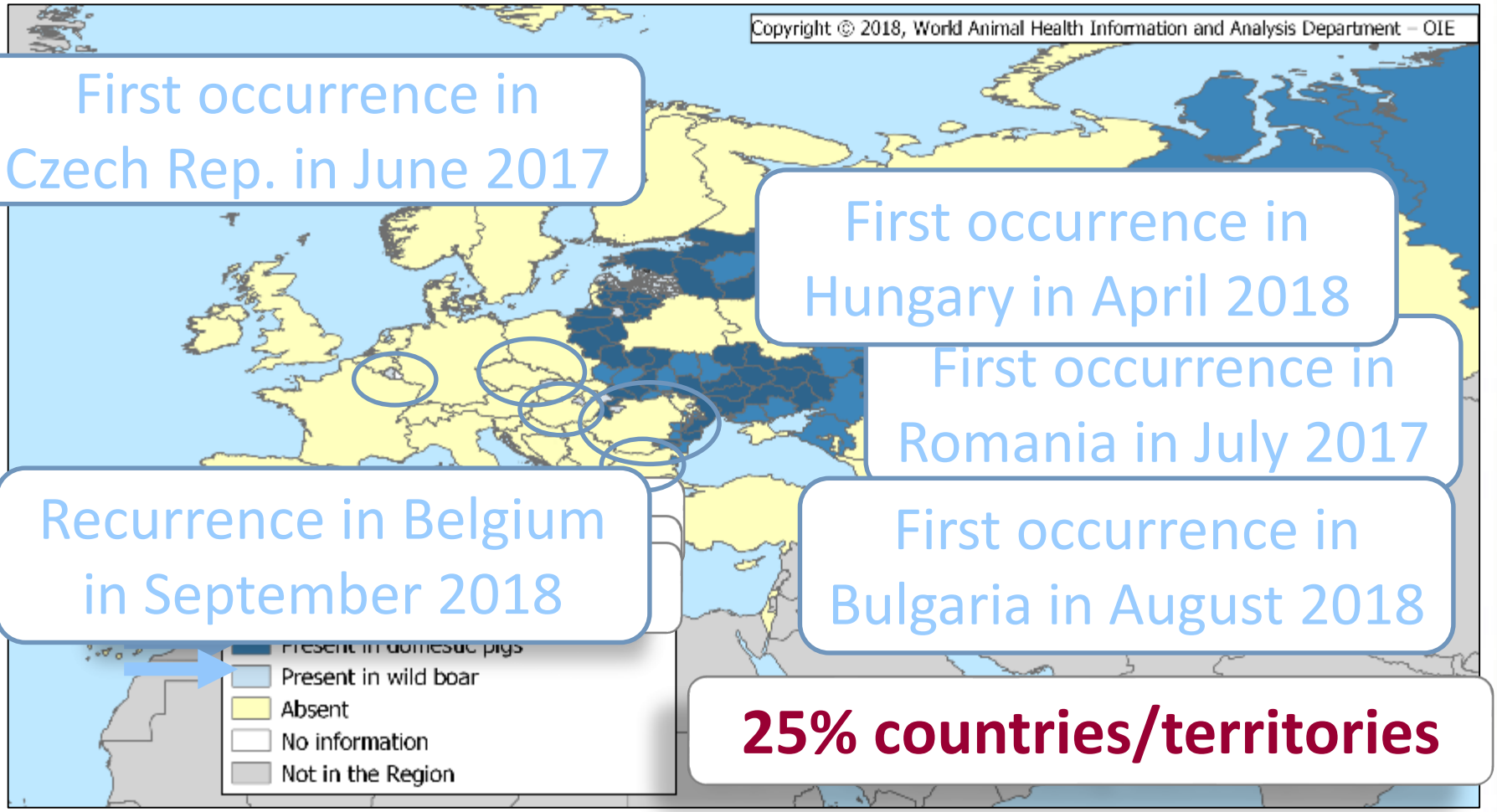
Number of countries reporting ASF present and absent overlapped with the percentage of reporting countries and territories that notified ASF present for each semester between 2005 and 2018

(data based on reports received up to 25 September 2018)



Distribution of ASF in Europe in 2017 and 2018

(up to 11 September 2018)



First occurrence in Czech Rep. in June 2017

First occurrence in Hungary in April 2018

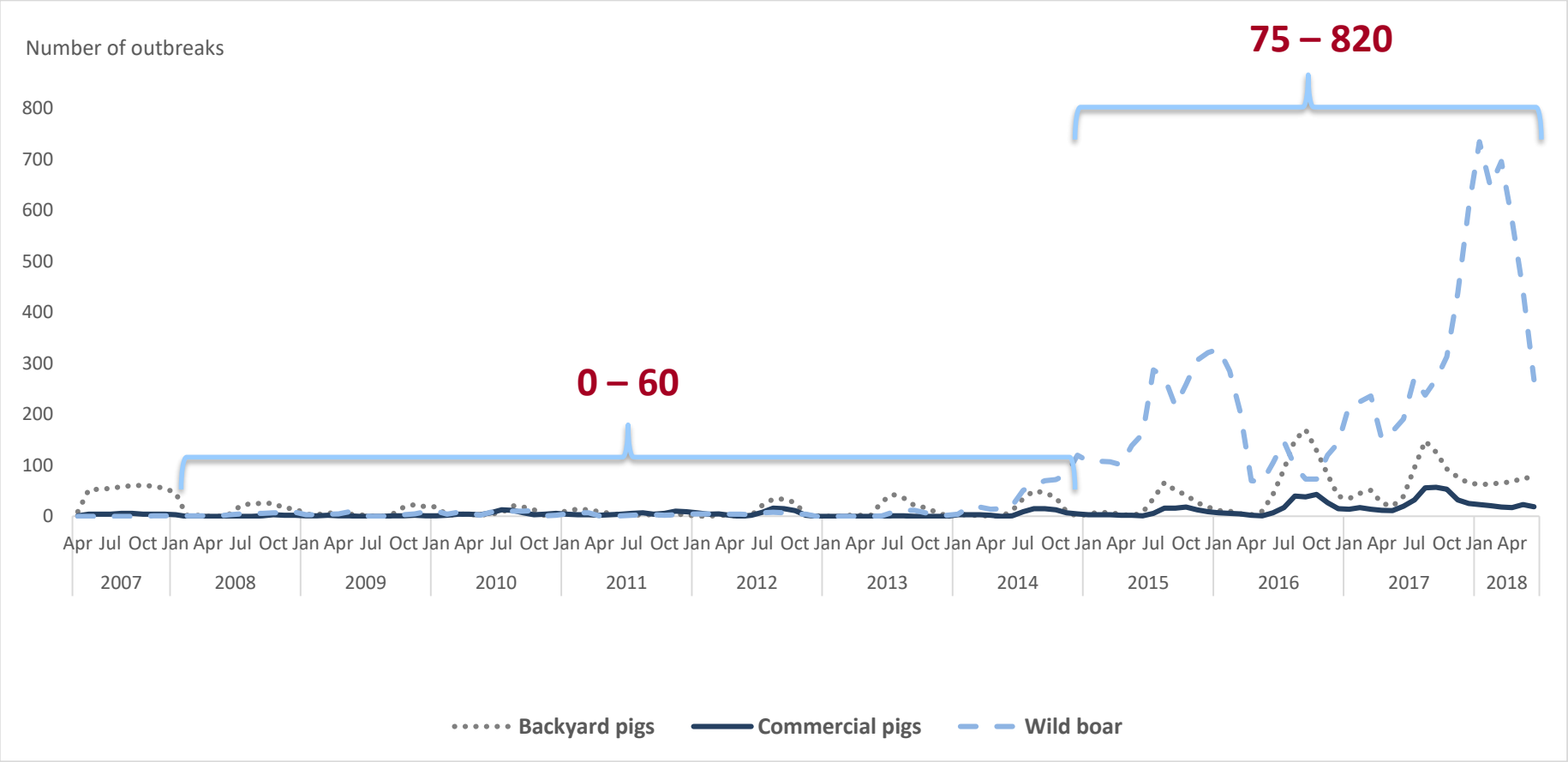
First occurrence in Romania in July 2017

Recurrence in Belgium in September 2018

First occurrence in Bulgaria in August 2018

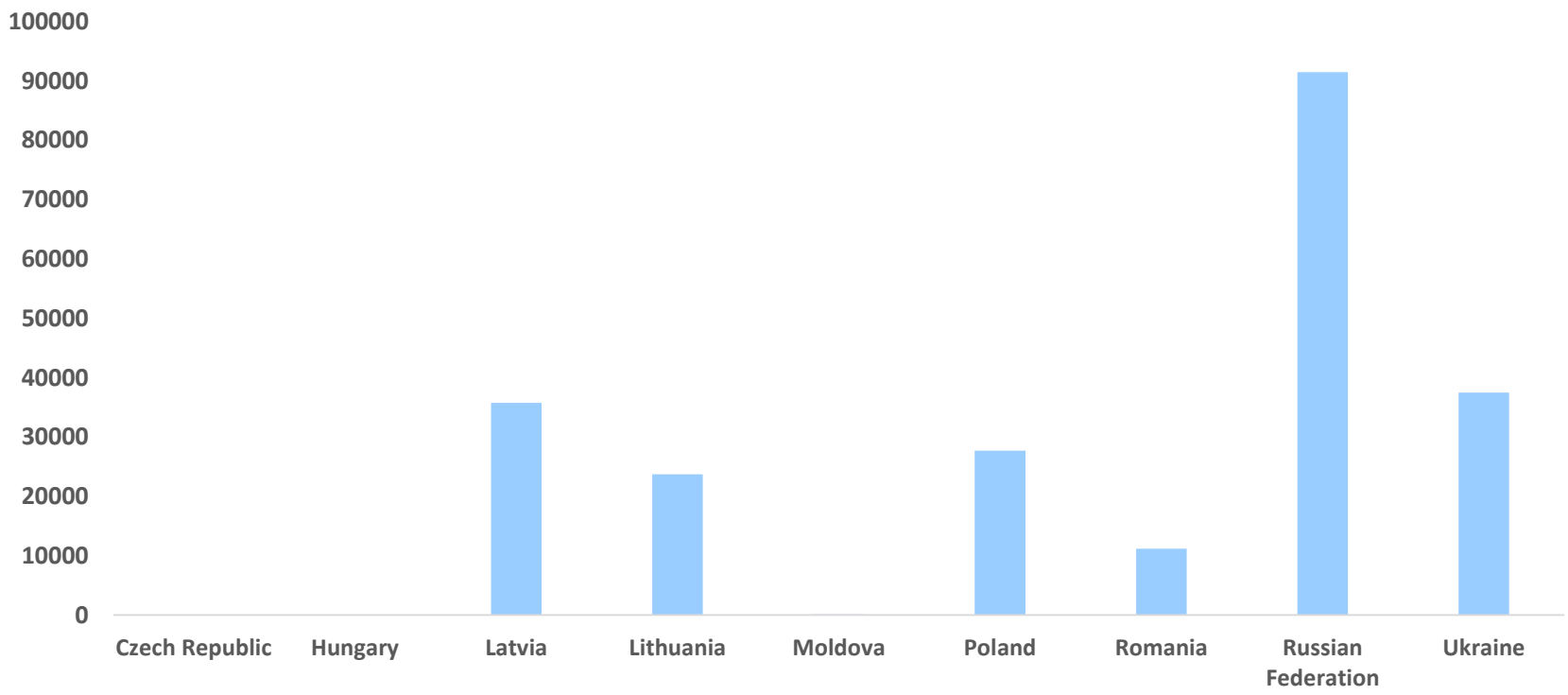
25% countries/territories

Number of on-going outbreaks in the Region, by month



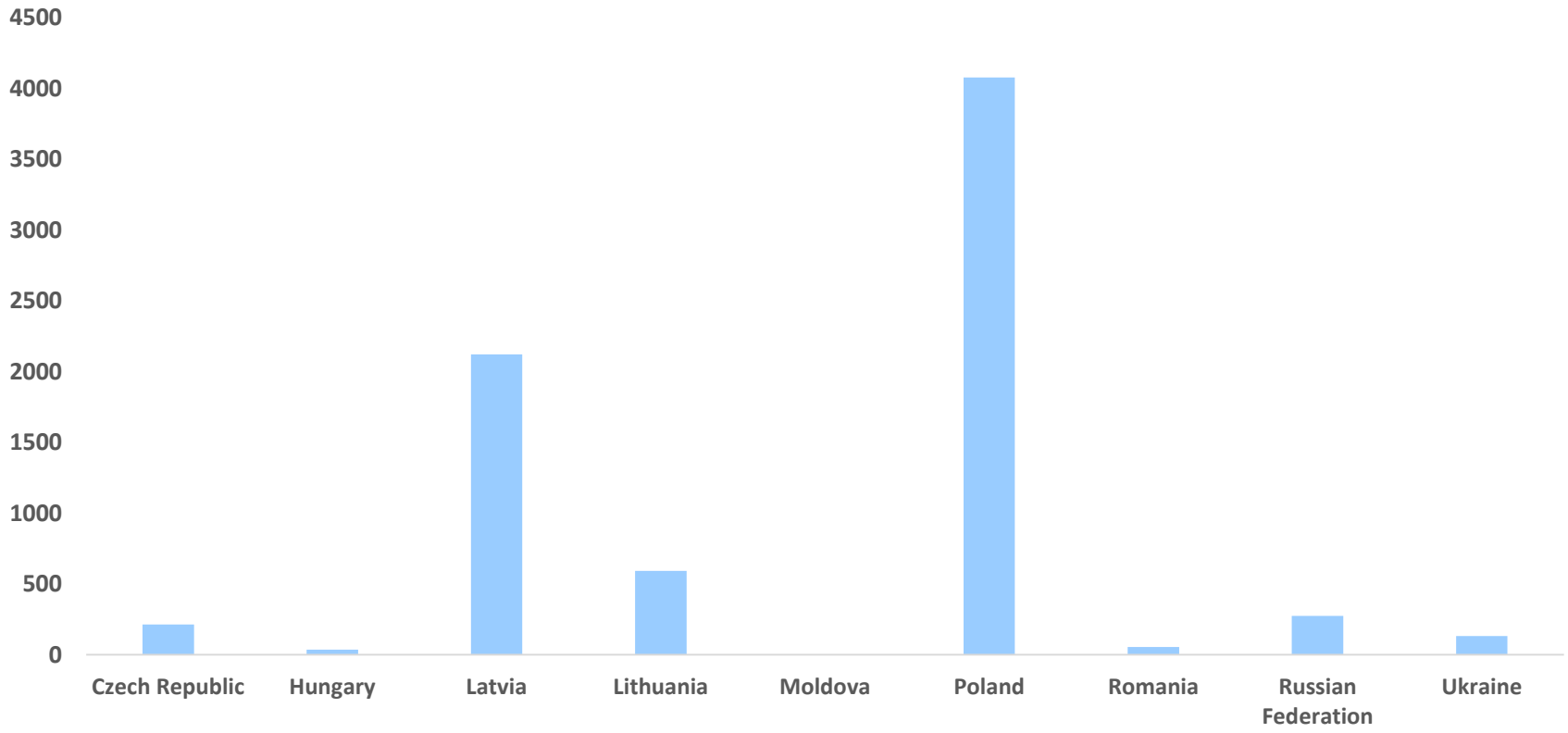
Losses in Europe since January 2017

More than 227,000 domestic pigs



Losses in Europe since January 2017

Around 7,500 wild boar



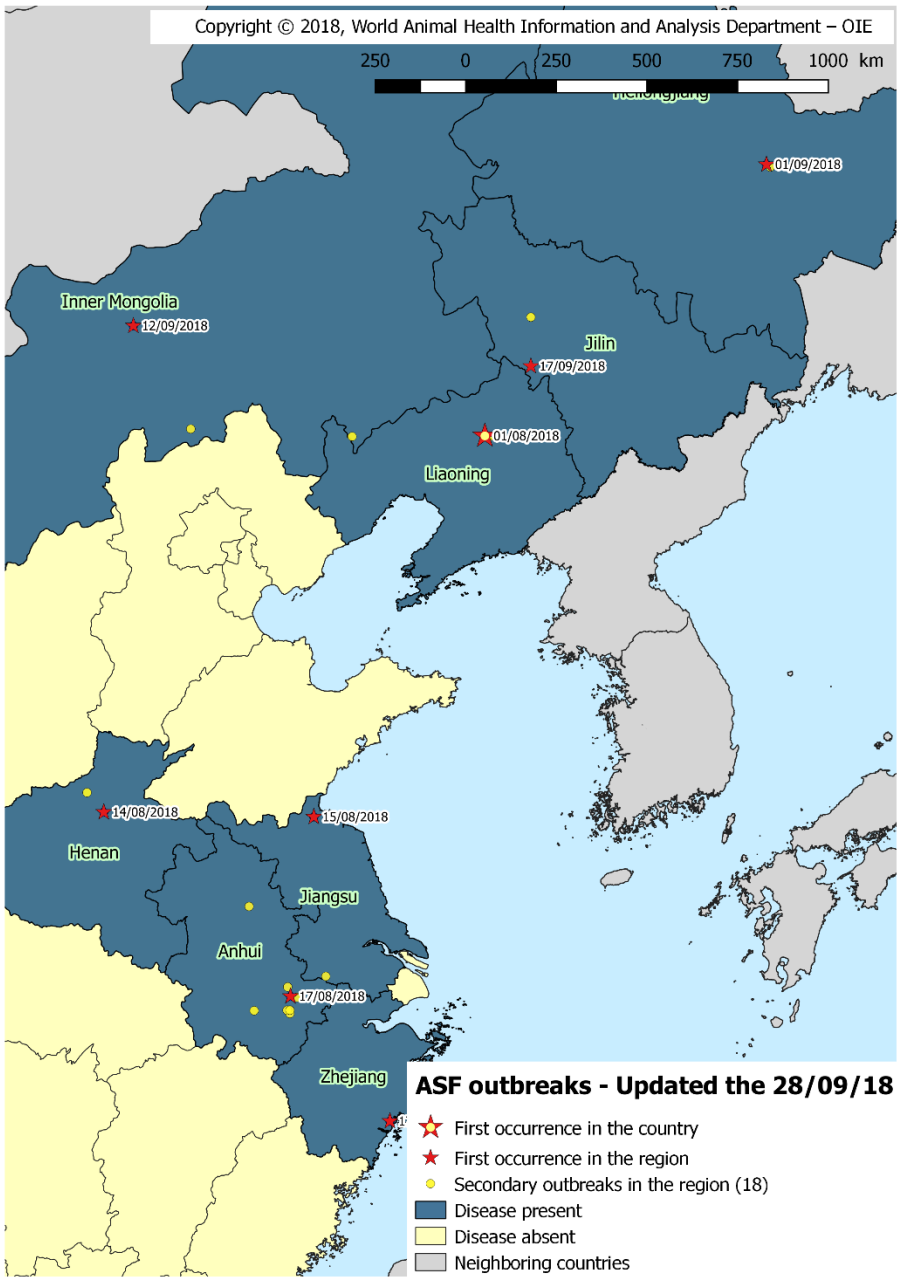
Situation of ASF with focus on China

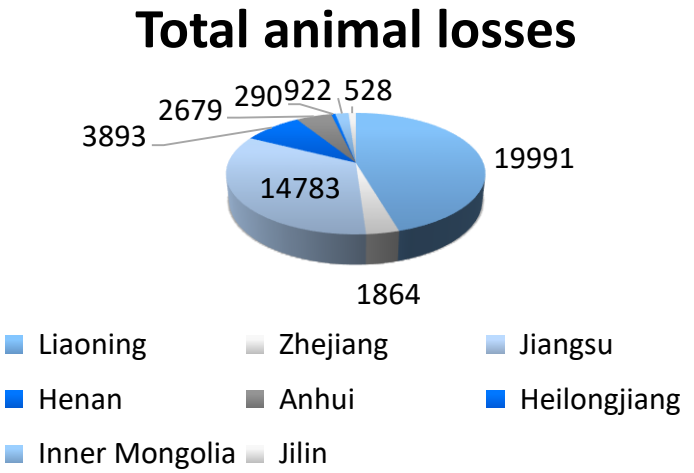
Update of the situation of African Swine fever in China

Country	Region	Last update	N° Outbreaks	Date of start event	Domestic				Total loss
					Susceptible	Cases	Dead	Killed and disposed of	
China	Liaoning	07/09/2018	5	01/08/2018	19991	54	47	19944	**19991**
	Zhejiang	07/09/2018	1	17/08/2018	1864	430	340	1524	**1864**
	Jiangsu	14/09/2018	2	15/08/2018	14783	627	97	14686	**14783**
	Henan	14/09/2018	2	14/08/2018	3893	178	94	3799	**3893**
	Anhui	14/09/2018	8	17/08/2018	2679	706	380	2299	**2679**
	Heilongjiang	14/09/2018	2	01/09/2018	290	65	22	268	**290**
	Inner Mongolia	28/09/2018	4	12/09/2018	922	57	48	874	**922**
	Jilin	28/09/2018	2	17/09/2018	528	64	59	469	**528**
TOTAL			**26**	**NA**	**44 950**	**2 181**	**1 087**	**43 863**	**44 950**

(Based on data received up to the 28/09/2018 through WAHIS Early Warning System)

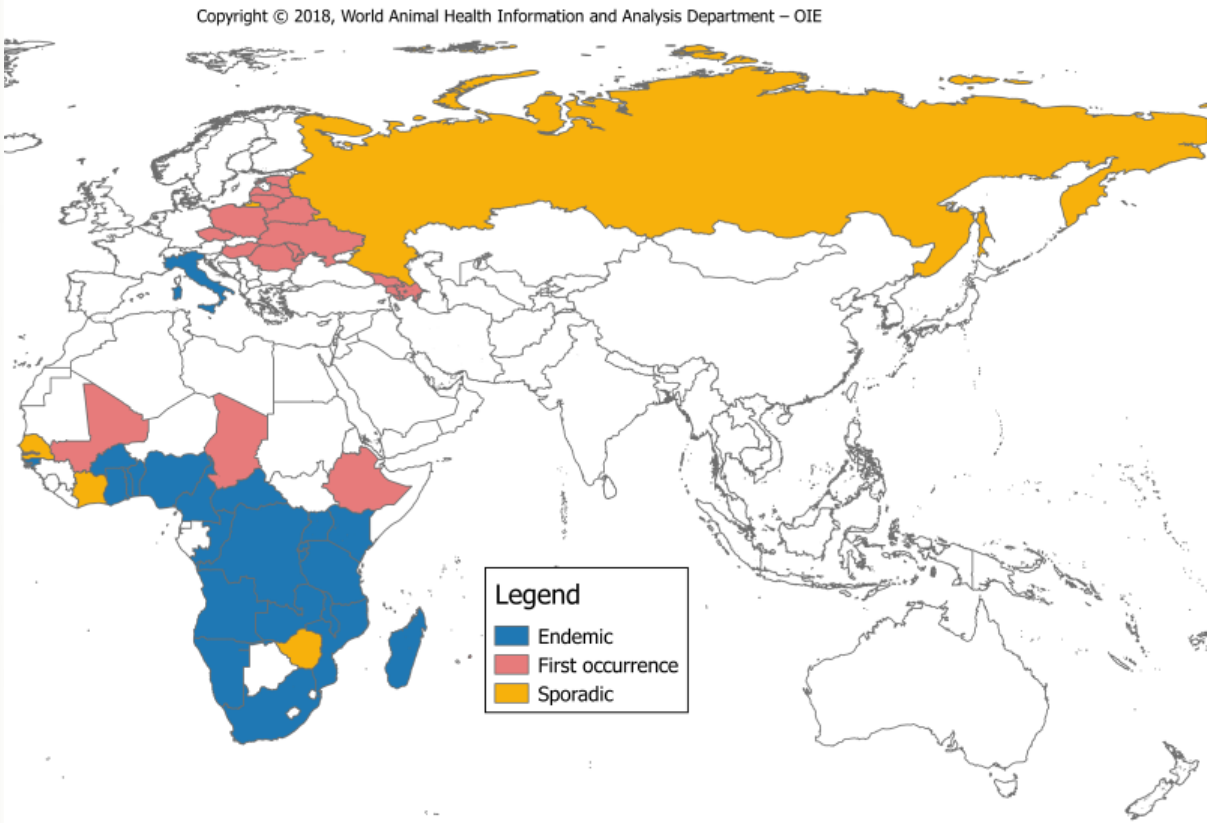
Update of the situation of African Swine fever in China





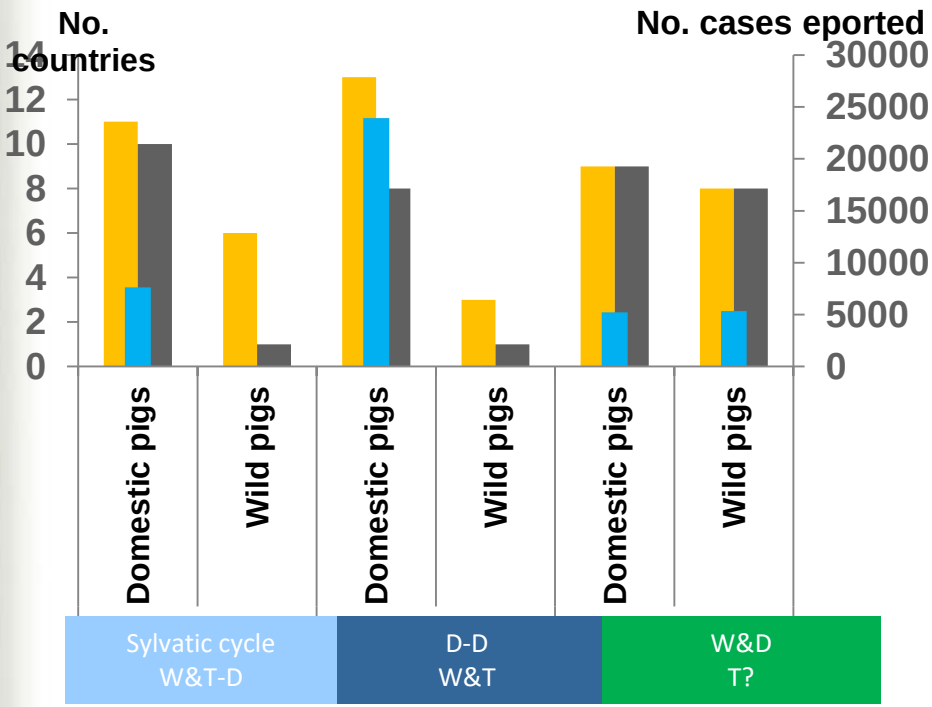
(Based on data received up to the 28/09/2018 through WAHIS Early Warning System)

Which are the regions and routes at higher risk for ASF introduction?

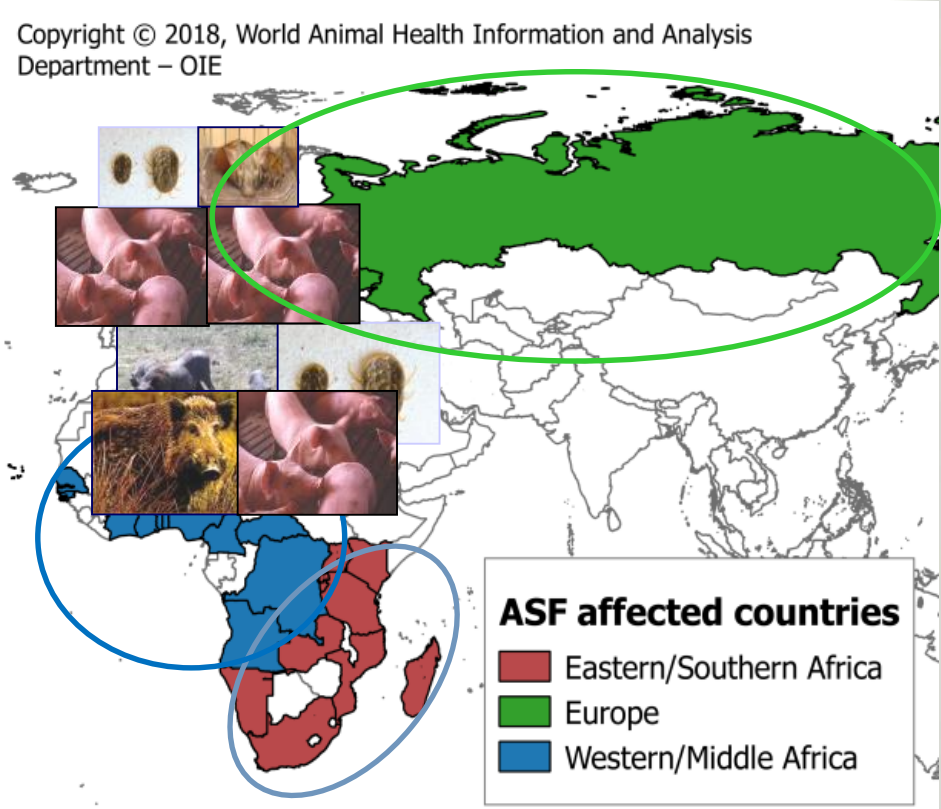


- **In Africa:** 75% countries categorised as endemic
- **In Europe:** the majority first occurrence

Reporting presence



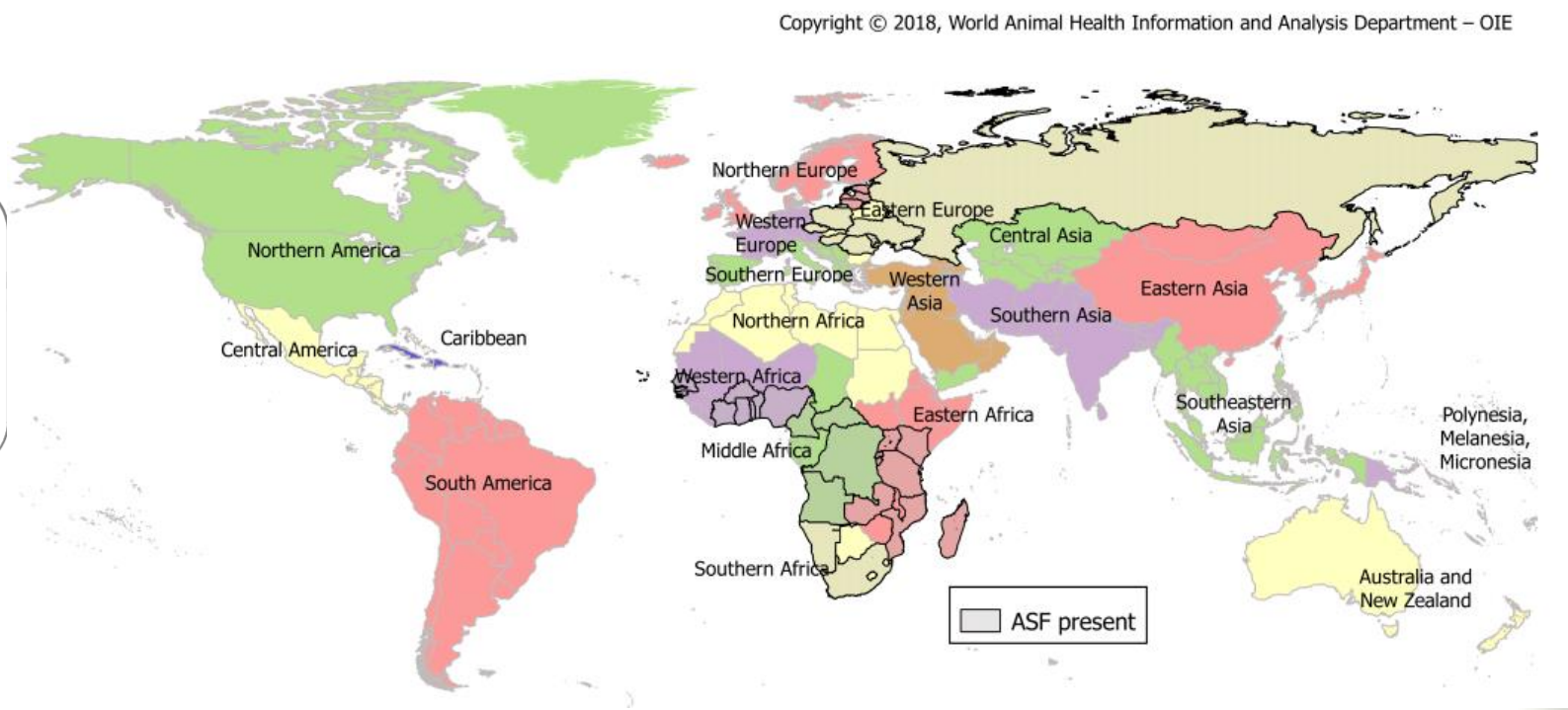
D: domestic pig; W: wild pig; T: ticks



3 scenarios → Origin of the risk in the Risk assessment

Qualitative assessment of the risk of ASF introduction into free regions through **7 pathways/routes of introduction**

Destination of risk = free ASF countries by regions*



* UN geographical regions

Qualitative risk assessment based on the use of **proxies** (factors that are likely to influence the risk for each pathway).

Per each pathway

Data by region

Proxy 1 → Categories for P1 values

Proxy 2 → Categories for P2 values

Proxy 3 → Categories for P3 values

Categorization (H-M-L-N)

Combination of risk categories

	Negligible	Low	Moderate	High
Negligible	Negligible	Negligible	Negligible	Negligible
Low	Negligible	Low	Low	Low
Moderate	Low	Low	Moderate	Moderate
High	Low	Moderate	Moderate	High

	Negligible	Low	Moderate	High
Negligible	Negligible	Low	Low	Moderate
Low	Low	Low	Moderate	Moderate
Moderate	Low	Moderate	Moderate	High
High	Moderate	Moderate	High	High

Risk results

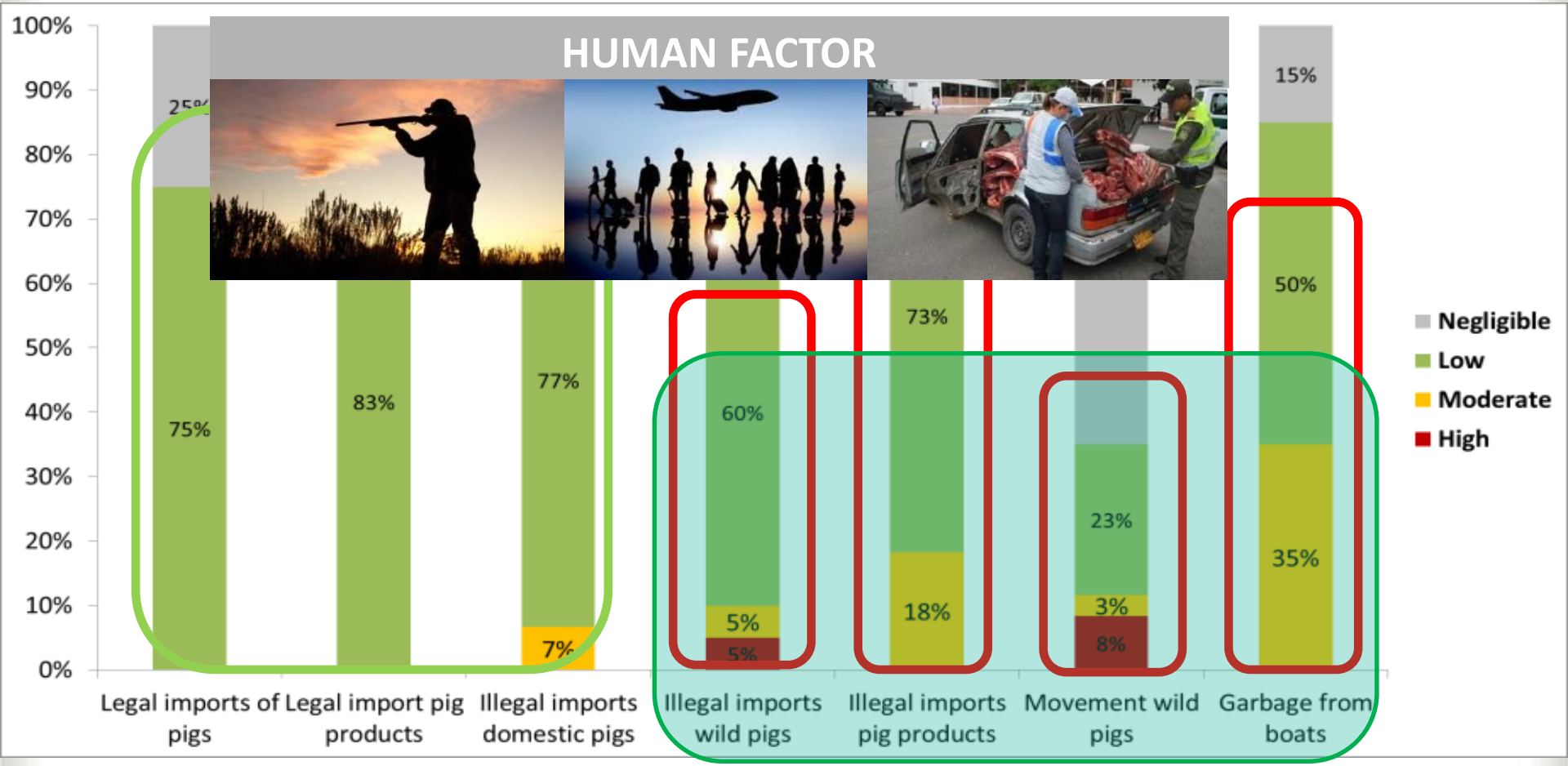
	Risk per origin/destination		
	EUROPE	WM AFRICA	ES AFRICA
Northern America	N	L	L
Central America	N	L	L
Caribbean	N	L	L
South America	N	L	L
Northern Europe	L	L	L
Western Europe	L	L	L
Eastern Europe	L	L	L
Southern Europe	L	L	L
Northern Africa	N	L	L
Western Africa	N	L	L
Middle Africa	N	L	L
Eastern Africa	N	M	M
Southern Africa	N	M	M
Western Asia	L	L	L
Central Asia	L	L	L
Eastern Asia	L	L	L
South-eastern Asia	N	L	L
Southern Asia	L	L	L
Australia and New Zealand	L	L	L
Polinesias, Micronesia, Melanesia	L	L	L

Per pathway

60 results: 20 destination r igins

Negligible (N)
Low(L)
Moderate (M)
High (H)

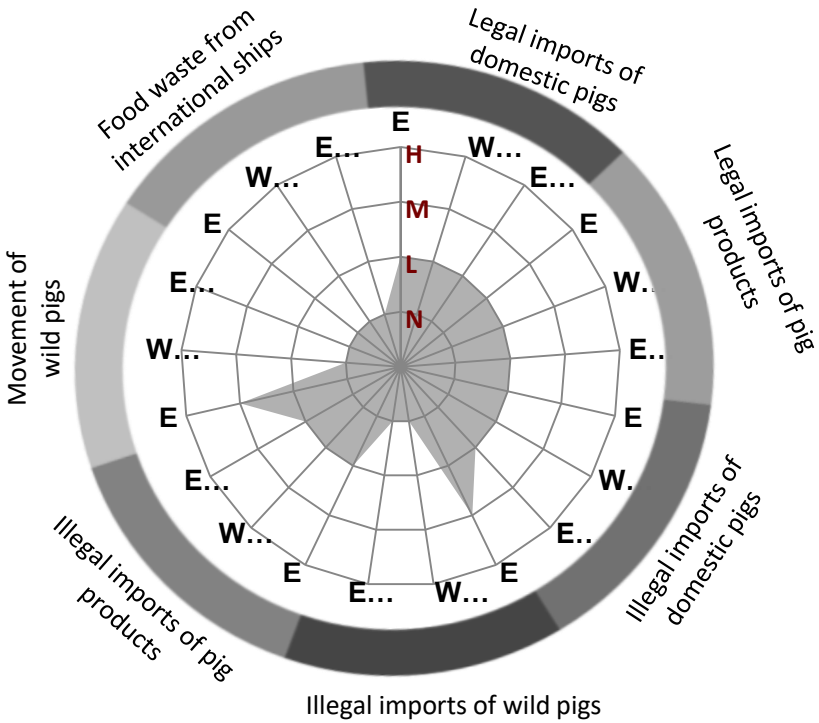
*** 7 analysed pathways = 230 results**


HUMAN FACTOR
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
25%
75%
83%
77%
7%
60%
5%
5%
73%
18%
23%
3%
8%
15%
50%
35%
Legal imports of pigs
Legal import pig products
Illegal imports domestic pigs
Illegal imports wild pigs
Illegal imports pig products
Movement wild pigs
Garbage from boats
Negligible
Low
Moderate
High

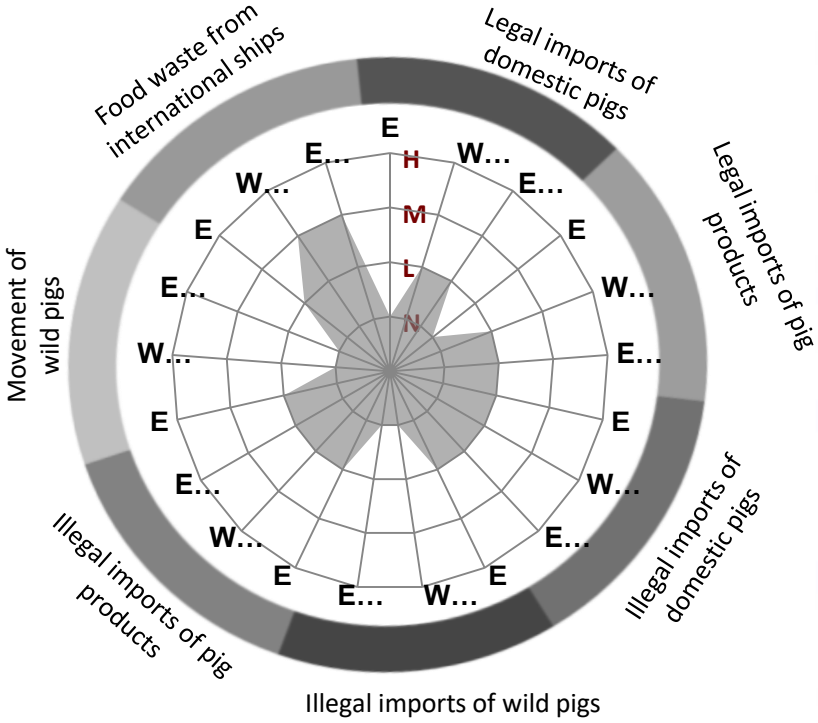
Individual risk profiles were produced for each region

Certain regions in Asia presented moderate risk in specific pathways.

Central Asia



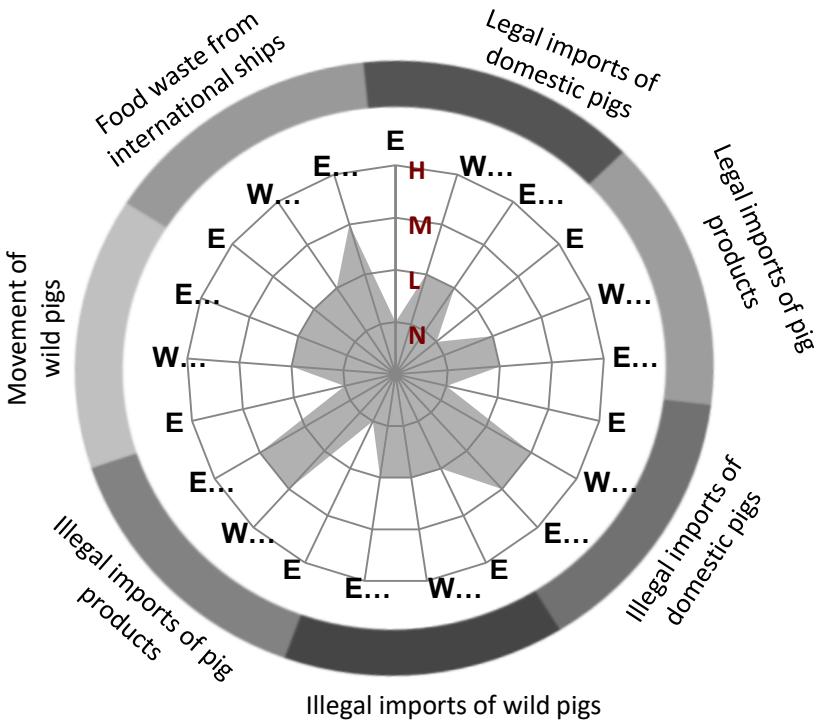
Southern Asia



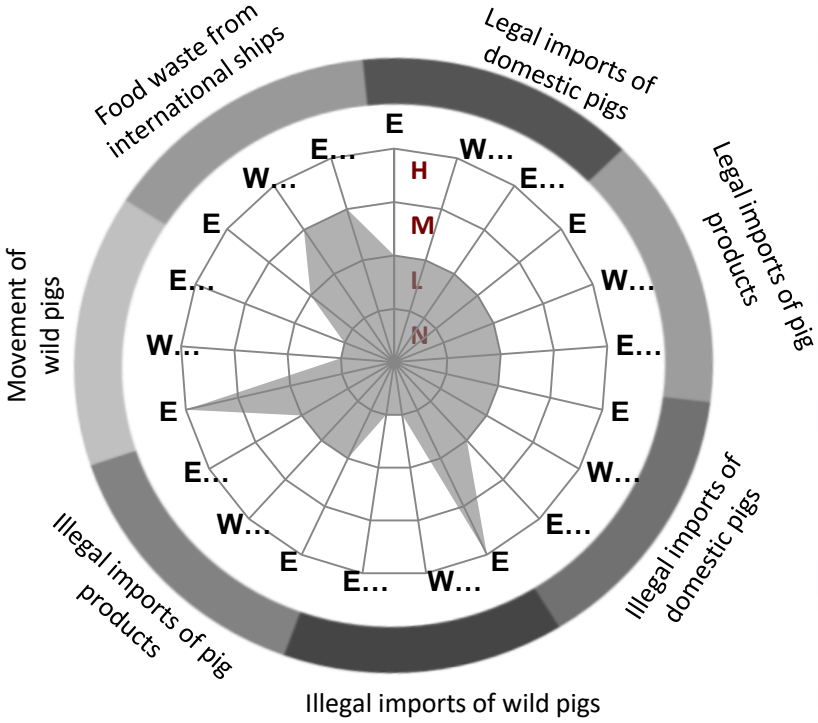
Individual risk profiles were produced for each region

ASF-free European and African countries presented the highest risks for ASF introduction but with different profiles between them.

Eastern Africa



Northern Europe



Long-distance spread

- Systematic involvement of humans

- Swill-feeding: a high-risk practice
  - Aiport and seaport waste
  - Illegal introduction of infected pork meat/products

No–compliance with the OIE *Terrestrial Code*

Long-distance spread

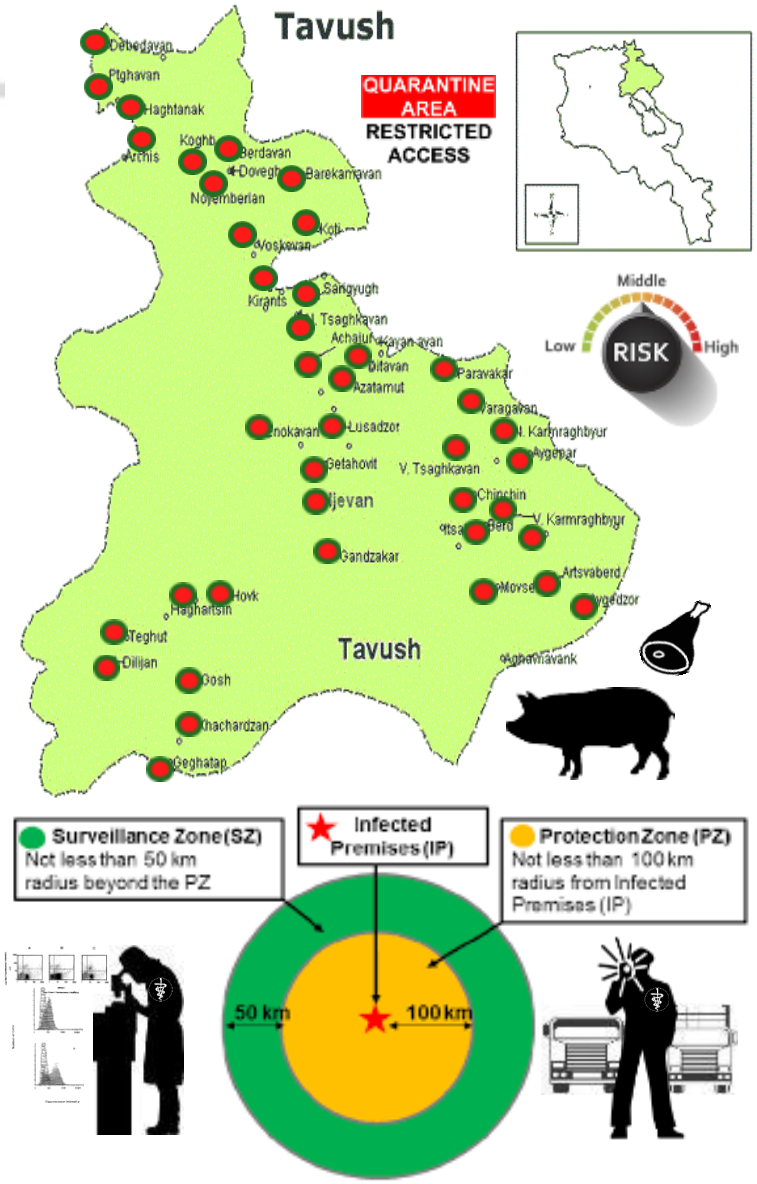
Table 3.– Primary source of African swine fever outbreaks in various countries

Year	Country	Source	Reference
1960	Portugal	Imported meat products	Neitz, 1963
1978	Brazil	Raw waste from an international airport	McDaniel, 1986
1978	Malta	Raw waste from a sea port	McDaniel, 1986
1978	Sardinia	Raw waste from a sea port	McDaniel, 1986
1980	Cuba	Importation of live pigs/pig products	McDaniel, 1986
1983	Italy	Importation of pig products	McDaniel, 1986

Basic biosecurity prevent the introduction of ASF

Example of Armenia

The disease spread mainly along the highways



Acknowledgment:
Grigor V. Grigoryan, DVM, MSc

Example of Armenia

- Remote village far from the highway
- Almost all farms infected except for one

- Discussion with the only farmer who prevented the introduction of ASF - 3 rules:
  - Only his wife and himself can enter the piggery
  - Change boots to enter/leave the piggery
  - No swill feeding

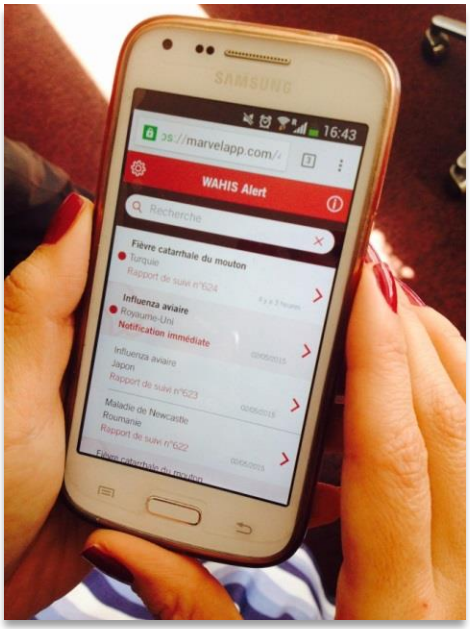
Acknowledgment: Klaus Depner

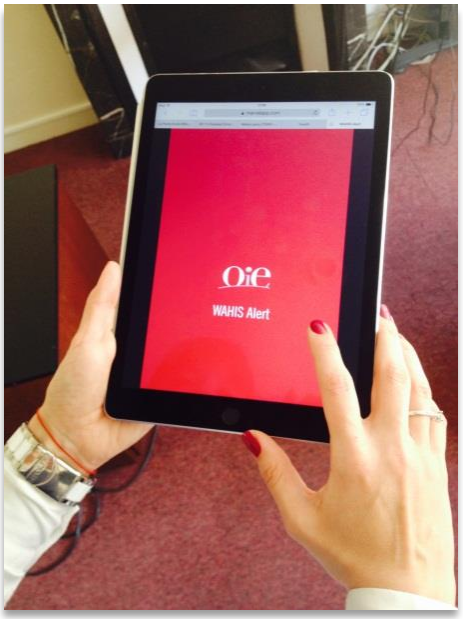
Notification obligations

Key role of the OIE ⟷ **Key responsability of the Countries**

- Need to know where the disease is
- OIE World Animal Health Information System
- Immediate notification in 24 hours

WAHIS App





To receive alert messages & follow-up reports as soon as they are validated by the OIE

WAHIS App

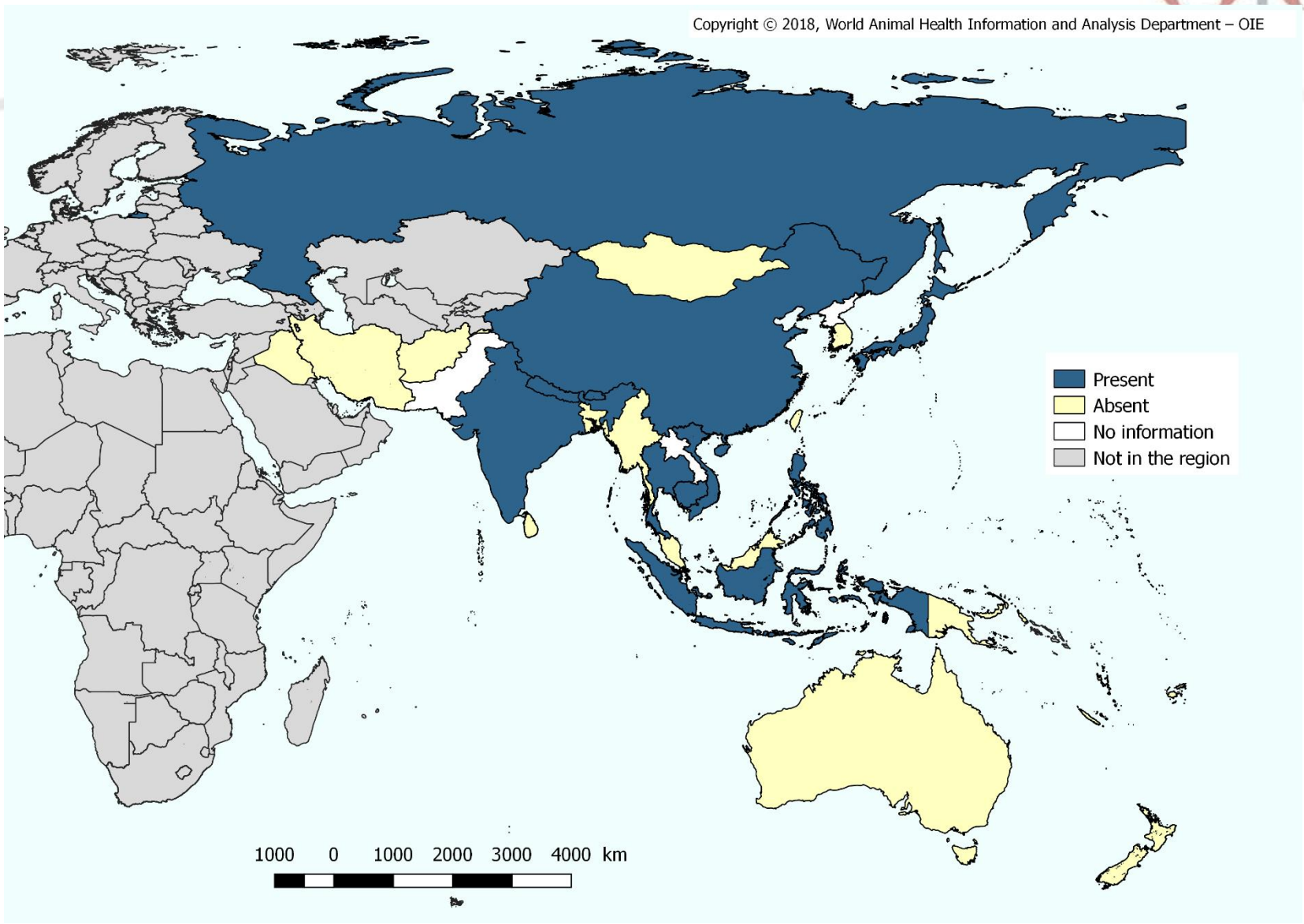
AIS
23:36
100%
WAHIS Alerts
Cancel
African swine fever
China (People's Rep. of)
Follow-up report 1
17/09/2018
African swine fever
China (People's Rep. of)
Follow-up report 6
14/09/2018
African swine fever
China (People's Rep. of)
Follow-up report 3
14/09/2018
African swine fever
China (People's Rep. of)
Follow-up report 2
14/09/2018
Foot and mouth disease
China (People's Rep. of)
Follow-up report 2
14/09/2018
African swine fever
China (People's Rep. of)

AIS
23:39
100%
WAHIS Alerts Details
African swine fever
China (People's Rep. of)
REPORT SUMMARY
NEW OUTBREAKS (1)
OUTBREAK 1 BIELIGUTAI TOWNSHIP, ABAGA, XILINGOL LEAGUE, INNER MONGOLIA
SUMMARY OF OUTBREAKS (TOTAL OUTBREAKS : 1)
EPIDEMIOLOGY
CONTROL MEASURES
DIAGNOSTIC TEST RESULTS
FUTURE REPORTING
MAP OF OUTBREAK LOCATIONS

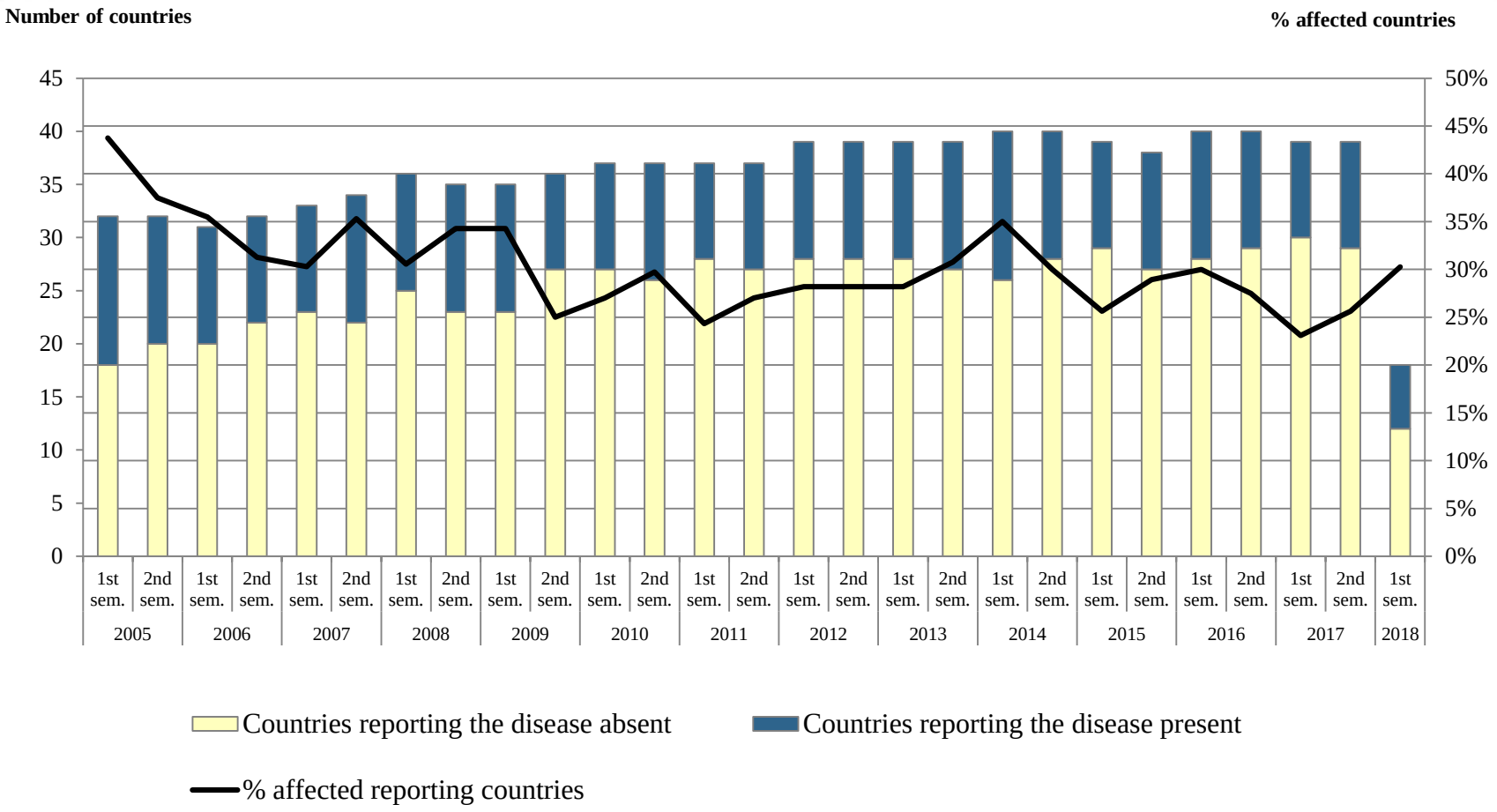
AIS
23:36
100%
WAHIS Alerts Details
African swine fever
China (People's Rep. of)
FUTURE REPORTING
MAP OF OUTBREAK LOCATIONS
Russia
Kazakhstan
Mongolia
China (People's Rep. of)
Nepal
India
Myanmar
Thailand
Sri Lanka
Malaysia
Indonesia
Continuing (domestic)
No information
v1.06

Classical swine fever (CSF)

Distribution of CSF in Asia, the Far East and Oceania in 2017-2018

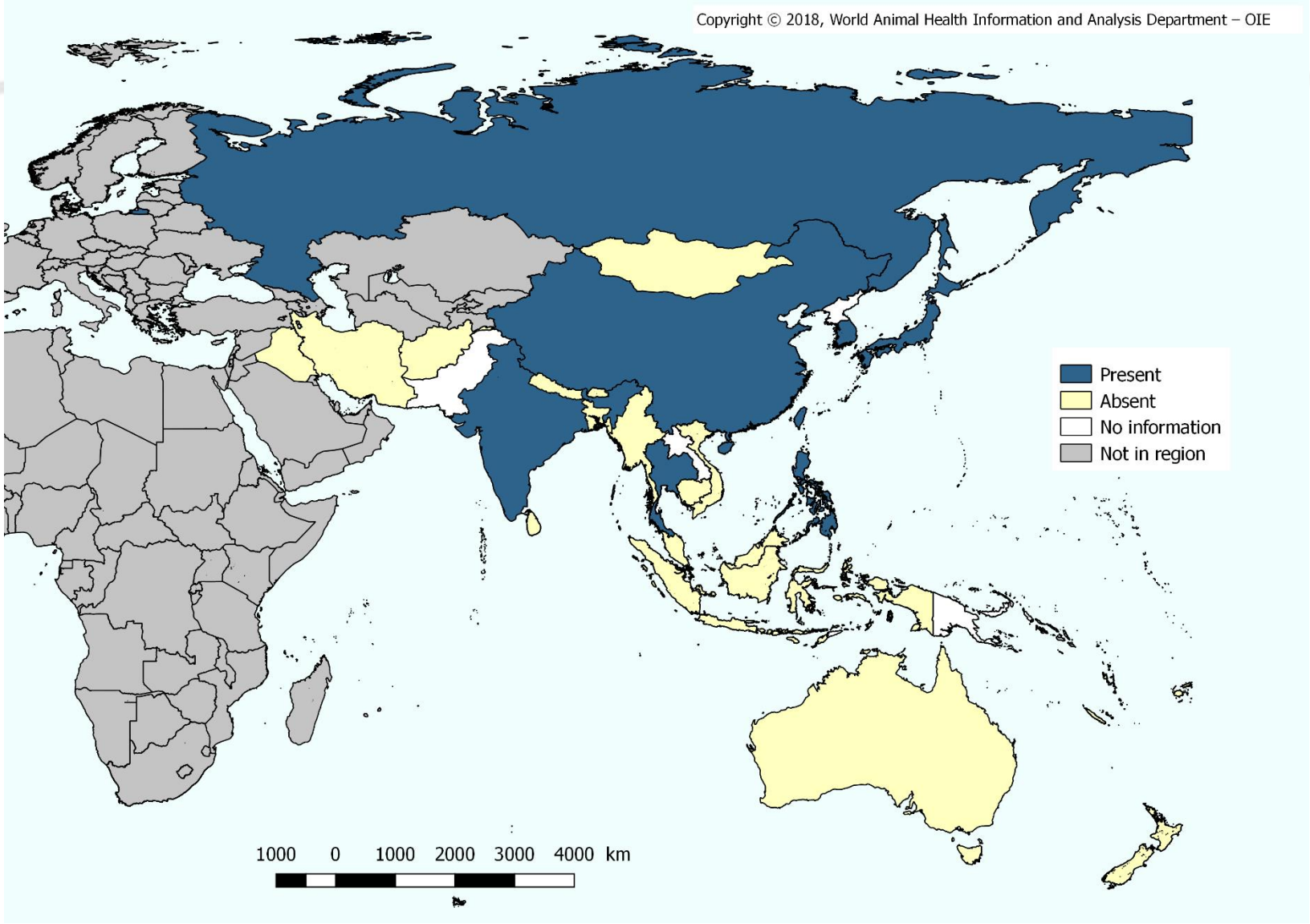


Percentage of the reporting countries and territories that notified CSF present in Asia, the Far East and Oceania, by semester, between 2005 and the first semester of 2018

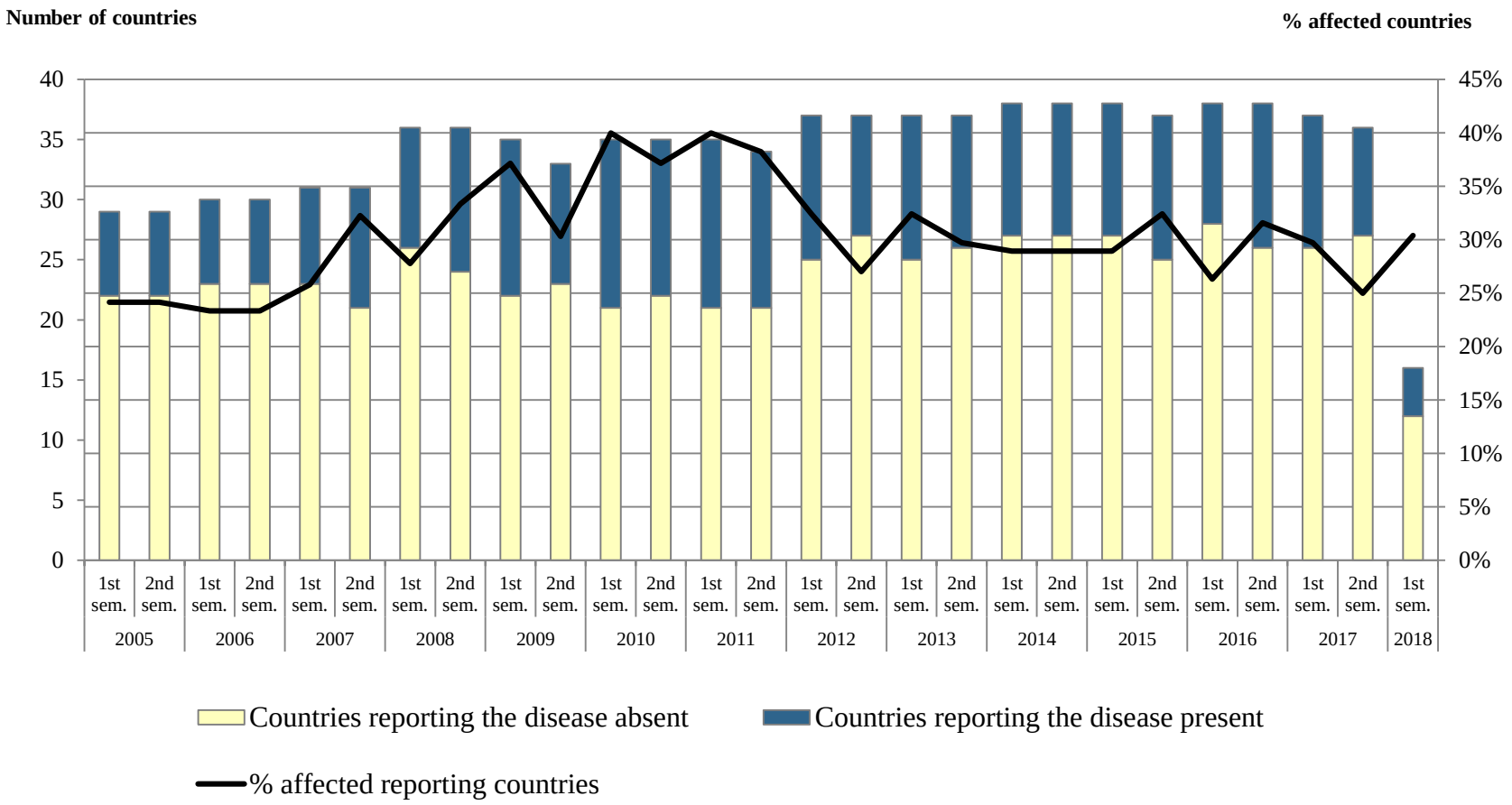


Porcine reproductive and respiratory syndrome

Distribution of PRRS in Asia, the Far East and Oceania in 2017-2018

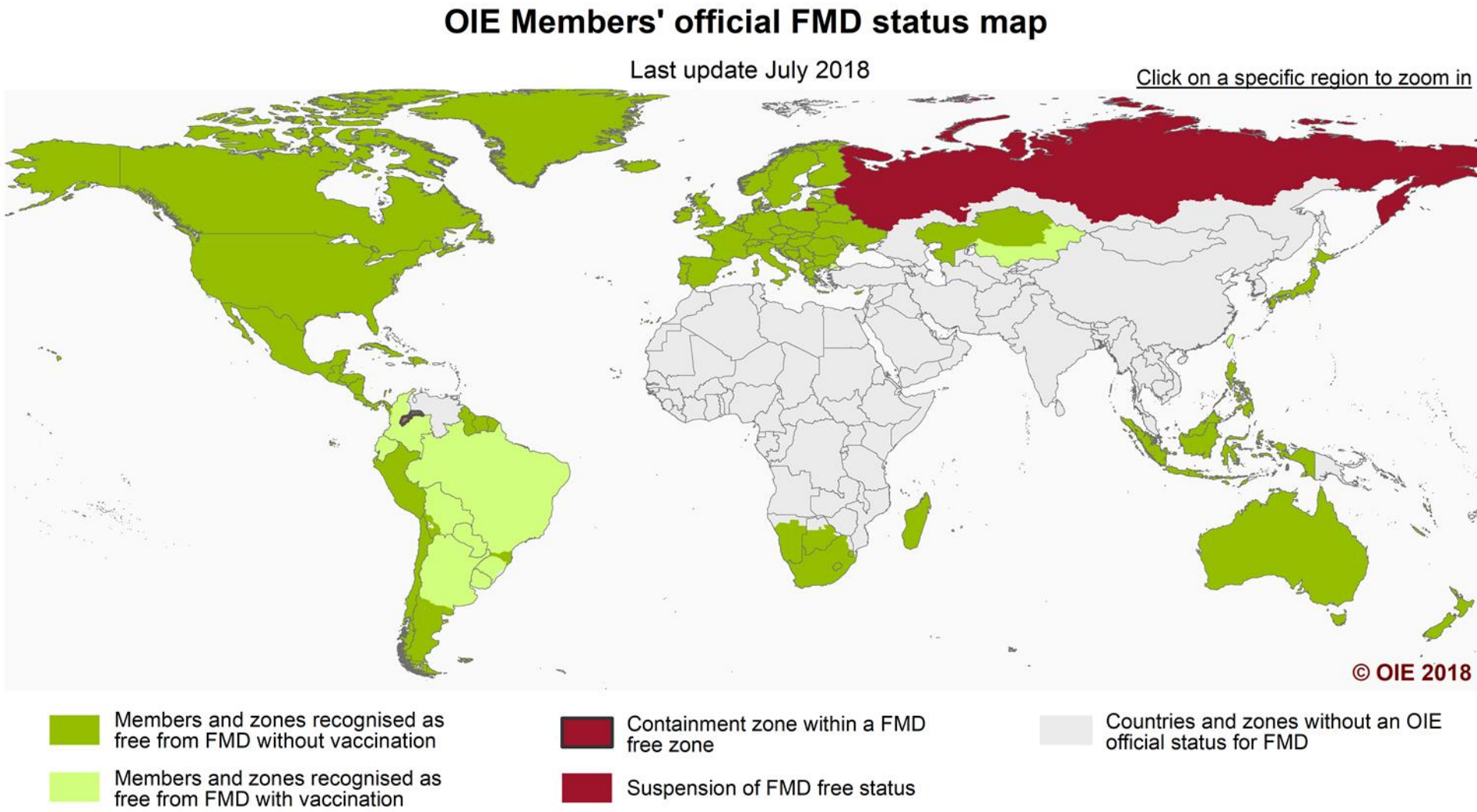


Percentage of the reporting countries and territories that notified PRRS present, in Asia, the Far East and Oceania by semester, between 2005 and the first semester of 2018

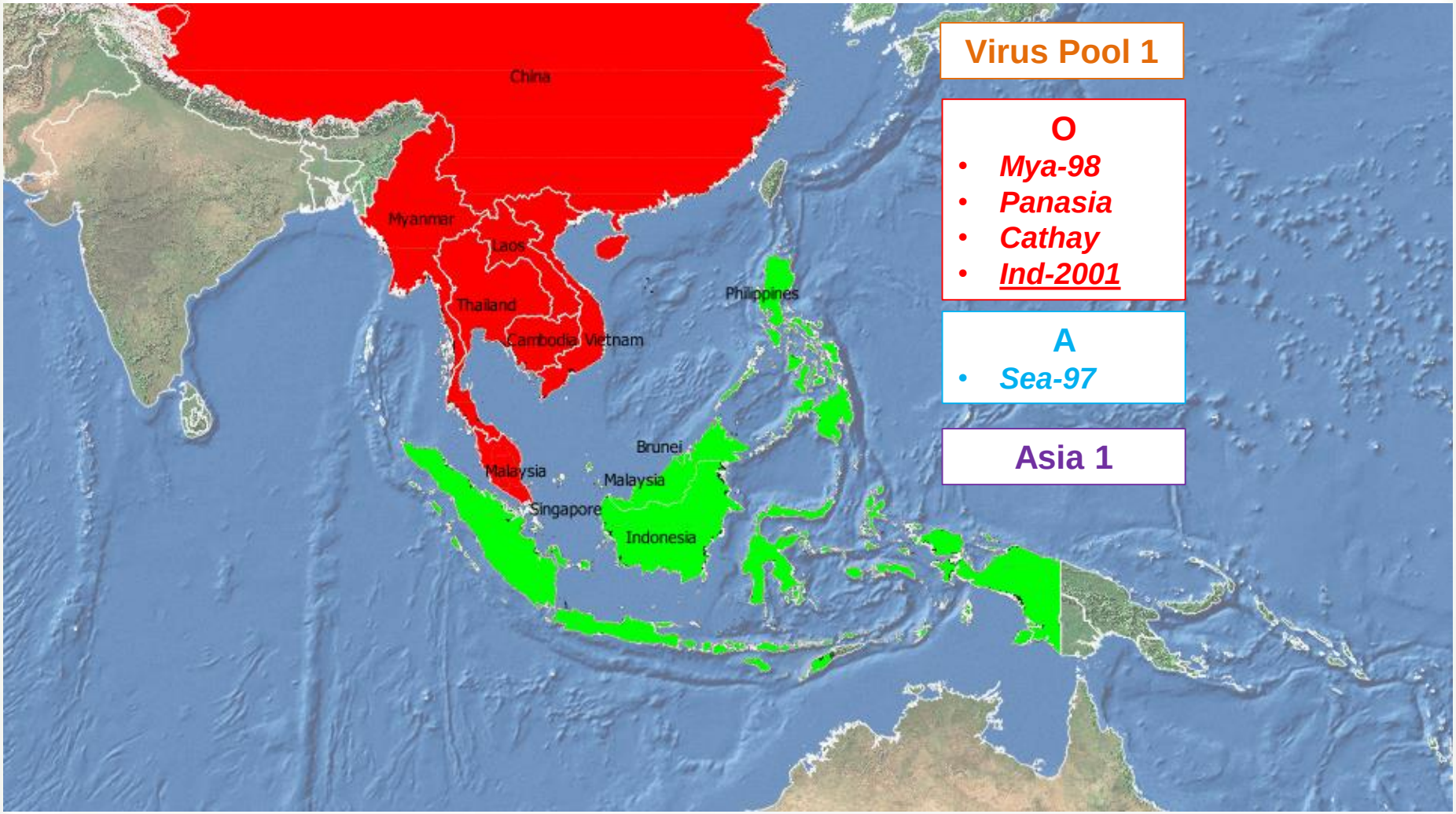


Foot and mouth Disease

Global FMD Situation



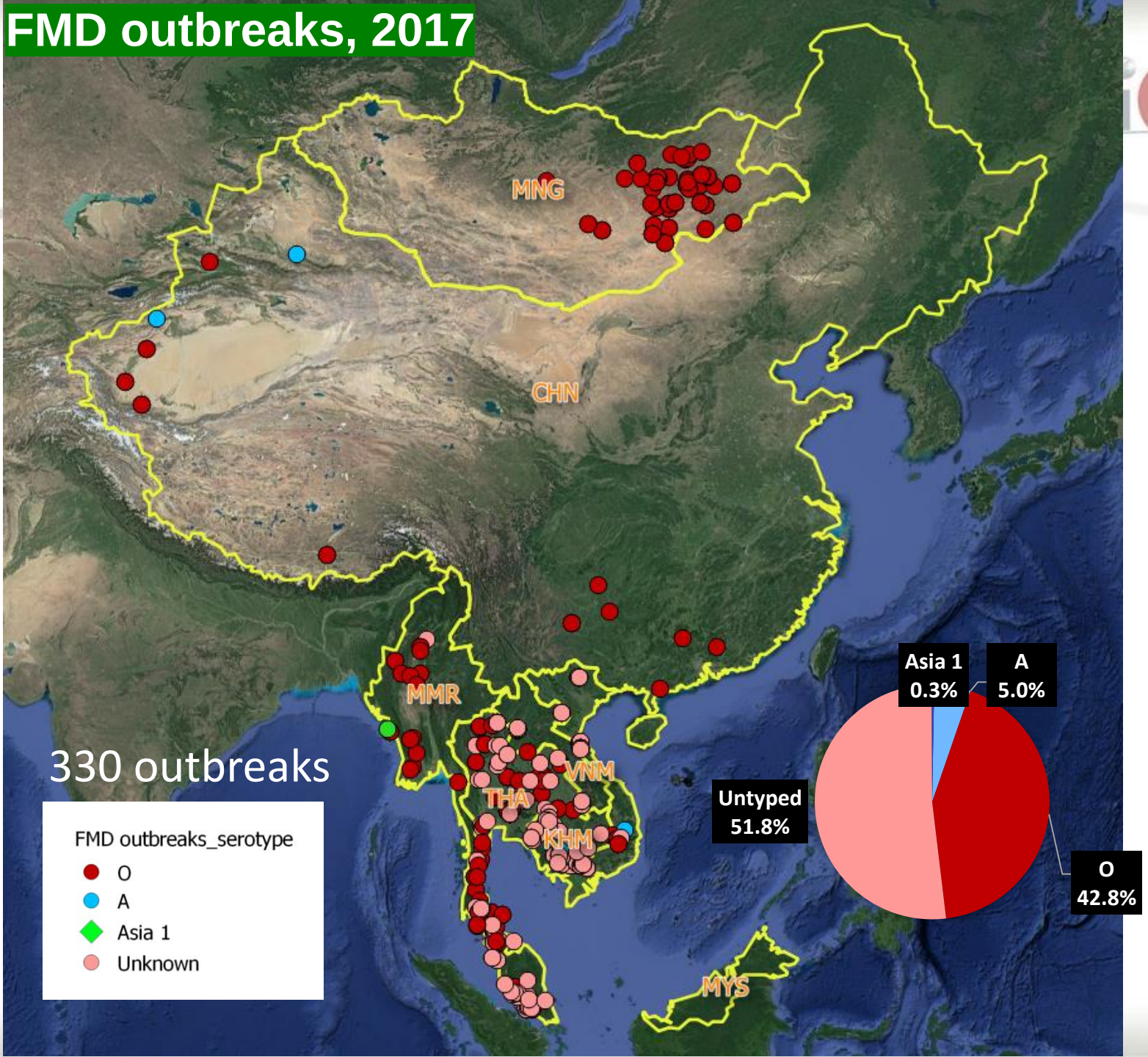
FMD Viruses in Pool 1 (SE and East Asia)



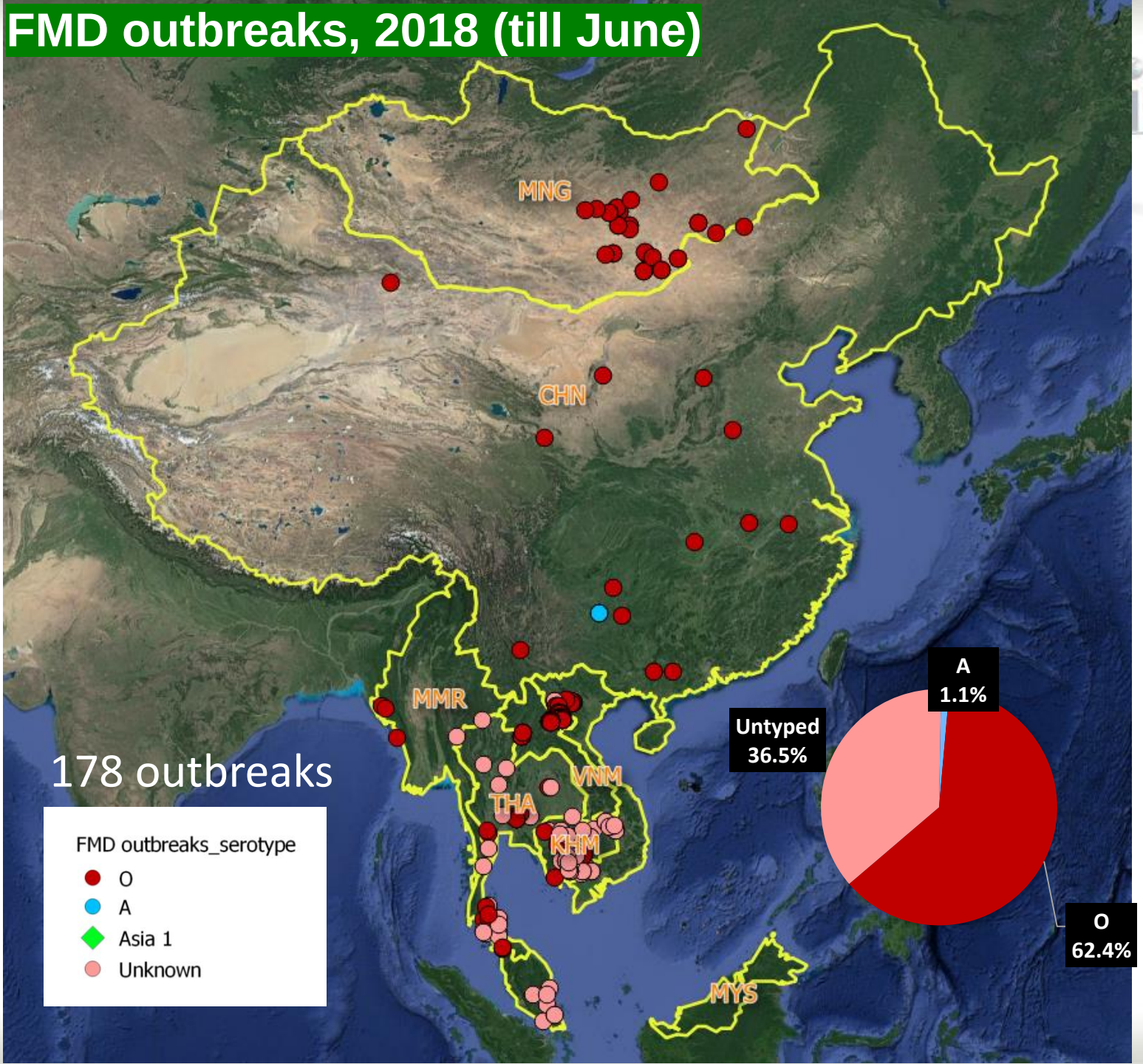
FMD viruses in Pool 1

Serotype	Topotype	Remarks
O	South East Asia	Myanmar 98 endemic in SE Asia; Cambodia 94 never detected for a long time
	Pan Asia	Panasia1 detected SE Asia in late 1990s; **India/2001/d detected in 2015**
	Cathay	1st detected in Hong Kong in early 1990s; detected in Thailand and Vietnam
A	South East Asia	Indigenous in SE Asia; reported in China , Mongolia and Korea
Asia 1	Asian	Last reported in Vietnam in 2007 and in China in 2009; Isolated case in Myanmar in 2017

FMD outbreaks, 2017



FMD outbreaks, 2018 (till June)



Genotyping of FMDVs 2017

Country	Serotype O	Topotype…				Serotype A	Topotype	Serotype Asia1
		SEA/ Mya-98	ME-SA/ PanAsia	ME-SA/ Ind-2001d	Cathay		ASIA/ Sea-97	Asia/ G-VIII
Cambodia	+					+		
China	+	+		+		+	+	
Lao PDR	+	+	+					
Myanmar	+	+		+				+
Malaysia	+							
Mongolia	+	+		+				
Thailand	+	+	+	+		+	+	
Viet Nam	+	+	+	+	+	+	+	

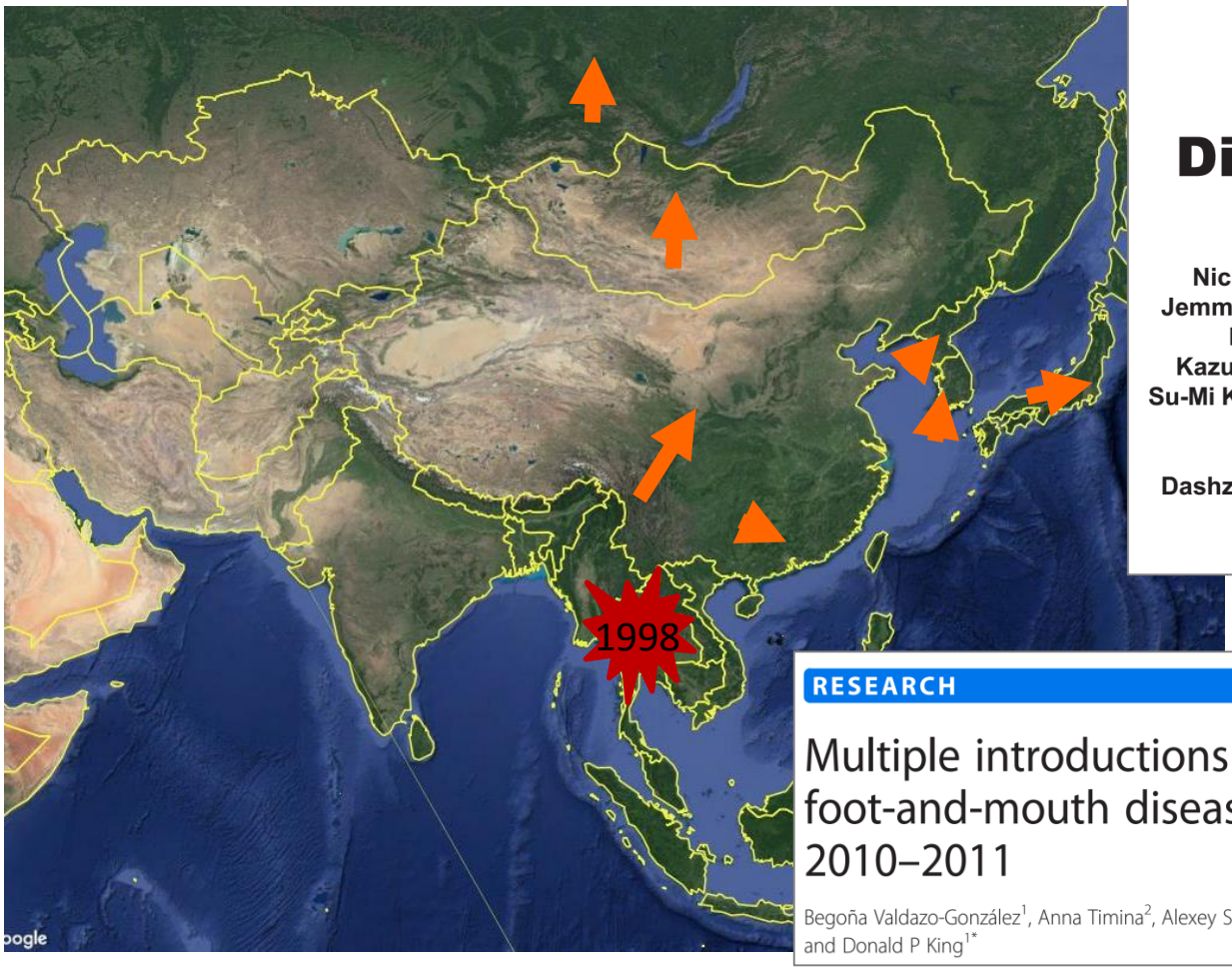
Genotyping of FMDVs 2018 (till June)

Country	Serotype O	Topotype…				Serotype A	Topotype	Serotype Asia1
		SEA/ Mya-98	ME-SA/ PanAsia	ME-SA/ Ind-2001d	Cathay		ASIA/ Sea-97	Asia/ G-VIII
Cambodia	+							
China	+	+	+	+	+	+	+	
Lao PDR	+							
Myanmar	+							
Malaysia	+							
Mongolia	+	+		+				
Thailand	+		+	+		+	+	
Viet Nam	+					+		

FMDV genotyping capability needs to be further improved in SEA

Trans-boundary Spread of FMD

O/SEA/Mya-98



Southeast Asian Foot-and-Mouth Disease Viruses in Eastern Asia

Nick J. Knowles, JiJun He, Youjun Shang, Jemma Wadsworth, Begoña Valdazo-González, Hiroyuki Onosato, Katsuhiko Fukai, Kazuki Morioka, Kazuo Yoshida, In-Soo Cho, Su-Mi Kim, Jong-Hyeon Park, Kwang-Nyeong Lee, Geraldine Luk, Vladimir Borisov, Alexey Scherbakov, Anna Timina, Dashzeveg Bold, Tung Nguyen, David J. Paton, Jef M. Hammond, Xiangtao Liu, and Donald P. King

RESEARCH Open Access

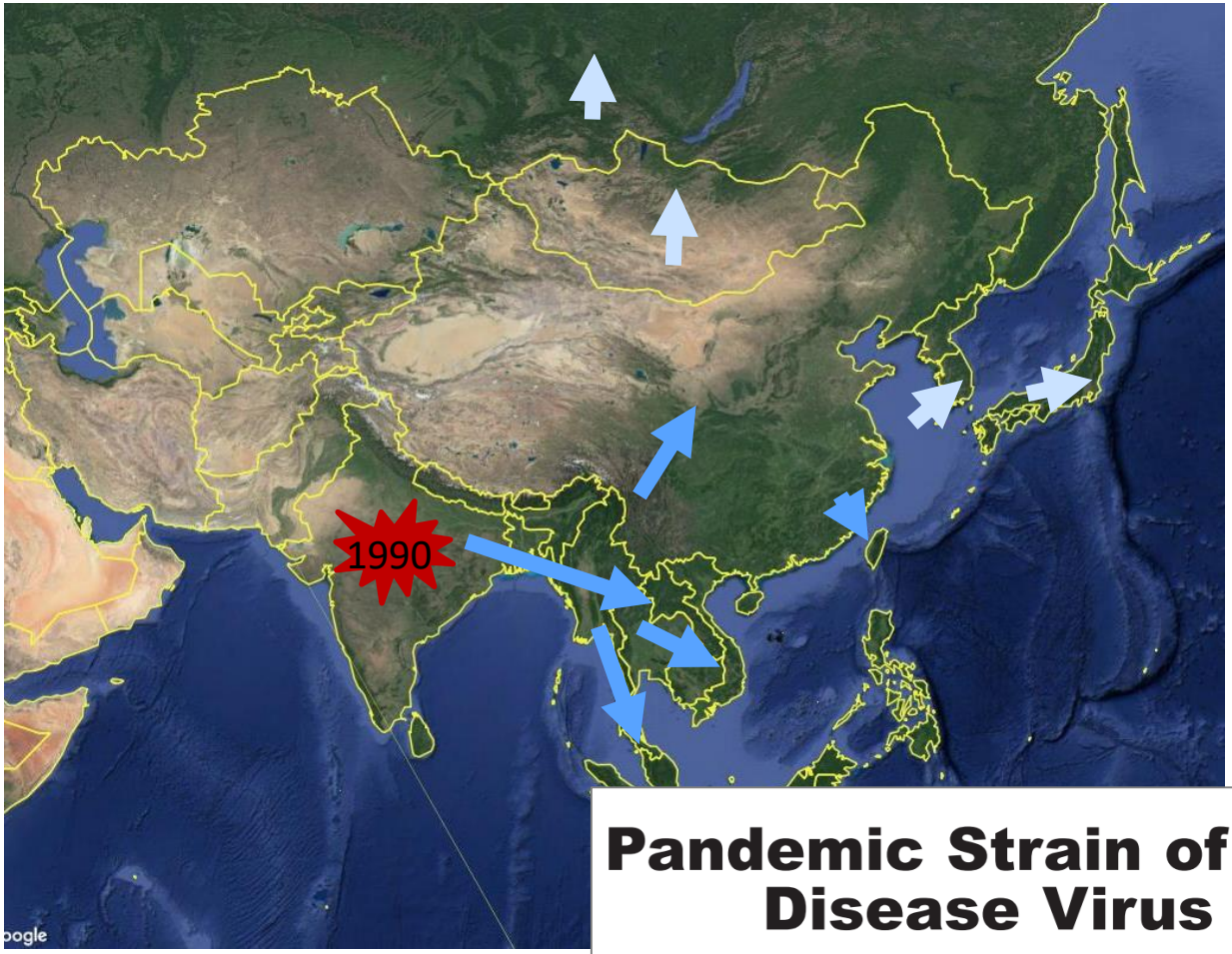
Multiple introductions of serotype O foot-and-mouth disease viruses into East Asia in 2010–2011

Begoña Valdazo-González[1], Anna Timina[2], Alexey Scherbakov[2], Nor Faizah Abdul-Hamid[1,3], Nick J Knowles[1] and Donald P King[1*]

O/ME-SA/PanAsia

O/ME-SA/PanAsia

O/ME-SA/PanAsia



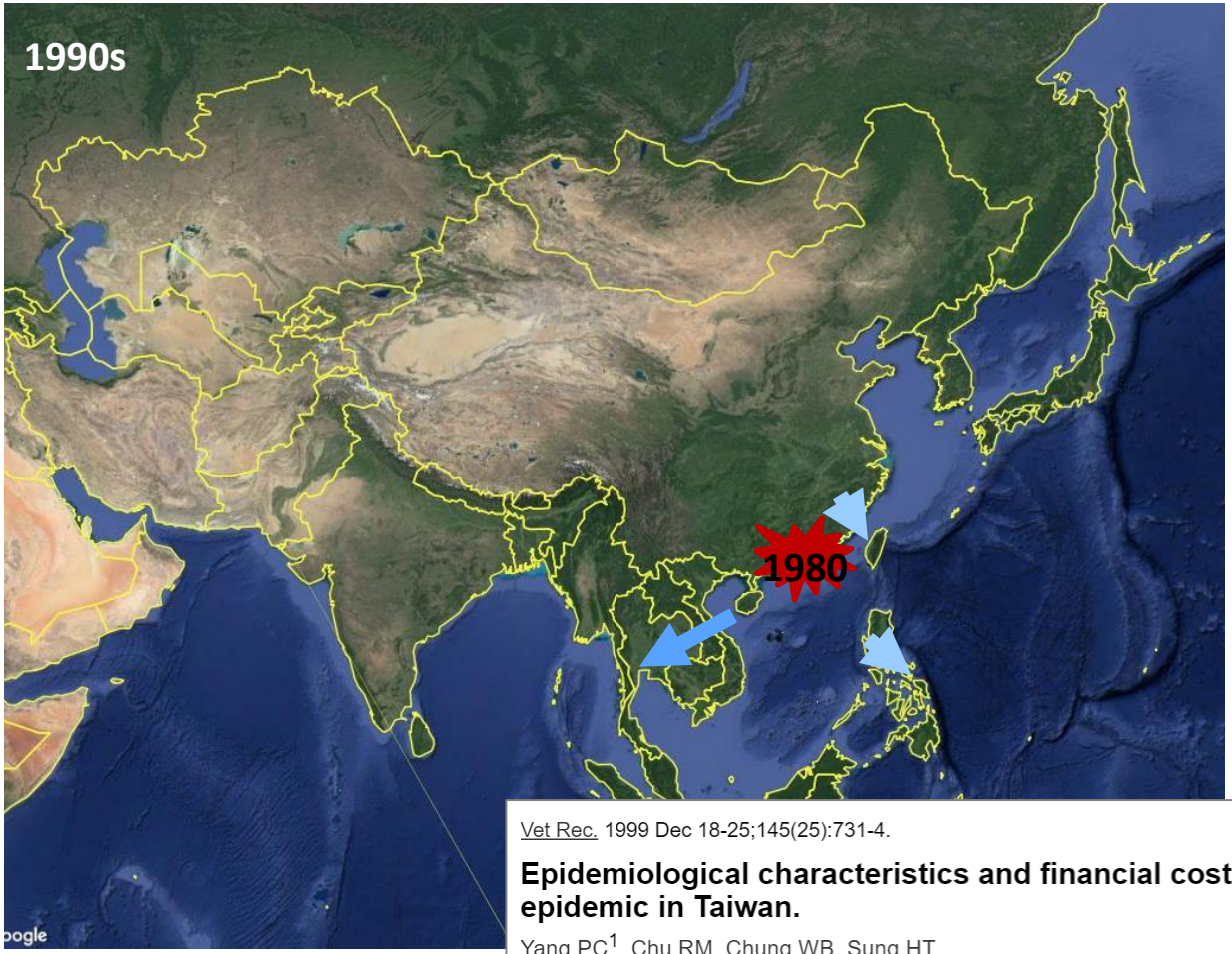
Pandemic Strain of Foot-and-Mouth Disease Virus Serotype O

Nick J. Knowles,* Alan R. Samuel,* Paul R. Davies,* Rebecca J. Midgley,* and Jean-François Valarcher*

O/Cathay

O/Cathay

O/Cathay



Vet Rec. 1999 Dec 18-25;145(25):731-4.

Epidemiological characteristics and financial costs of the 1997 foot-and-mouth disease epidemic in Taiwan.

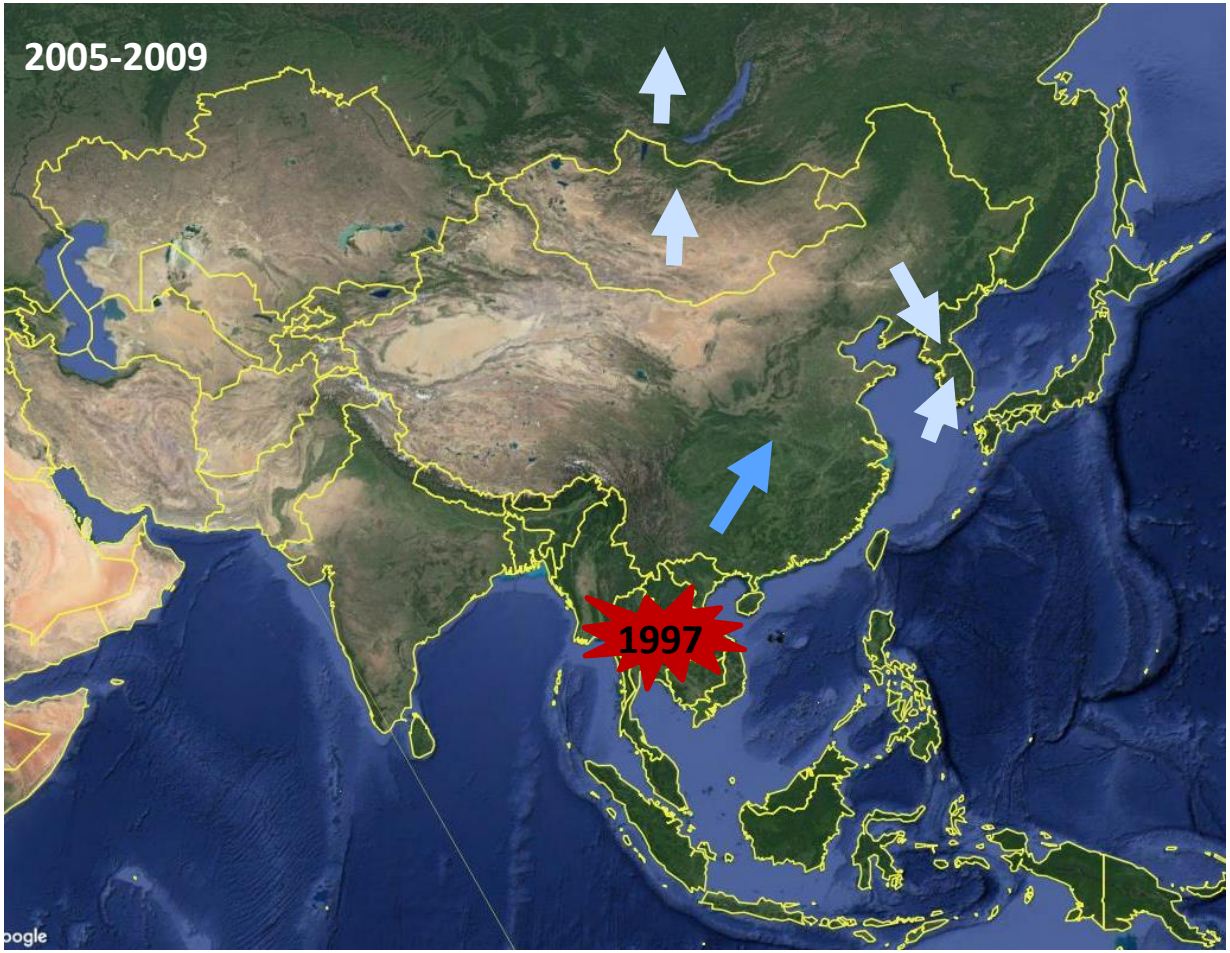
Yang PC[1], Chu RM, Chung WB, Sung HT.

Author information

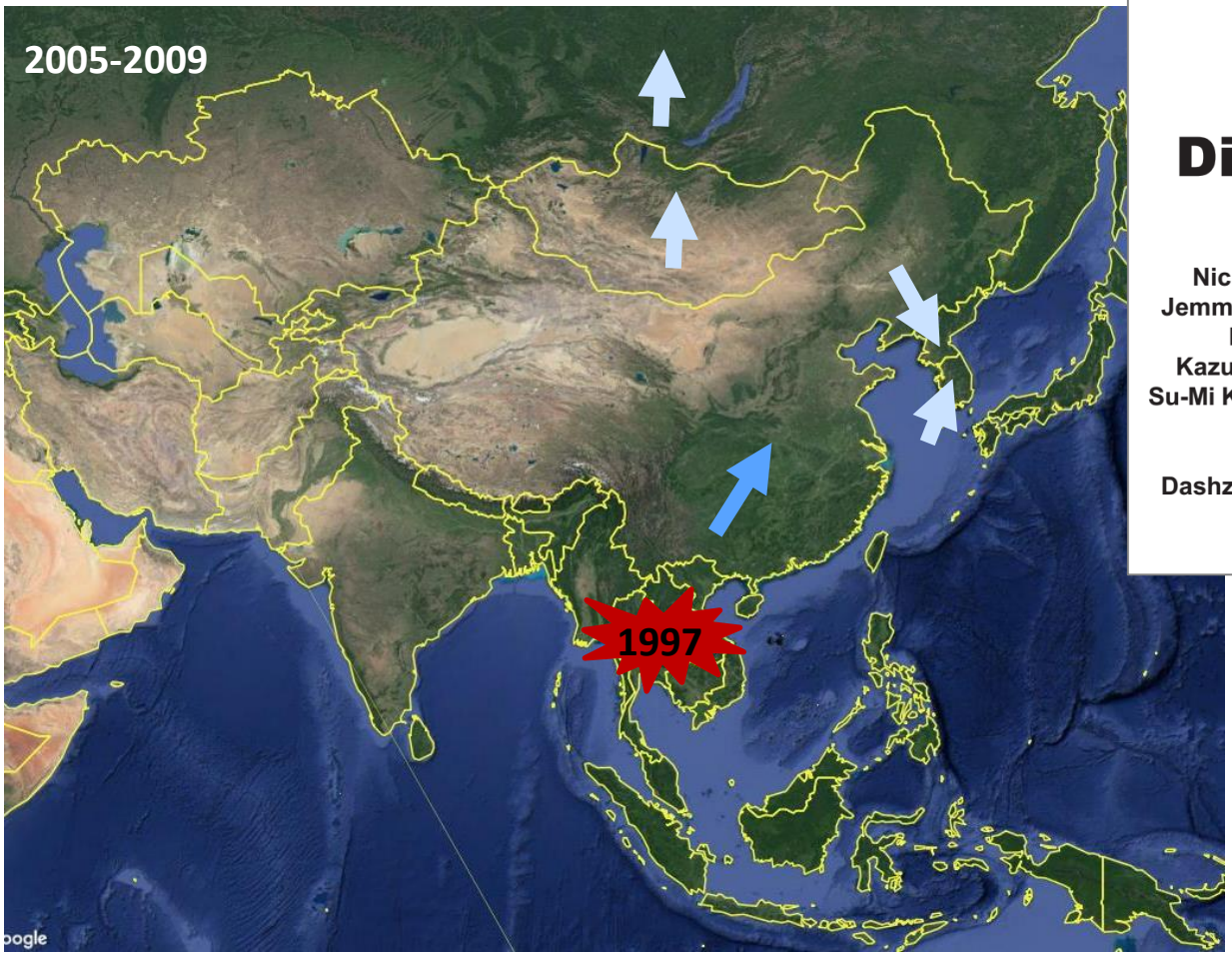
[1]Department of Comparative Medicine, Pig Research Institute, Taiwan, Chunan Miaoli.

A/Asia/SEA-97

A/Asia/SEA-97



A/Asia/SEA-97



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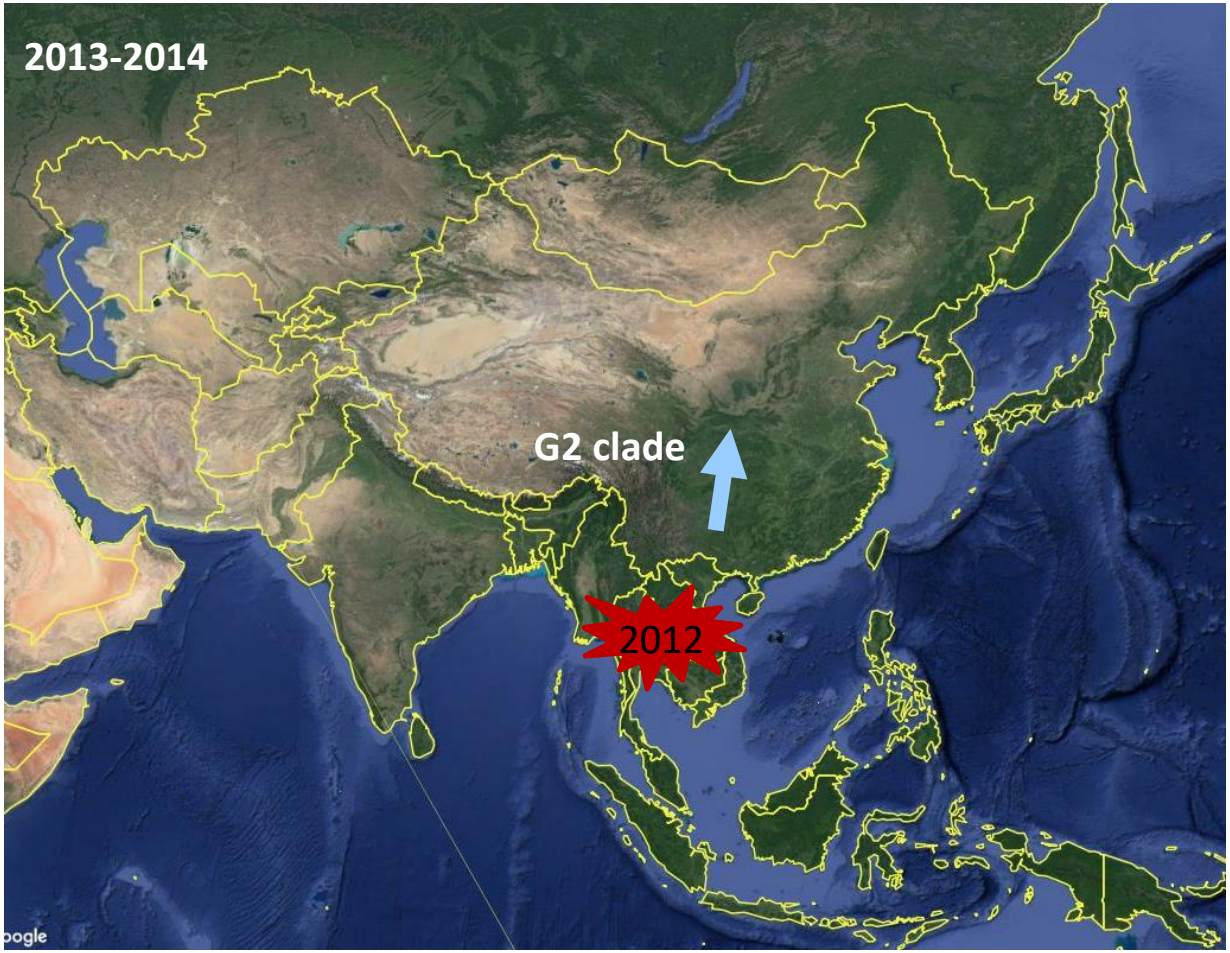
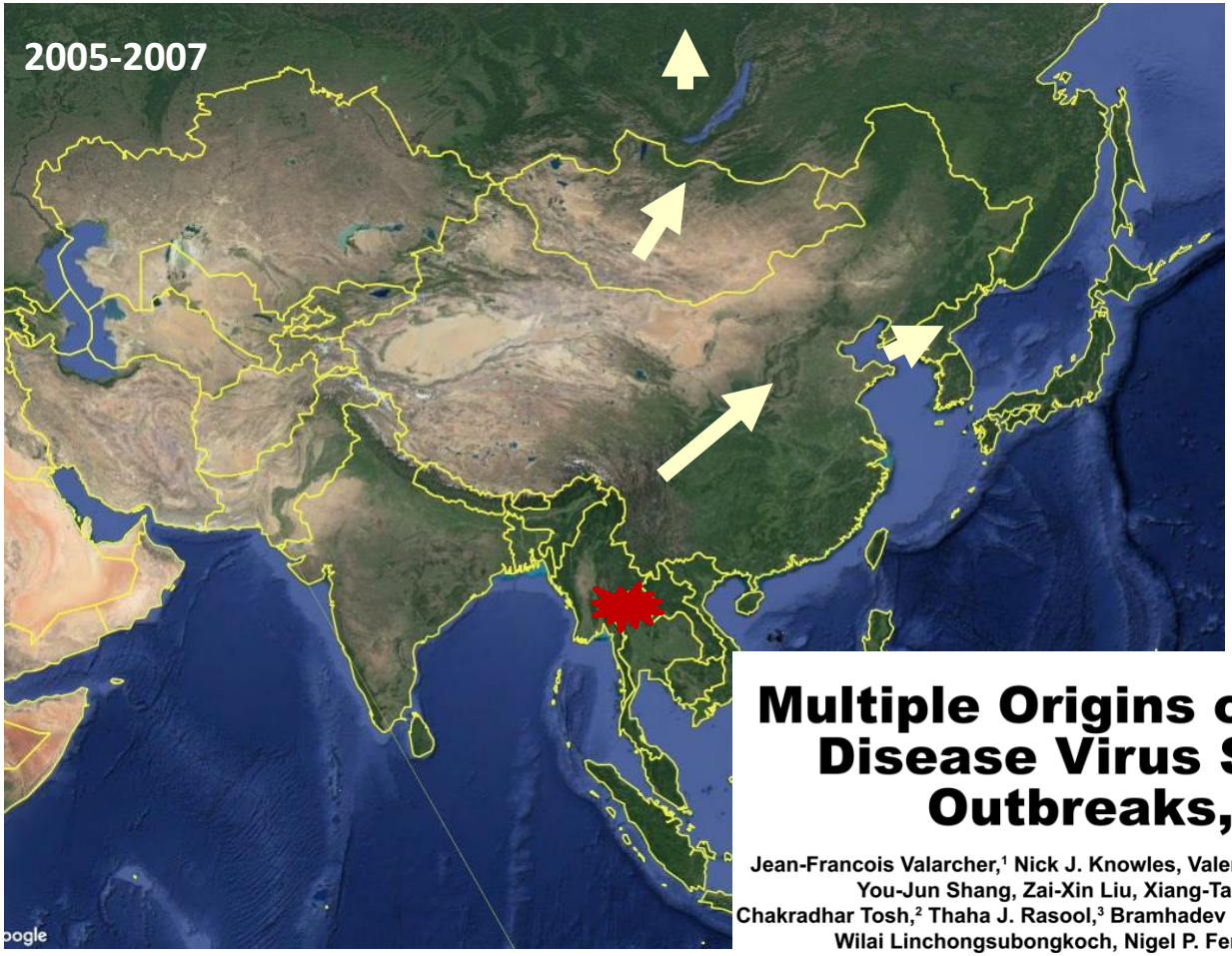
A/Asia/SEA-97



Serotype Asia 1



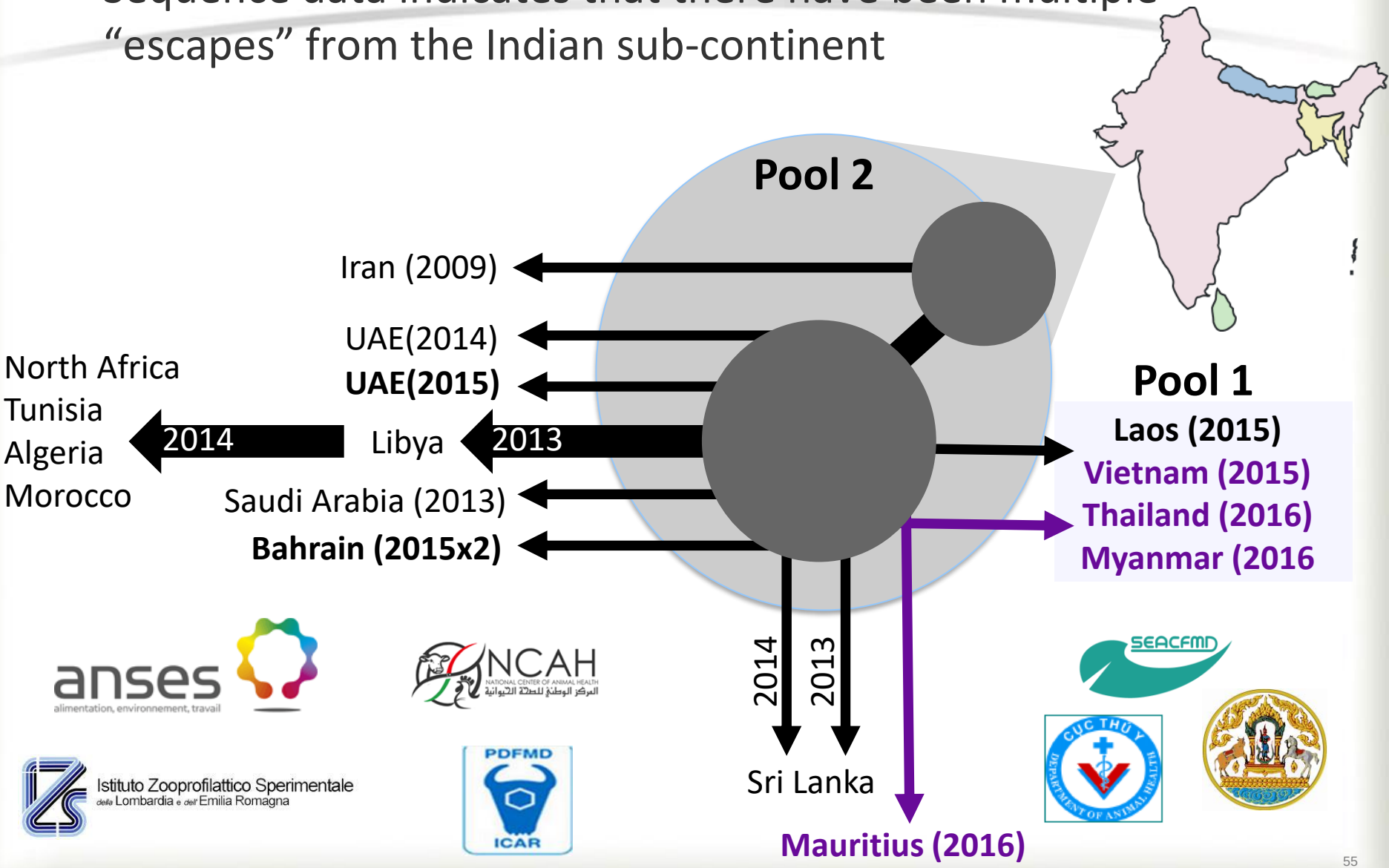
No outbreaks during 2011-2016

Multiple Origins of Foot-and-Mouth Disease Virus Serotype Asia 1 Outbreaks, 2003–2007

Jean-Francois Valarcher,[1] Nick J. Knowles, Valery Zakharov, Alexey Scherbakov, Zhidong Zhang, You-Jun Shang, Zai-Xin Liu, Xiang-Tao Liu, Aniket Sanyal, Divakar Hemadri, Chakradhar Tosh,[2] Thaha J. Rasool,[3] Bramhadev Pattnaik, Kate R. Schumann, Tammy R. Beckham,[4] Wilai Linchongsubongkoch, Nigel P. Ferris, Peter L. Roeder,[5] and David J. Paton

O/ME-SA/Ind-2001d: the new PanAsia?

- Sequence data indicates that there have been multiple "escapes" from the Indian sub-continent

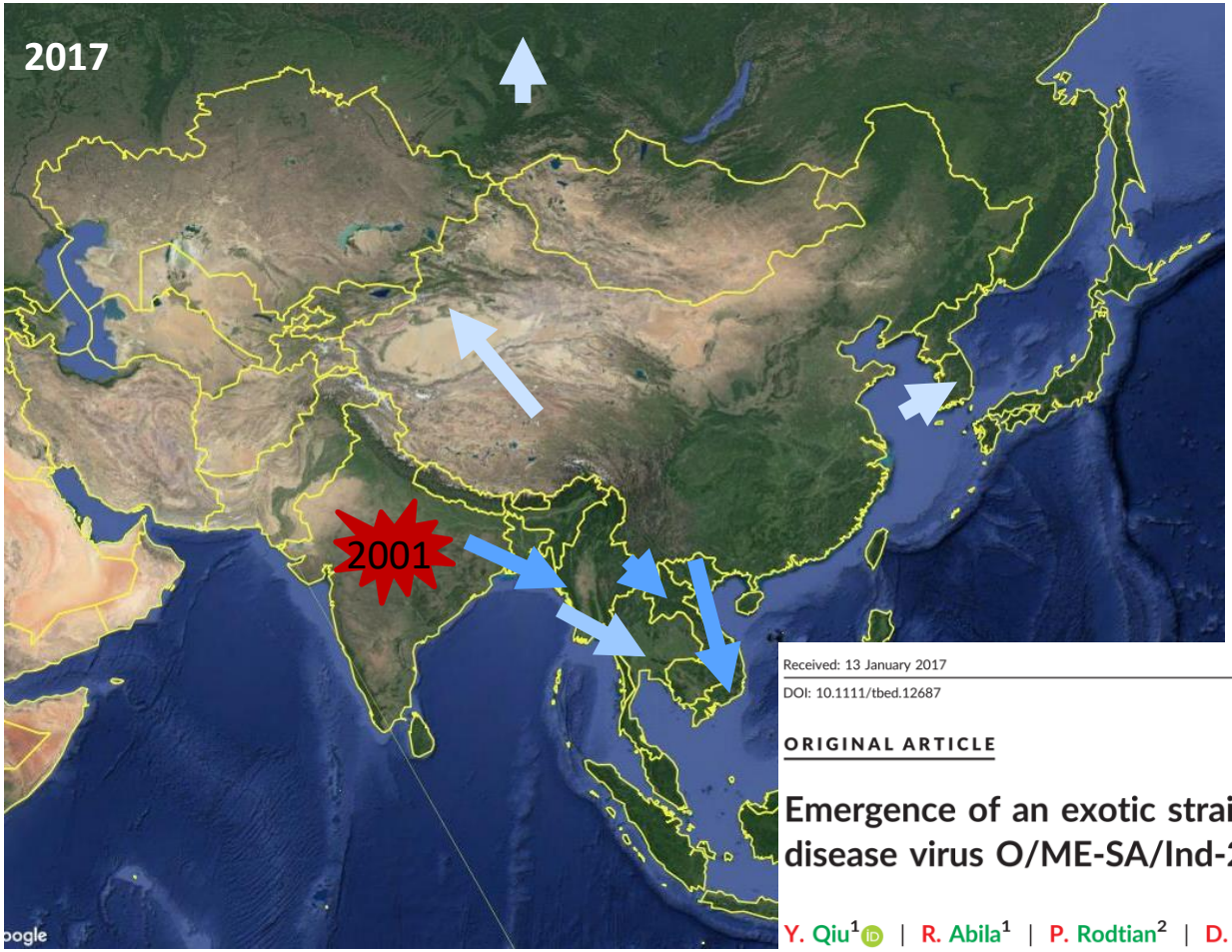


O/ME-SA/Ind2001

O/ME-SA/Ind2001

O/ME-SA/Ind2001

O/ME-SA/Ind2001



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ORIGINAL ARTICLE

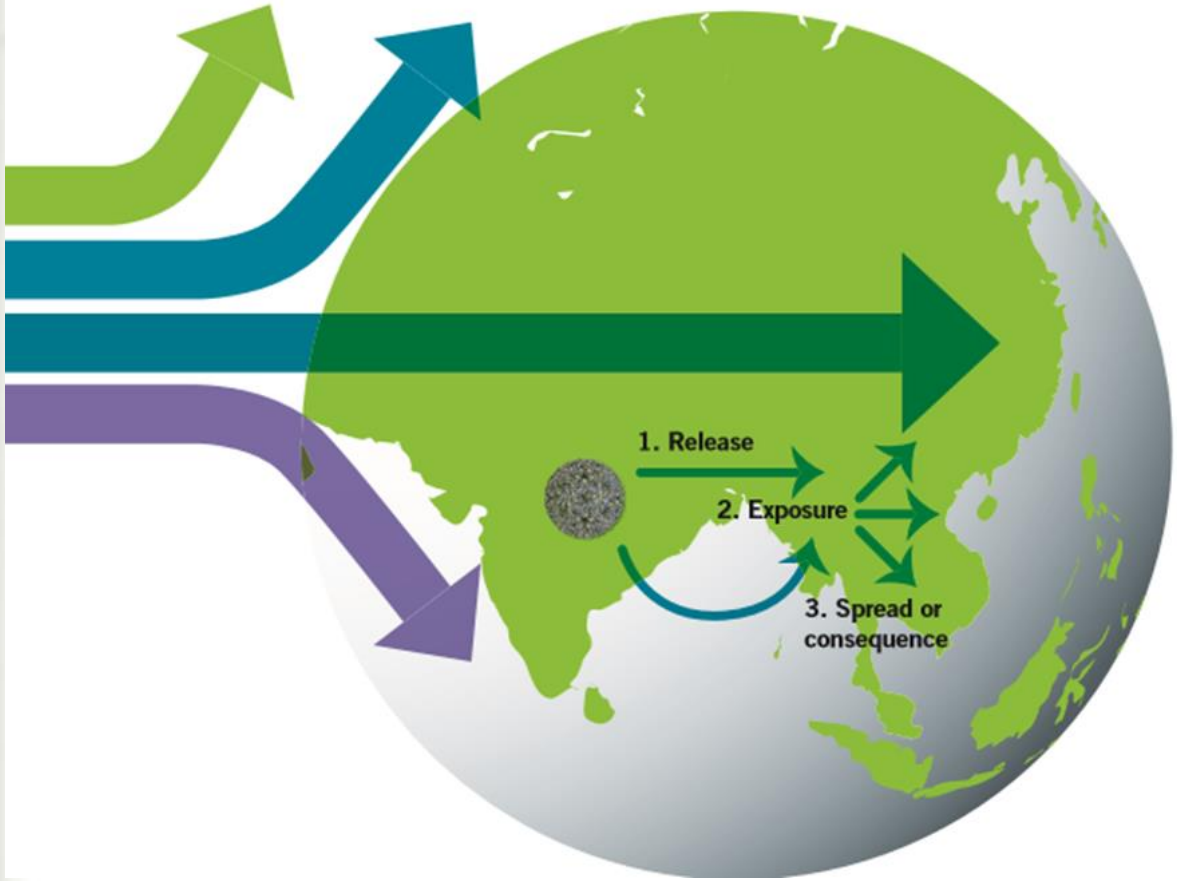
WILEY Transboundary and Emerging Diseases

Emergence of an exotic strain of serotype O foot-and-mouth disease virus O/ME-SA/Ind-2001d in South-East Asia in 2015

Y. Qiu[1] | R. Abila[1] | P. Rodtian[2] | D. P. King[3] | N. J. Knowles[3] | T. L. Ngo[4] | T. V. Le[4] | S. Khounsy[5] | P. Bounma[5] | S. Lwin[6] | B. C. Verin[1] | P. Widders[1]

PROOF

Risk analysis on incursion of exotic FMD viruses into Southeast Asia

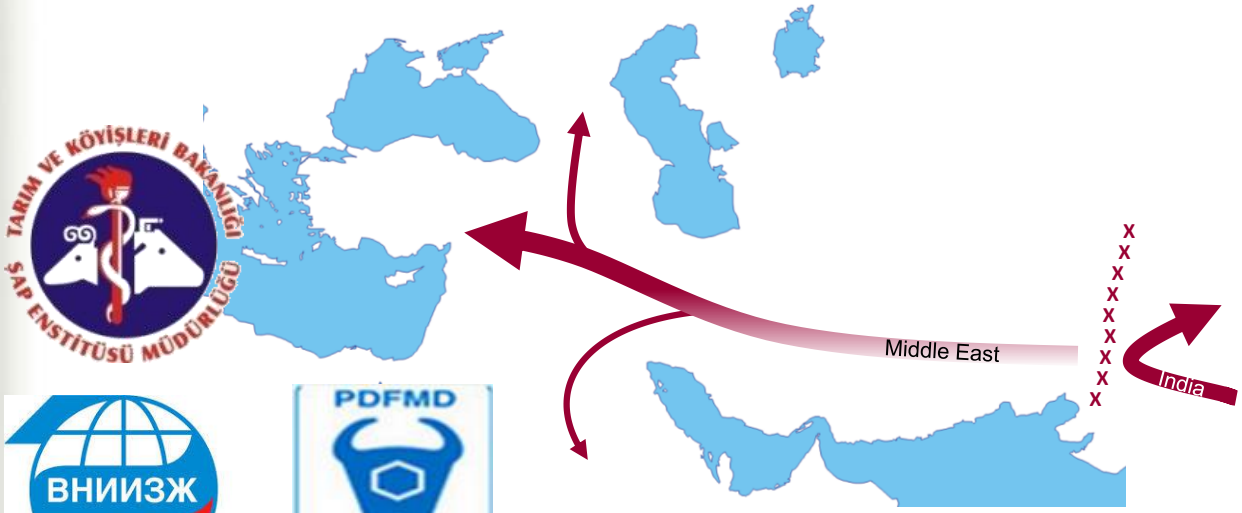


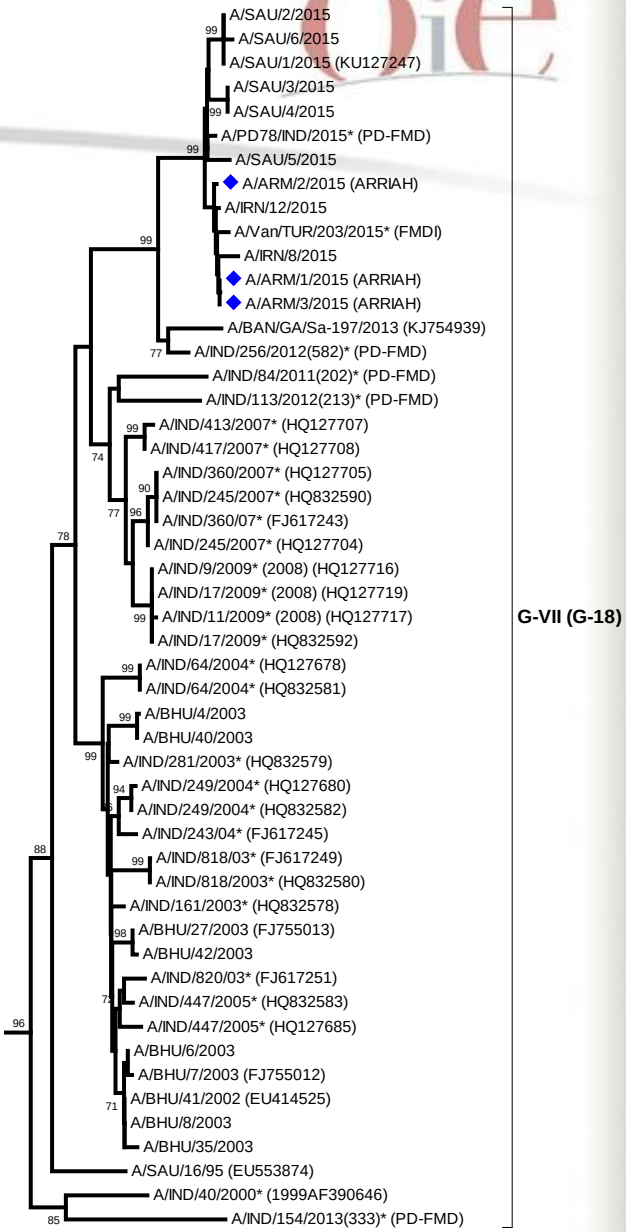
The risk of further incursions of exotic FMDVs into SEA is not a matter of "if" but rather of "when" !

Report available online: http://www.rr-asia.oie.int/fileadmin/FMDbook-v5.pdf

New serotype A outbreaks in West EurAsia (A/ASIA/G-VII)

- Initial reports September 2015
- Originating from the Indian sub-continent
- Pose the greatest risk to South East and East Asia





Seneca Valley Visrus (SVV)

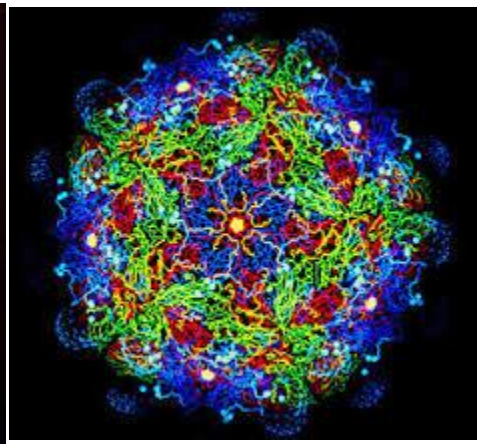
Seneca Valley Virus

- Seneca Valley virus (SVV) is a small, non-enveloped picornavirus
- discovered incidentally in 2002 as a cell culture contaminant
- First SVV-positive case in pigs was reported in Manitoba, Canada in 2007 and 2010 in the United States
- From 2015 to 2016 SVV infection in pigs was reported in more regions in Brazil, the United States, China, Canada, Colombia, and Thailand .

SVV and FMD

SVV

FMD



Thank you for your attention!

WORLD ORGANISATION FOR ANIMAL HEALTH

Protecting animals, preserving our future