



OIE/FAO
Foot-and-Mouth Disease
Reference Laboratories
Network



FMD in Southeast Asia: Update of WRLFMD activities - 2020

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FMD Reference Laboratory

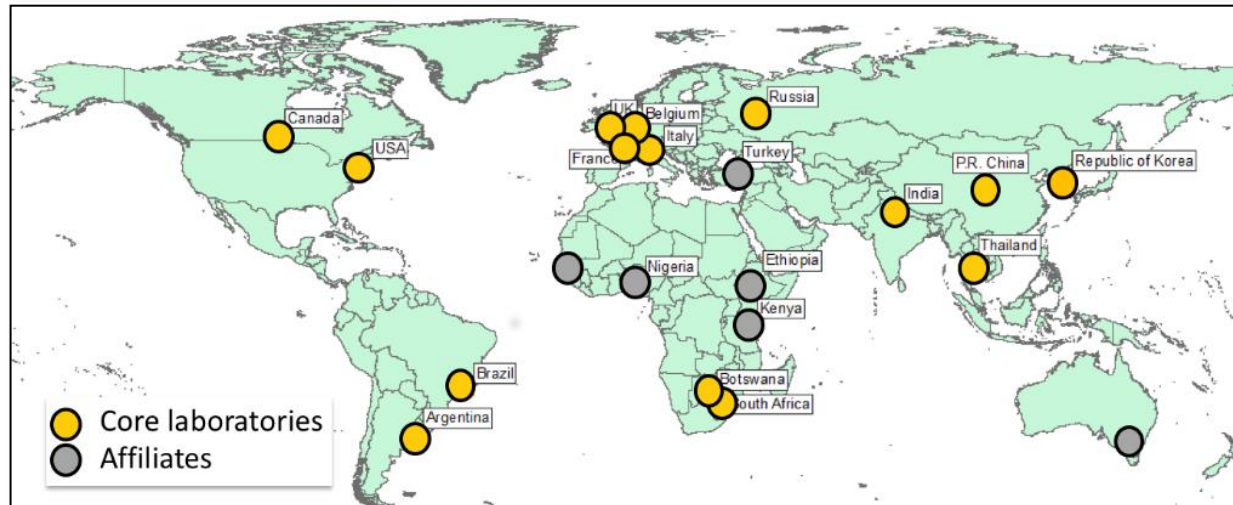


Annual Meeting of OIE/FAO FMD Laboratory Network: Data exchange/collation and review of patterns of FMD risks

Busan,
Republic of
Korea –
December
2019



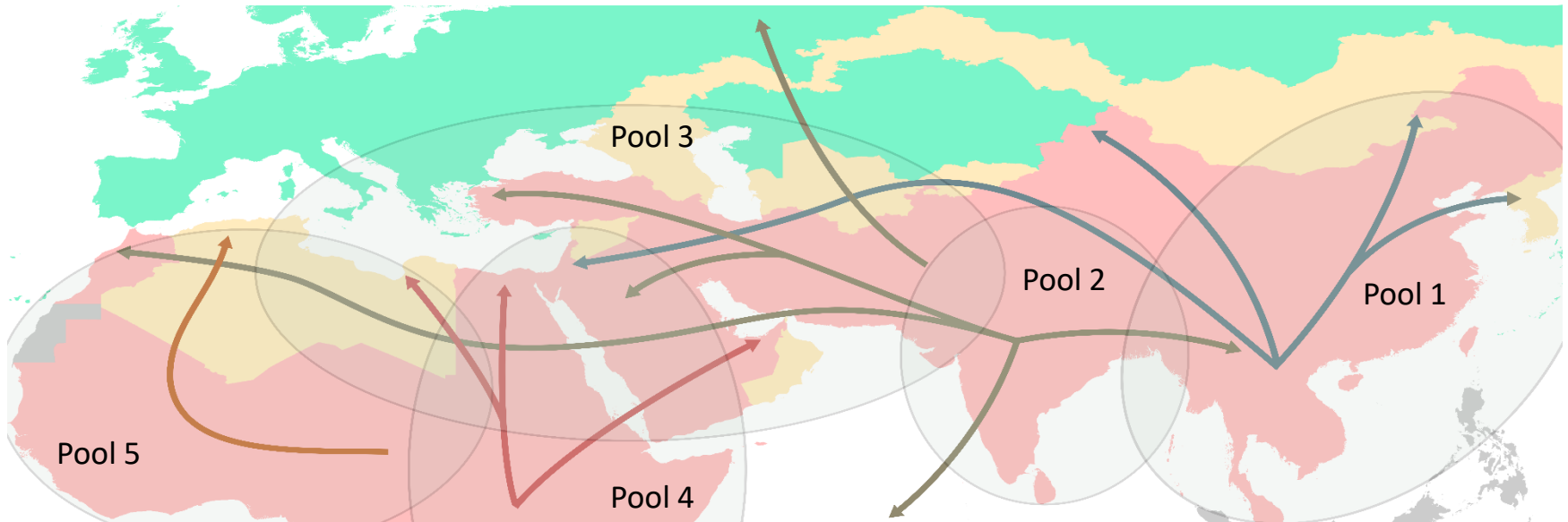
Core
Network
Members
and
affiliates:



Role of OIE/FAO FMD Reference Laboratory Network



- Serves as the “eyes and ears”
- Recognition and tracking of new and emerging viral lineages
- Early-warning and contingency planning
- Lab capacity/test harmonization



Recent long-distance “trans-pool” FMD virus movements

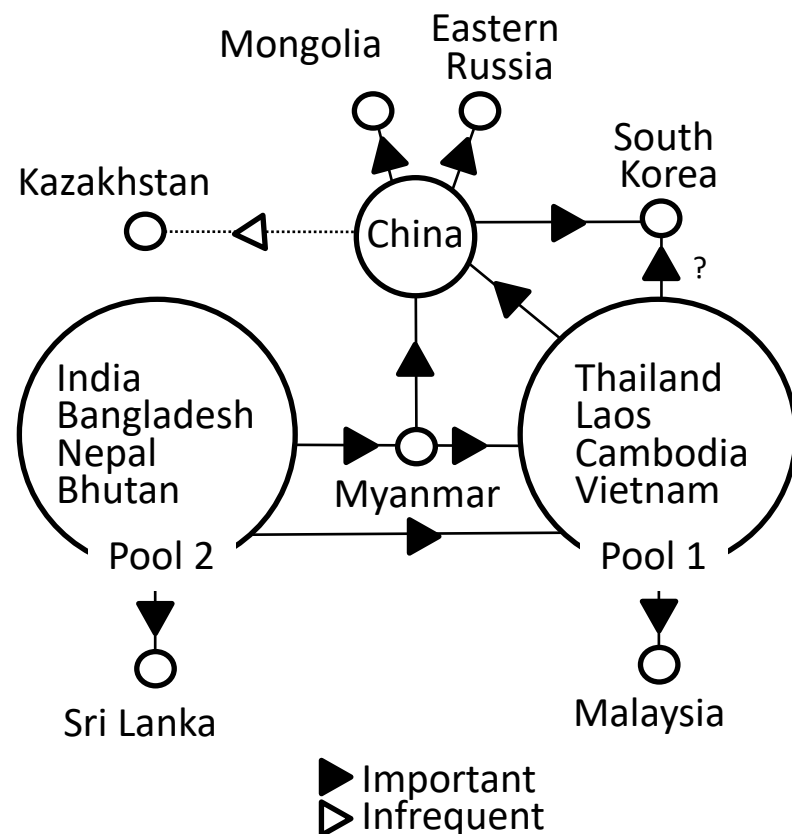
Conjectured FMDV connections within South Asia, Southeast Asia and East Asia

- Viral sequences highlight most frequent connections between countries (reflect trade and animal movements), including:

1. Spread of O/ME-SA/Ind-2001 and Asia 1 into Southeast Asia

2. Spread of four FMD virus lineages from mainland Southeast Asia:

- **O/ME-SA/PanAsia** China, Russia, Mongolia, Kazakhstan
- **O/SEA/Mya-98** China, Japan, South Korea, North Korea, Russia, Mongolia, Taipei
- **O/CATHAY** China, Hong Kong, Taipei
- **A/ASIA/Sea-97** China, Mongolia, Russia, Kazakhstan, Taiwan, South Korea (2017)



Pool 1: Status in 2020

Characterisation of different FMD virus lineages



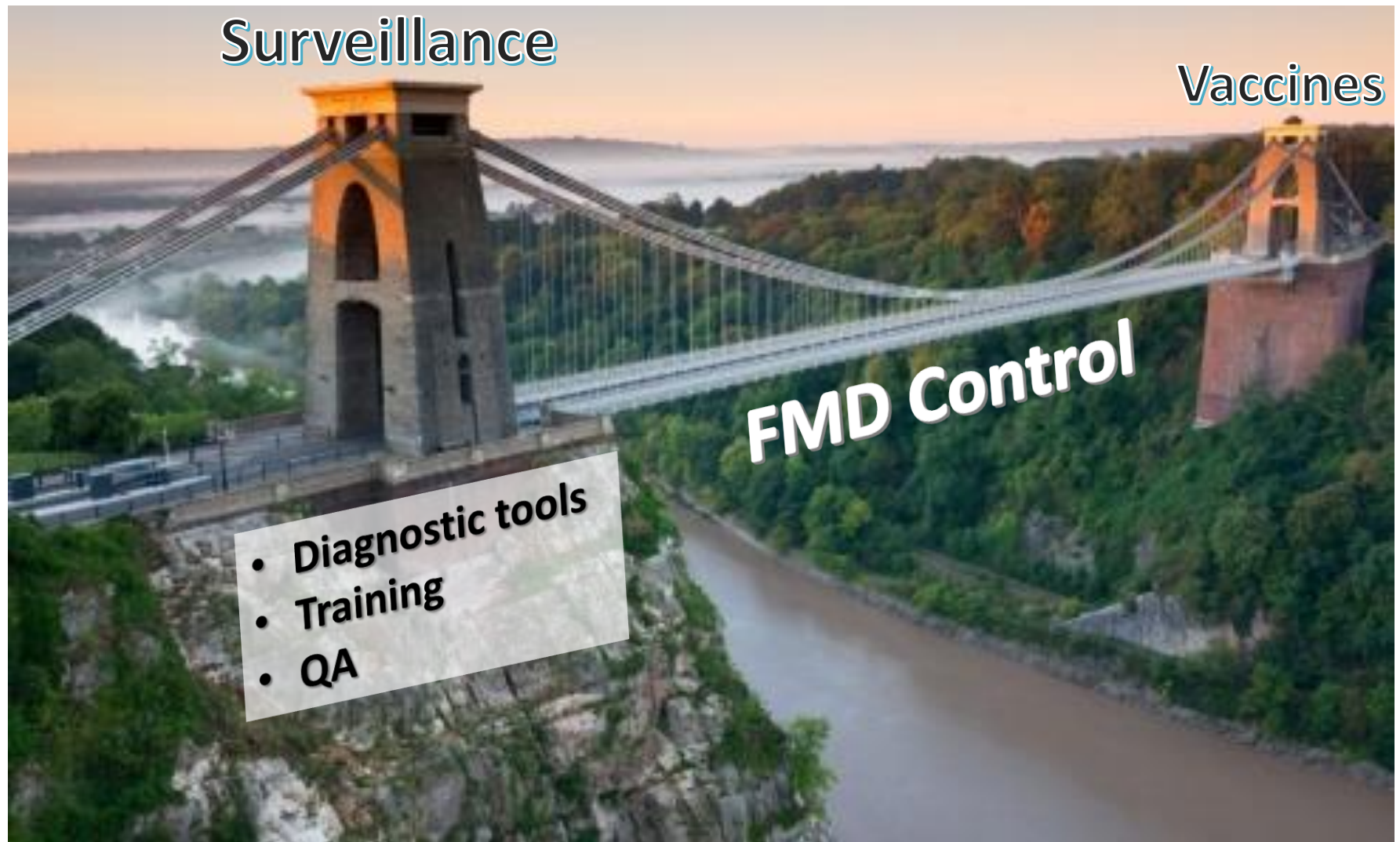
Based on data from WRLFMD, RRLSEA and the OIE/FAO Lab Network

Country (date of last shipment to WRLFMD)	O					A		Asia-1
	ME- SA/Ind- 2001	SEA / Mya-98	CATHAY	ME-SA / PanAsia	ME-SA/ PanAsia-2	ASIA / Sea-97	ASIA/Ind	
Cambodia (2017)		2016		2016		2016		
Laos (2018)	2015	2017		2018		2018		
Malaysia (2018)	2018	2016	2005		2009	2014		
Myanmar (2019)	2019	2019				2019	2010	2017
Thailand (2019)	2020	2018	2012	2019		2019		
Vietnam (2020)	2019	2019	2018	2018		2017		2006
PR China (2020)	2019	2020	2019	2019		2019		2009

Is this the true picture of FMD in SEA?

..... or does under-sampling bias our understanding of the epidemiology of the disease?

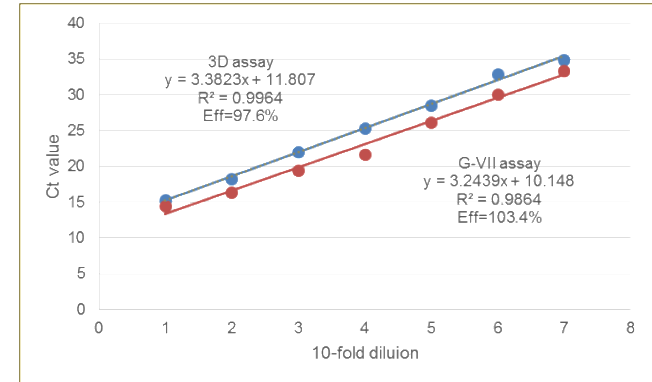
Laboratory activities: bridging gaps



Development of tailored lineage-specific real-time RT-PCR assays for FMDVs circulating In Asia

- New rRT-PCRs designed to detect:
 - A/ASIA/Sea-97,
 - O/ME-SA/Ind-2001,
 - O/ME-SA/PanAsia and PanAsia-2
 - O/SEA/Mya-98
 - O/CATHAY lineages
- Single protocol used for all assays – identical to pan-serotype rRT-PCR
- Validated with recent samples sent to WRLFMD from SEA, Pool 2 and Pool 3
- Represent a comprehensive panel of assays (**molecular toolbox**) for rapid characterisation of the FMDV lineages circulating in Asia at relatively low cost

Saduakassova et al. (2018) JVM
Saduakassova et al., EuFMD OS-18



Analytical sensitivity comparison to 3D rRT-PCR



Mika Saduakassova and Kasia Bankowska

Proficiency test scheme (Phase XXXII)

- New PTS for Q1-2020
- Designed for endemic countries and international Laboratories
- Complements PTS run by EU-RL (for FMD-free countries)
- Common samples/panels to evaluate diagnostic capacity at different levels
 - Basic capability: NSP serology and Ag-ELISA/rRT-PCR?
 - Advanced capacity: genome sequencing, vaccine matching?

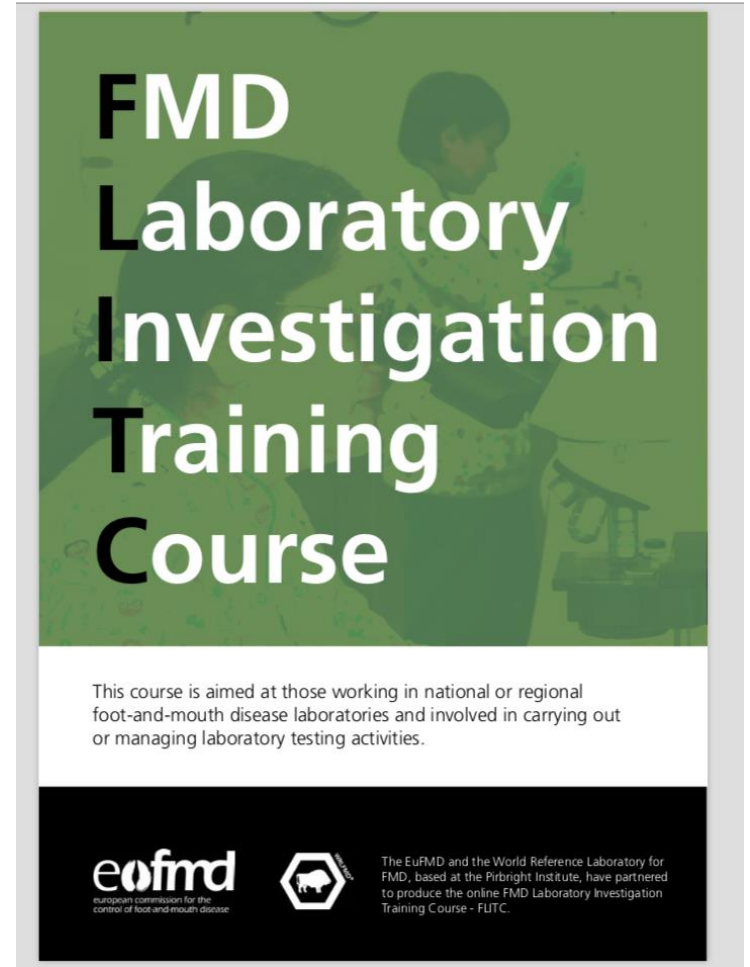
Level	VIROLOGY (Panel 1)		SEROLOGY (Panel 2)	
	Minimum test requirements	Expected lab capability	Minimum test requirements	Expected lab capability
PCP 0	-	n/a	NSP ELISA	Define infection history (FMDV+/-)
PCP 1	either AgELISA or RT-PCR	<ul style="list-style-type: none"> • FMD virus present • FMDV serotype 	NSP ELISA	Define infection history (FMDV+/-)
PCP 2	either AgELISA or RT-PCR	<ul style="list-style-type: none"> • FMD virus present • FMDV serotype 	NSP ELISA SP ELISA	<ul style="list-style-type: none"> • Define infectious status • vaccination status • serotype • +/- PVM
PCP 3 PCP 4+	AgELISA rRT-PCR +/- sequencing +/- VI*	<ul style="list-style-type: none"> • FMD virus present • FMDV serotype • topotype, lineage 	NSP ELISA SP ELISA +/- VNT*	<ul style="list-style-type: none"> • Define infectious status • vaccination status • serotype • +/- PVM
OIE/FAO Reference Laboratories	Enhanced genome sequencing*	<ul style="list-style-type: none"> • FMD virus present • FMDV serotype • topotype, lineage, and relationship between FMDV positive samples in panel 	NSP ELISA SP ELISA +/- VNT*	<ul style="list-style-type: none"> • Define infectious status • vaccination status • serotype • PVM • identify cross-reactivity

* If able to receive the infectious panel

E-learning courses

FMD diagnostics

- Last run in Feb/Mar 2019
- 200 registered participants - 124 completed course
- Course covers:
 - sample collection,
 - diagnostic methods,
 - QA
 - laboratory biosafety
- **Training course to be run again in Autumn 2020**
- Registration details to follow



Acknowledgements

- Support for the WRLFMD and research projects
- Collaborating FMD Reference Laboratories and field teams
- Partners within the OIE/FAO FMD Lab Network



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