Food and Agriculture Organization of the United Nations

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European Commission for the Control of Foot-and-Mouth disease

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

FMD 2024 JUL AUG SEP Quarterly Report

2024 Foot-and-mouth disease quarterly report
July-August-September

European Commission for the Control of Foot-and-Mouth Disease

2023-2027 Strategy
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Jammu and Kashmir: *Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties.*

Sudan and South Sudan: *Final boundary between the Republic of Sudan and the Republic of South Sudan has not yet been determined.*

Abyei: *Final status of the Abyei area is not yet determined.*

Falkland Islands (Malvinas): *A dispute exists between the Governments of Argentina and the United Kingdom of Great Britain and Northern Ireland concerning sovereignty over the Falkland Islands (Malvinas).*

Contents

Abbreviations and acronyms

BVI	Botswana Vaccine Institute
EIDRA	Emerging Infectious Disease Research Association
EuFMD	European Commission for the Control of Foot-and-Mouth Disease
FAST reports	foot-and-mouth and similar transboundary animal diseases reports
FGBI “ARRIAH”	Federal Governmental Budgetary Institution “Federal Centre for Animal Health”
FMD	foot-and-mouth disease
FMDV	foot-and-mouth disease virus
FMDV GD	foot-and-mouth disease virus genome detected
FMDV NGD	foot-and-mouth disease virus genome not detected
GF-TAD	Global Framework for the Progressive Control of Transboundary Animal Diseases
LVRI	Lanzhou Veterinary Research Institute
MEVAC	International Facility for Veterinary Vaccines Production (Egypt)
MNFMDL	Malaysian National Foot-and-Mouth Disease Laboratory
NT	not tested
NVD	no virus detected
PIADC	Plum Island Animal Disease Center
Pusvetma	Pusat Veteriner Farma (Indonesia)
rRT-PCR	real-time reverse transcription polymerase chain reaction
SAARC	South Asian Association for Regional Cooperation
SADC	Southern African Development Community
SAT	Southern African Territories
SEACFMD	South-East Asia and China FMD campaign
SSARRL	Sub-Saharan Africa Regional Reference Laboratory
SVD	swine vesicular disease
VETBIS	Veterinary Information System of Türkiye
VI	virus isolation
WAHIS	World Animal Health Information System (of the WOAH)
WOAH	World Organisation for Animal Health
WRLFMD	World Reference Laboratory for Foot-and-Mouth Disease

1. Highlights and headlines

A warm welcome to this quarterly report that summarises the latest information from the WRLFMD (www.wrlfmd.org) and our partners within the WOAH/FAO FMD Laboratory Network (www.foot-and-mouth.org). During this period, the WRLFMD has reported test results for samples received from Ethiopia, Indonesia, Nepal and Uganda. There has also been a new sequence submission from Türkiye (Şap Enstitüsü, Türkiye), which highlights the detection of serotype A (A/ASIA/Iran-05^{FAR-11}) representing the first cases due to this serotype in the country for six years. FMD outbreaks due to the emerging SAT2/XIV lineage continue to be reported in Türkiye as well as in Iraq, but no new locations appear to be affected. Sequence data demonstrates that viruses frequently move from East Africa (Pool 4) to Western Asia (Pool 3). As an example, new full genome sequences generated for SAT2/XIV samples collected in Ethiopia, have allowed us to assign distinct sub-clades for viruses previously charactered from Oman (2 clades), Bahrain, Jordan and Iraq/Türkiye, providing evidence for multiple introductions of this lineage into the Middle East. The recent spread of this topotype from East Africa has been paralleled by the detection of other viruses with an East African origin in the Gulf States (A/AFRICA/G-I in Bahrain [2021]; O/EA-3 in Bahrain [2021] and SAT1 in Qatar [2023]).

Elsewhere, in southern Africa, there have been further FMD outbreaks due to serotypes SAT 2 (Kwazulu-Natal and Eastern Cape provinces) and SAT 3 in South Africa (Free State Province), as well as new FMD cases reported in Mozambique (SAT 1) and Zimbabwe (untyped). The upsurge of FMD cases in Southern Africa raises risks for other countries, as has been shown by the detection of SAT3/1 in Mauritius with a sequence that is very closely related to contemporary sequences from South Africa.

Reconstructing these transboundary events is heavily reliant upon our networks to promptly exchange samples and share viral sequences. During September, I was pleased to catch up with the partners from the FMD Network at FAO HQ in Rome. New events described at this meeting include the detection of serotype A viruses in Bangladesh that originate from Pool 3 (by APQA, South Korea), as well as retrospective analyses undertaken by ANSES, France for samples collected during 2022 from Burkina Faso that represent the only recent West African examples of the SAT2/V topotype that was detected in Algeria. We welcome your feedback on a new web-based tool (OpenFMD: www.openfmd.org) which now available to the FMD scientific community to promote and simplify the sharing of FMD information.

Don King, Pirbright, October 2024

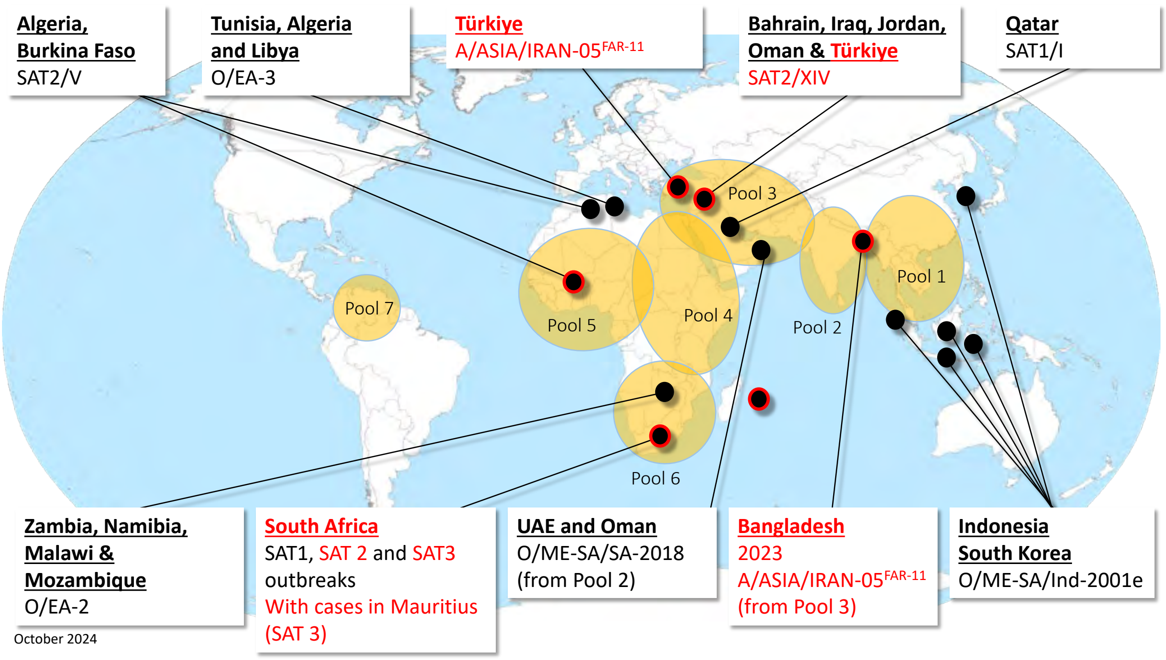


Figure 1: Recent FMD outbreaks with global epidemiological significance.

Note: New headline events reported July to September 2024 are highlighted in red with FMD endemic pools highlighted in orange. Source: WRLFMD. Map conforms to the United Nations World Map, June 2020.

2. General overview

Endemic Pools comprise separate ecosystems that maintain independently circulating and evolving foot-and-mouth disease virus (FMDV) genotypes. In the absence of specific reports, it should be assumed that the serotypes indicated below are continuously circulating in parts of these pools and would be detected if sufficient surveillance was in place.

POOL	REGION/COUNTRIES	SEROTYPES PRESENT
1	**SOUTHEAST ASIA/CENTRAL ASIA/EAST ASIA** Cambodia, China, China (Hong Kong SAR), Taiwan Province of China, Indonesia, Democratic People's Republic of Korea, Republic of Korea, Lao People's Democratic Republic, Malaysia, Mongolia, Myanmar, Russian Federation, Thailand, Viet Nam	A, Asia1 and O
2	**SOUTH ASIA** Bangladesh, Bhutan, India, (Mauritius[1]), Nepal, Sri Lanka	A, Asia1 and O
3	**WEST EURASIA & NEAR EAST** Afghanistan, Armenia, Azerbaijan, Bahrain, Georgia, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kazakhstan, Kuwait, Kyrgyzstan, Lebanon, Oman, Pakistan, Palestine, Qatar, Saudi Arabia, Syrian Arab Republic, Tajikistan, Türkiye, Turkmenistan, United Arab Emirates, Uzbekistan	A, Asia1 and O (SAT2)
4	**EASTERN AFRICA** Burundi, Comoros, Djibouti, Egypt[3], Eritrea, Ethiopia, Kenya, Rwanda, Somalia, South Sudan, Sudan, Uganda, United Republic of Tanzania, Yemen	O, A, SAT1, SAT2 and SAT3
	NORTH AFRICA[2] Algeria, Libya, Morocco, Tunisia	A and O
5	**WEST/CENTRAL AFRICA** Benin, Burkina Faso, Cabo Verde, Cameroon, Central African Republic, Chad, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Sao Tome and Principe, Senegal, Sierra Leone, Togo	O, A, SAT1 and SAT2
6	**SOUTHERN AFRICA** Angola, Botswana, Malawi, Mozambique, (Mauritius[1]), Namibia, South Africa, Zambia, Zimbabwe	SAT1, SAT2 and SAT3 (O[4], A)
7	**SOUTH AMERICA** Venezuela (Bolivarian Republic of)	O and A

[1]FMD outbreaks in 2016/21 due to O/ME-SA/Ind-2001 demonstrate close epidemiological links between Pool 2 and Mauritius, while cases due to serotype SAT 3 (reported in 2024) highlight the connectivity to Pool 6.

[2]Long-term maintenance of FMDV lineages has not been documented in the Maghreb countries of North Africa and therefore this region does not constitute an Endemic Pool, but data is segregated here since FMD circulation in this region poses a specific risk to FMD-free countries in Southern Europe.

[3]Egypt represents a crossroads between East African Pool 4 and the Near East (Pool 3). NB: Serotypes SAT1 and SAT3 have not been detected in this country.

[4]Detection of O/EA-2 in southern/western Zambia (2018–2021), Namibia (2021), Malawi (2022) and Mozambique (2022) represent a new incursion into Pool 6.

3. Summary of FMD outbreaks and intelligence

3.1. Overview of reports

The location of information provided in this report can be seen on the map below. More detailed maps and sample data, on a country-by-country basis, can be found in the following sections of this report.

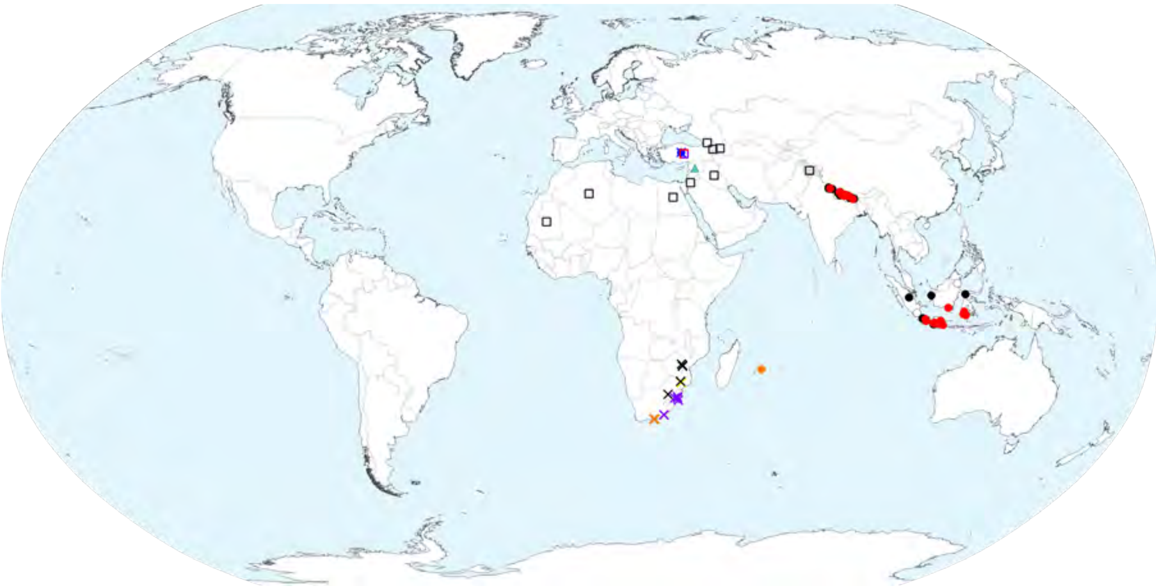
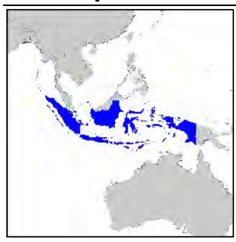


Figure 2: Samples tested by WRLFMD or reported in this quarter. ● indicates samples analysed; × indicates outbreaks reported/updated to the WOAH this quarter; □ indicates reports of FMD from other sources. Shape colours define the serotype detected ●O; ●A; ●C; ●Asia1, ●SAT1, ●SAT2, ●SAT3, ● serotype undetermined/not given in the report, ○ FMD not detected.

Source: WRLFMD. Map conforms to the United Nations World map, June 2020.

3.2. Pool 1 (Southeast Asia/Central Asia/East Asia)

The Republic of Indonesia



On 2 September 2024, a batch of 40 samples was received to the WRLFMD. The samples had been collected from various locations across Indonesia between July 2022 and May 2024. The results for these samples were **FMD type O** (n=16) and FMDV-GD (genome detected) (n=16), while the remaining samples had no detectable virus. Sequencing subsequently revealed that 4 of these 16 samples orginally classified as FMDV-GD were FMD type O. Sequencing characterized all the type O viruses as belonging to the O/ME-SA/Ind-2001e topotype (see below).

3.3. Pool 2 (South Asia)

Nepal

On 4 July 2024, a batch of 40 samples was received to the WRLFMD. They were identified as **FMD type O** (n=18) and FMDV-GD (genome detected) (n=22) while the remaining samples had no detectable virus. Sequencing subsequently revealed that 7 of the 22 samples orginally classified as FMDV-GD were FMD type O. Sequencing characterized the type O viruses as O/ME-SA/Ind-2001e topotype (n=21) and O/ME-SA/SA-2018 topotype (n=4) (see below).

The Republic of India

In early July the Animal Husbandry Department in Kargil reported a significant outbreak of a FMD, affecting cattle in the highland pastures of Matayan, Pandarss, Minamarag, Omachikthang.

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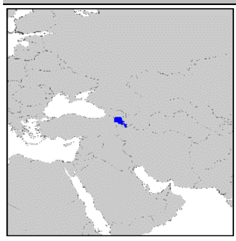
3.4. Pool 3 (West Eurasia and Near East)

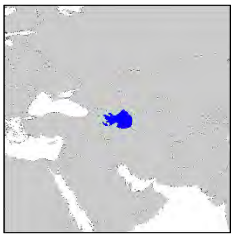
Armenia



The 2024 seromonitoring survey was started following the spring vaccination campaign with the collection of 4,400 samples. Passive and active surveillance for FMD is also in place in Armenia. Over 210,000 large ruminants and 95,000 small ruminants have been vaccinated this quarter.

EuFMD FAST Report

The Republic of Azerbaijan



During July to September, >1.5 million cattle and 1.1 million small ruminants were vaccinated. Active and passive surveillance is in place to monitor for outbreaks of FMD.

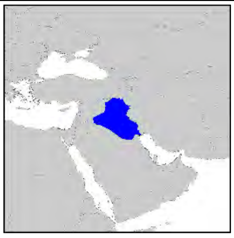
EuFMD FAST Report

Georgia

A surveillance plan for FMD has been devised and is being implemented. Over 180,000 large ruminants and 695,000 small ruminants have been vaccinated against FMD this quarter.

EuFMD FAST Report

The Republic of Iraq



An outbreak in the Garmain region of Kurdistan was reported this quarter (4 confirmed and 650 suspected cases). A surveillance plan has been devised to control disease in the country and passive surveillance is currently active in the Kurdistan region. A vaccination campaign started in August (before July for Kurdistan) using a vaccine containing O, A, Asia-1 and SAT 2 serotypes.

EuFMD FAST Report

The Hashemite Kingdom of Jordan

Passive surveillance and a pilot initiative for syndromic surveillance for FMD is occurring. A vaccination campaign is in progress, with over 3,000 large ruminants and more than 7,500 small ruminants vaccinated this quarter.

EuFMD FAST Report

Syrian Arab Republic

Surveillance for FMD, including active surveillance, inspections at post-mortems and monitoring, is being conducted in the country. Over 120,00 cattle and 65,000 sheep have been vaccinated

EuFMD FAST Report

Türkiye

In this quarter, 8 outbreaks (in Anatolia) have been reported. Seven due to serotype SAT 2 and one serotype A. The phylogenetic analysis for the serotype A sequence (A/ASIA/Iran-05^{FAR-11}) is described in this report (see below).

The Autumn vaccination campaign started in September and will run until mid-November using the same vaccine used in the spring campaign (O, A, Asia-1 and SAT 2). Risk based surveillance continues in the Thrace region and clinical surveillance which monitors for FMD outbreaks is on-going in the buffer zone along the Southeastern and Eastern borders of Anatolia. A new animal movement checkpoint (to monitor animal movements and compliance with regulations) has been established near Ankara.

EuFMD FAST Report

3.5. Pool 4 (North and Eastern Africa)

The People's Democratic Republic of Algeria

There is an ongoing FMD vaccination campaign.

EuFMD FAST Report

The Islamic Republic of Mauritania

During September, 4 outbreaks were reported from the Eastern region of the country. There is passive surveillance for FMD in the country.

EuFMD FAST Report

The Arab Republic of Egypt

Extensive clinical surveillance has been undertaken in villages and animal markets (examining >250,000 animals). More than 3 million animals have been vaccinated during the current vaccination program.

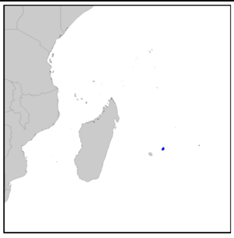
EuFMD FAST Report

3.6. Pool 5 (West/Central Africa)

No new outbreaks of FMD were reported in West or Central Africa.

3.7. Pool 6 (Southern Africa)

Republic of Mauritius



Samples were sent to ANSES, France, for testing of suspected cases of FMD that were observed at a quarantine facility. Sequencing detected a SAT 3/I virus most closely related to viruses collected in Southern Africa (Pool 6). (see below)

3.8. Pool 7 (South America)

No new outbreaks of FMD were reported in South America.

3.9. Extent of global surveillance

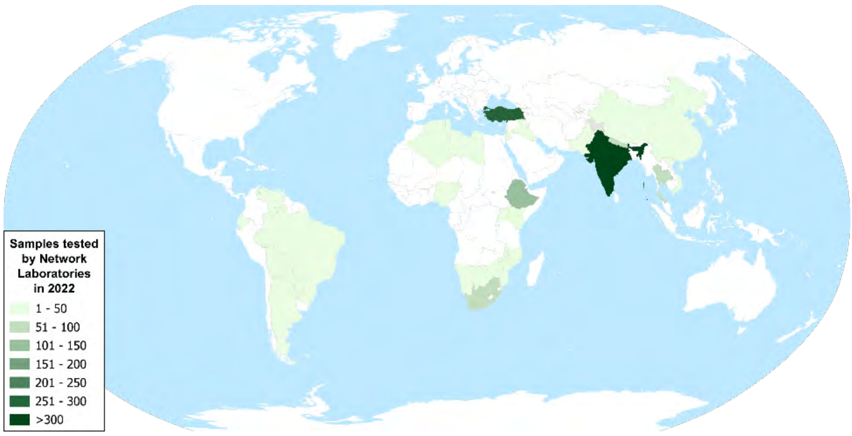


Figure 3: Samples received during 2023 from FMD outbreaks (routine surveillance that is undertaken in countries that are FMD-free without vaccination is not shown). Data (updated where appropriate) from

presentations given at the WOAH/FAO FMD reference laboratory network annual meeting (https://www.foot-and-mouth.org/Ref-Lab-Network/Network-Annual-Meeting).
Source: WRLFMD. Map conforms to the United Nations World map, June 2020.

In regions where FMD is endemic, continuous evolution of the virus generates geographically discrete lineages that are genetically distinct from FMD viruses found elsewhere. This report displays how different FMD lineages circulate in different regions; these analyses accommodate the latest epidemiological intelligence to assess the relative importance of the viral strains circulating within each region (see Table 1, below).

Table 1: Conjectured relative prevalence of circulating FMD viral lineages in each Pool (last updated October 2023). These scores can be used to inform the PRAGMATIST tool (see Annex 3).

Lineage	Southeast/ Central / East Asia [Pool 1]	South Asia [Pool 2]	West Eurasia & Near East [Pool 3]	North Africa	Eastern Africa [Pool 4]	West / Central Africa [Pool 5]	Southern Africa [Pool 6]	South America [Pool 7]
O ME-SA PanAsia-2			**30**					
O ME-SA PanAsia	10							
O SEA Mya-98	**21.5**							
O ME-SA Ind2001	**40**	**76**[1]	**5.5**[1]	**0**				
O EA or O WA			**1.5**	**60**	**53.5**	**69**	16	
O EURO-SA								**90**
O CATHAY	10.5							
A ASIA Sea-97	**18**							
A ASIA Iran-05	0		**28**					
A ASIA G-VII		**20**	**5**					
A AFRICA				**30**	**17**	**15**		
A EURO-SA								**10**
Asia1	**0**	4	**10**					
SAT 1			**1**	0	**15**	**1**	**16**	
SAT 2			**19**	10	14	**15**	**52**	
SAT 3					**0.5**		16	
C								

[1] Includes cases due to the emerging O/ME-SA/SA-18 lineage that has been recently detected in Pools 2 and 3.

Note: For each of the regions, data represent the relative importance of each viral lineage (prevalence score estimated as a percentage [percent] of total FMD cases that occur in domesticated hosts). These scores are reviewed at the annual WOAH/FAO FMD reference laboratory network meeting. Changes to increase risks are shown in **red**, while a reduction in risk is shown in **green**. A further update will be provided in the next report using the data presented at the WOAH/FAO FMD Reference Laboratory Network meeting in September 2024.

A number of outbreaks have occurred where samples have not been sent to the WRLFMD or other laboratories in the WOAH/FAO FMD Laboratory Network. An up-to-date list and reports of FMD viruses characterised by sequencing can be found at the following website: http://www.wrlfmd.org/country-reports/country-reports-2024.

Results from samples or sequences received at WRLFMD (status of samples being tested) are shown in Table 2 and a complete list of clinical sample diagnostics made by the WRLFMD from

July - September 2024 is shown in Annex 1: (Summary of submissions). A record of all samples received by WRLFMD is shown in Annex 1: (Clinical samples).

Table 2: Status of sequencing of samples or sequences received by the WRLFMD from July - September 2024.

WRLFMD Batch No.	Date received	Country	Total No. samples	Serotype	No. of samples	No. of sequences	Sequencing status
WRLFMD/2024/000008	04/07/2024	Nepal	50	O	18	18	Finished
				FMDV GD	22	7*	
				NVD	10		
WRLFMD/2024/000009	02/09/2024	Indonesia	40	O	16	16	Finished
				FMDV GD	16	4 *	
				NVD	8		
Totals			**90**		**90**	**45**	

** Samples originally identified as FMDV GD were identified as FMD type O by sequencing.*

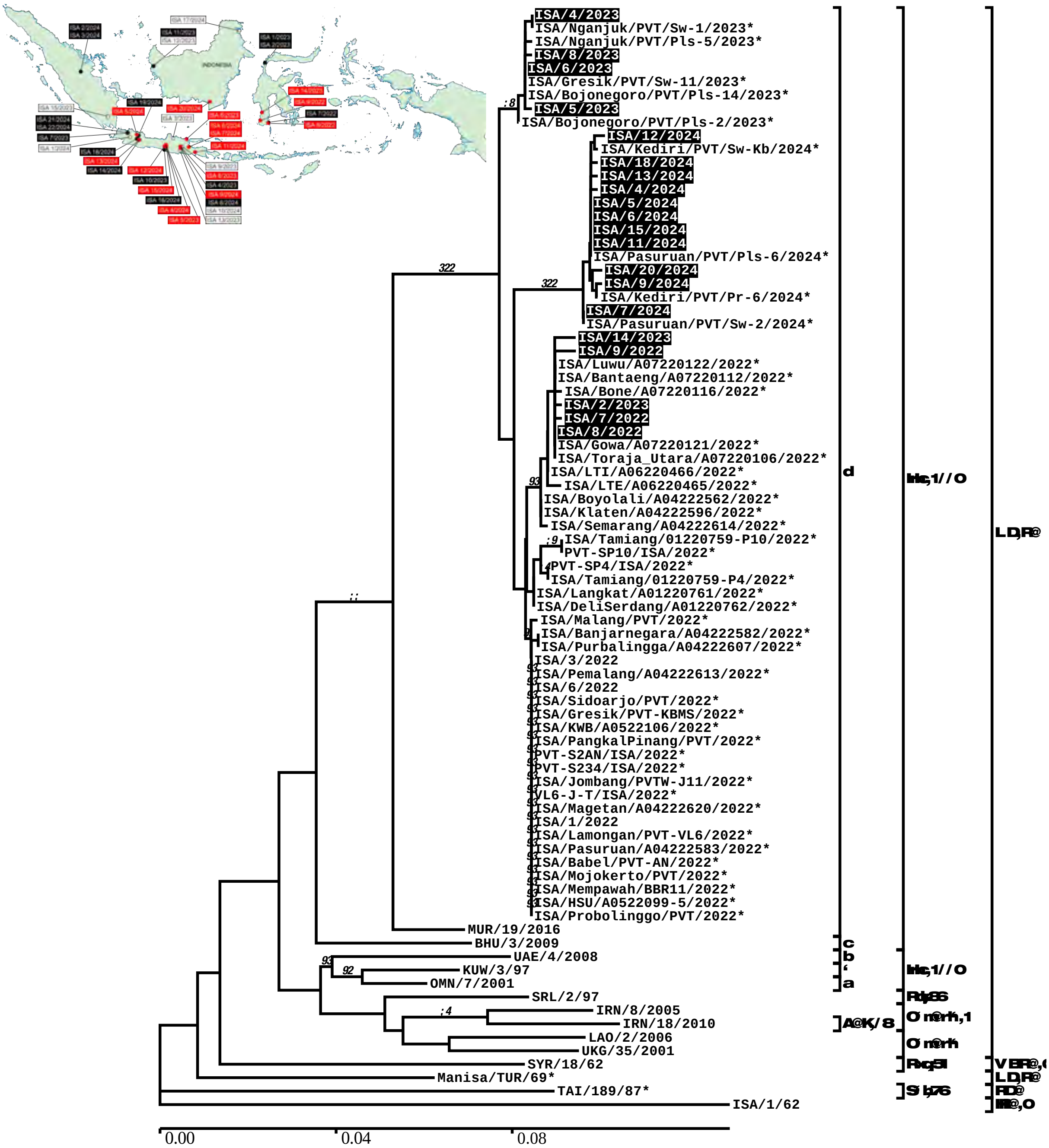
Table 3: VP1 sequences submitted by other FMD laboratories to the WRLFMD from July - September 2024.

WRLFMD Batch No.	Date received	Country	Serotype	Date Collected	No. of sequences	Submitting laboratory
WRLMEG/2024/000011	17/09/2024	Türkiye	A	2024	1	Şap Enstitüsü
				Total	**1**	

4. Detailed analysis

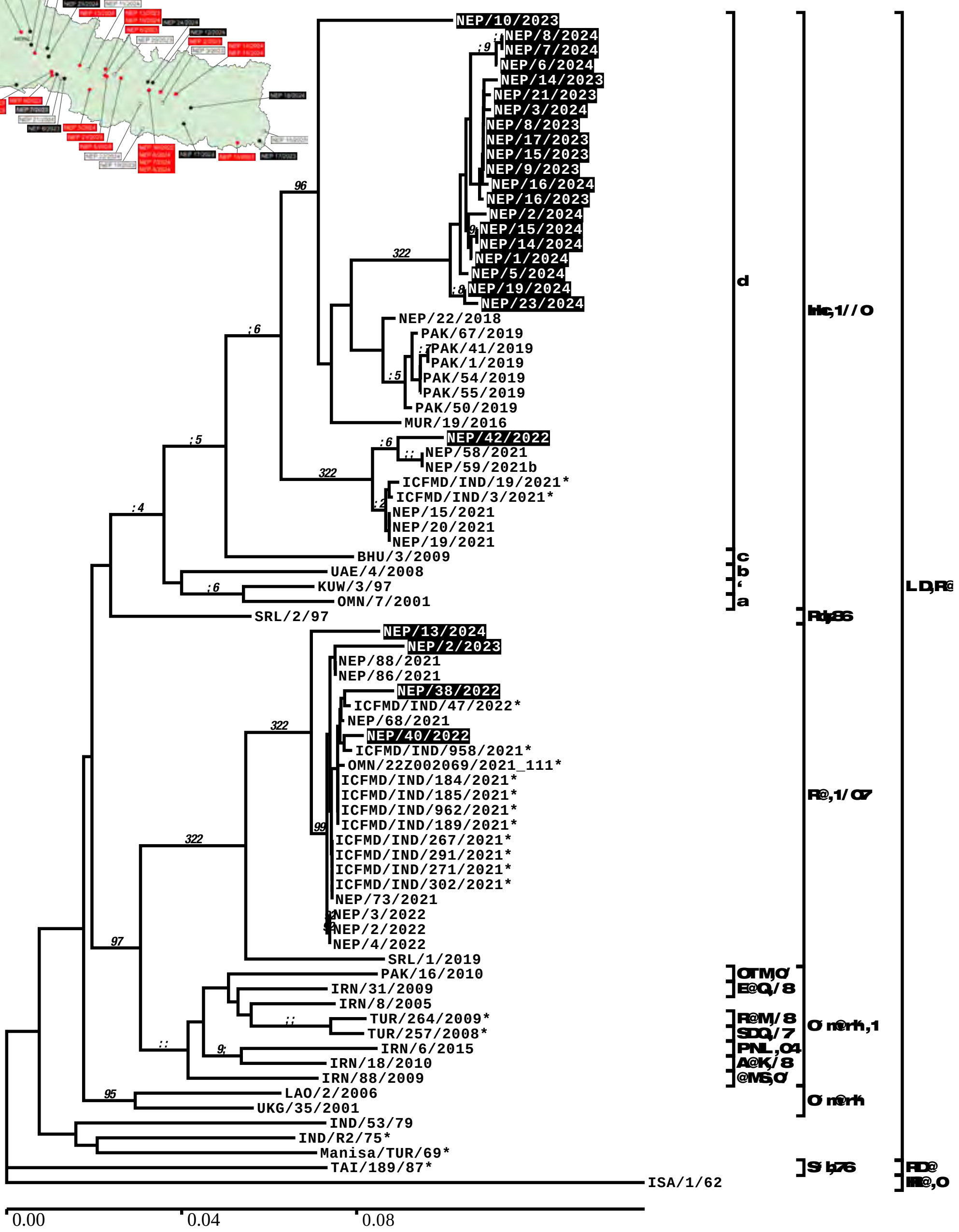
4.1. Pool 1 (Southeast Asia/Central Asia/East Asia)

The Republic of Indonesia	
Batch:	WRLFMD/2024/000009
Samples/sequences provided by:	Pusat Veteriner Farma
Date Received:	2 September 2024
Number Of Samples:	40
O (O/ME-SA/Ind-2001e)	20



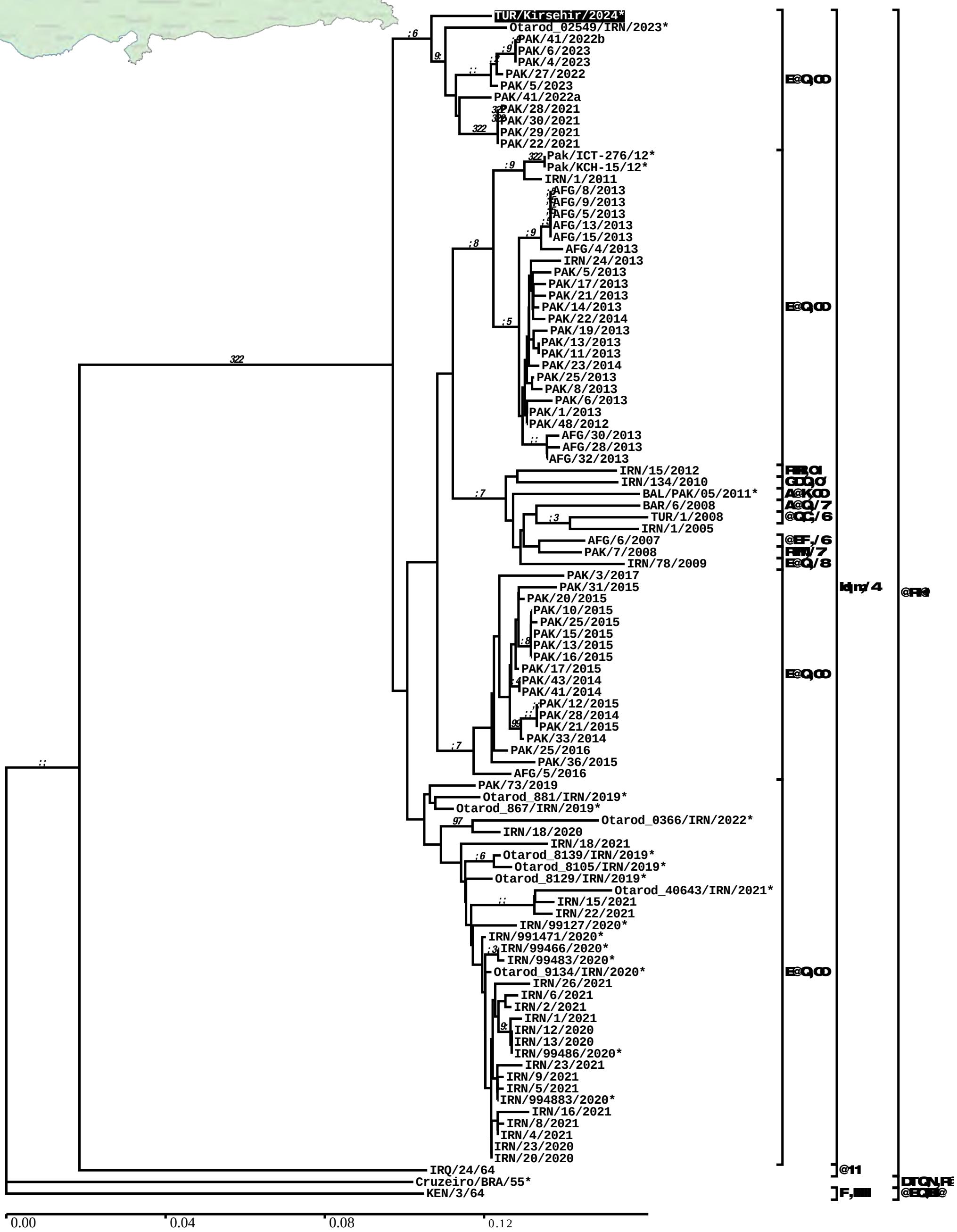
4.2. Pool 2 (South Asia)

Nepal	
Batch:	WRLFMD/2024/000008
Samples/sequences provided by:	National FMD and TADs Laboratory
Date Received:	4 July 2024
Number Of Samples:	50
O (O/ME-SA/ Ind-2001e)	21
O (O/ME-SA/SA-2018)	4



Pool 3 (West Eurasia and Near East)

The Republic of Türkiye	
Batch:	WRLMEG/2024/000011
Samples/sequences provided by:	Şap Enstitüsü
Date Received:	17 September 2024
Number Of Sequences:	1
A (A/Asia/Iran-05^FAR-11^)	1



4.3. Pool 4 (North and East Africa)

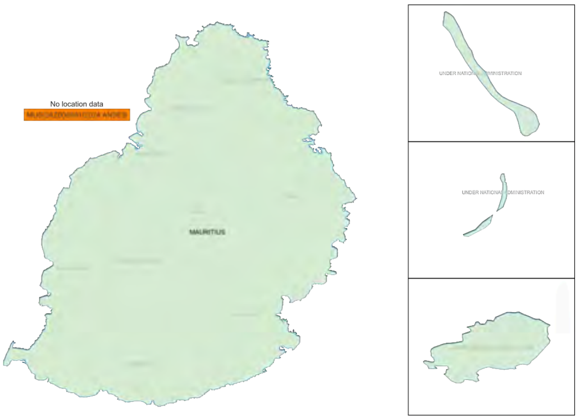
No samples/sequences received.

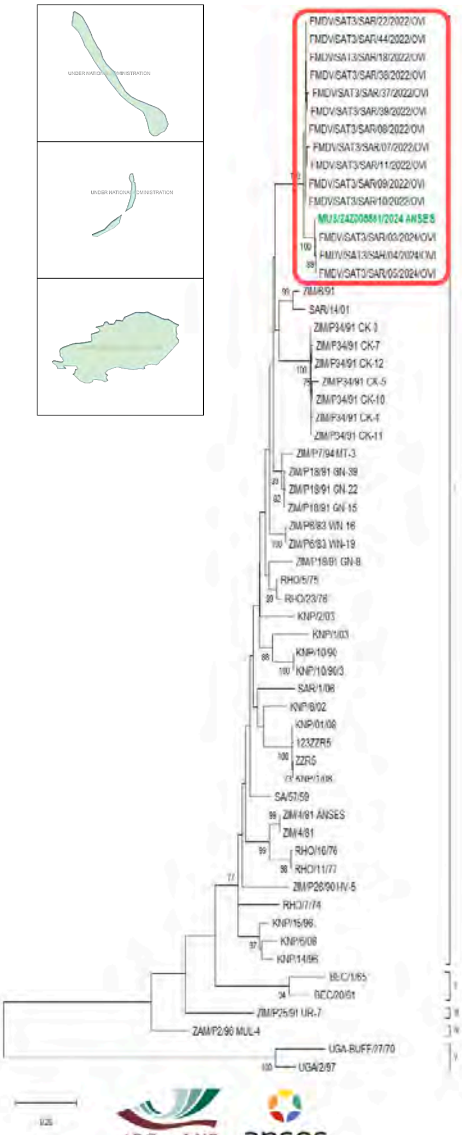
4.4. Pool 5 (West/Central Africa)

No samples/sequences received.

4.5. Pool 6 (Southern Africa)

Republic of Mauritius	
Batch:	NA
Samples/sequences provided by:	ANSES (France) and OVI (South Africa)
Date Received:	NA
Number of Sequences:	1
SAT3 (I)	1





4.6. Pool 7 (South America)

No samples/sequences received.

4.7. Vaccine matching

Antigenic characterisation of FMD field isolates by matching with vaccine strains by 2dmVNT from July - September 2024.

NOTES:

1. Vaccine efficacy is influenced by vaccine potency, antigenic match and vaccination regime. Therefore, it is possible that a less than perfect antigenic match of a particular antigen may be compensated by using a high potency vaccine and by administering more than one vaccine dose at suitable intervals. Thus, a vaccine with a weak antigenic match to a field isolate, as determined by serology, may nevertheless afford some protection if it is of sufficiently high potency and is administered under a regime to maximise host antibody responses (Brehm, 2008).
2. Vaccine matching data generated in this report only considers antibody responses in cattle after a single vaccination (typically 21 days after vaccination). The long-term performance of FMD vaccines after a second or multiple doses of vaccine should be monitored using post-vaccination serological testing.

Table 4: Summary of samples tested by vaccine matching.

Serotype	O	A	C	Asia 1	SAT 1	SAT 2	SAT 3
Ethiopia	-	-	-	-	-	5	-
Nepal	4	-	-	-	-	-	-
Total	**4**	**0**	**0**	**0**	**0**	**5**	**0**

* Note: the samples received from South American countries are from historical, and not current, outbreaks.

Abbreviations used in tables

For each field isolate the r_1 value is shown followed by the heterologous neutralisation titre (r_1-value / titre). The r_1 values shown below, represent the one-way serological match between vaccine strain and field isolate, calculated from the comparative reactivity of antisera raised against the vaccine in question. Heterologous neutralisation titres for vaccine sera with the field isolates are included as an indicator of cross-protection.

M	**Vaccine Match** *r_1 = ≥ 0.3 - suggests that there is a close antigenic relationship between field isolate and vaccine strain. A potent vaccine containing the vaccine strain is likely to confer protection.*
N	**No Vaccine Match** *r_1 = < 0.3* - suggest that the field isolate is antigenically different to the vaccine strain. Where there is no alternative, the use of this vaccine should carefully consider vaccine potency, the possibility to use additional booster doses and monitoring of vaccinated animals for heterologous responses.
NT	**Not tested against this vaccine**

NOTE: A "0" in the neutralisation columns indicates that for that particular field virus no neutralisation was observed at a virus dose of a 100 $TCID_{50}$.

NOTE: This report includes the source of the vaccine virus and bovine vaccinal serum. Vaccines from different manufactures may perform differently and caution should be taken when comparing the data.

Table 5: Vaccine matching studies for O FMDV

Serotype O			O 3039 *Boehringer Ingelheim*		O Campos *Boehringer Ingelheim*		O_1 Campos *Biogénesis Bagó*		O Manisa *Boehringer Ingelheim*		PanAsia 2 *Boehringer Ingelheim*		O/TUR/5/09 *MSD*	
Isolate	Topotype	Lineage	r_1	*titre*	r_1	*titre*	r_1	*titre*	r_1	*titre*	r_1	*titre*	r_1	*titre*
NEP 10/2023	ME-SA	Ind-2001	0.63	*1.88*	0.49	*2.21*	0.57	*2.65*	0.98	*2.45*	0.88	*2.45*	0.88	*2.28*
NEP 5/2024	ME-SA	Ind-2001	0.62	*1.87*	0.42	*2.13*	0.33	*2.30*	0.99	*2.45*	0.20	*1.89*	0.66	*2.16*
NEP 38/2022	ME-SA	SA-2018	0.84	*2.00*	0.45	*2.17*	0.66	*2.71*	0.98	*2.45*	0.50	*2.31*	0.89	*2.29*
NEP 13/2024	ME-SA	SA-2018	0.82	*1.99*	0.74	*2.27*	0.68	*2.72*	0.88	*2.40*	0.99	*2.49*	0.78	*2.23*

Table 6: Vaccine matching studies for SAT 2 FMDV

Serotype SAT 2			Eritrea 98 *Boehringer Ingelheim*		SAT2 Zim 83 *Boehringer Ingelheim*	
Isolate	Topotype	Lineage	r_1	*titre*	r_1	*titre*
ETH 26/2022	VII	Alx-12	0.68	1.84	0.24	2.01
ETH 27/2022	VII	Alx-12	0.74	1.94	0.20	1.93
ETH 11/2022	XIV	-	0.33	1.58	0.18	1.88
ETH 105/2022	XIV	-	0.26	1.49	0.17	1.87
ETH 1/2023	XIV	-	0.27	1.49	0.10	1.64

Annex 1: Sample data

Summary of submissions

Table 7: Summary of samples collected and received to WRLFMD July - September 2024

Country	№ of samples	Virus isolation in cell culture/ELISA								RT-PCR for FMD	
		FMD virus serotypes							No Virus		
		O	A	C	SAT 1	SAT 2	SAT 3	ASIA1		Positive	Negative
Indonesia	40	16	0	0	0	0	0	0	24	32	8
Nepal	50	18	0	0	0	0	0	0	32	40	10
TOTAL	**90**	**34**	**0**	**0**	**0**	**0**	**0**	**0**	**56**	**72**	**18**

Clinical samples

Table 8: Clinical sample diagnostics made by the WRLFMD July - September 2024

Country	Date		WRL for FMD Sample Identification	Animal	Date of Collection	Results		
	Received	Reported				VI/ELISA	RT-PCR	Final report
Indonesia	02 Sep 2024	18 Sep 2024	ISA 20/2024	Cattle	16 May 2024	O	FMDV GD	O
			ISA 19/2024	Cattle	19 Apr 2024	NVD	FMDV GD	FMDV GD
			ISA 18/2024	Cattle	28 Mar 2024	NVD	FMDV GD	FMDV GD
			ISA 17/2024	Cattle	14 Mar 2024	NVD	NGD	NVD
			ISA 16/2024	Cattle	07 Mar 2024	NVD	FMDV GD	FMDV GD
			ISA 15/2024	Cattle	07 Mar 2024	O	FMDV GD	O
			ISA 14/2024	Cattle	05 Mar 2024	NVD	FMDV GD	FMDV GD
			ISA 13/2024	Cattle	05 Mar 2024	O	FMDV GD	O
			ISA 12/2024	Cattle	04 Mar 2024	O	FMDV GD	O
			ISA 11/2024	Cattle	04 Mar 2024	O	FMDV GD	O
			ISA 10/2024	Goat	24 Feb 2024	NVD	NGD	NVD
			ISA 9/2024	Cattle	24 Feb 2024	O	FMDV GD	O
			ISA 8/2024	Cattle	24 Feb 2024	NVD	FMDV GD	FMDV GD
			ISA 22/2024	Cattle	29 May 2024	NVD	FMDV GD	FMDV GD
			ISA 21/2024	Cattle	29 May 2024	NVD	FMDV GD	FMDV GD
			ISA 7/2024	Cattle	24 Feb 2024	O	FMDV GD	O
			ISA 6/2024	Cattle	24 Feb 2024	O	FMDV GD	O
			ISA 5/2024	Cattle	22 Feb 2024	O	FMDV GD	O
			ISA 4/2024	Cattle	22 Feb 2024	O	FMDV GD	O
			ISA 3/2024	Cattle	20 Feb 2024	NVD	FMDV GD	FMDV GD
			ISA 2/2024	Cattle	20 Feb 2024	NVD	FMDV GD	FMDV GD

Country	Date		WRL for FMD Sample Identification	Animal	Date of Collection	Results		
	Received	Reported				VI/ELISA	RT-PCR	Final report
			ISA 1/2024	Cattle	07 Feb 2024	NVD	NGD	NVD
			ISA 15/2023	Cattle	28 Aug 2023	NVD	NGD	NVD
			ISA 14/2023	Cattle	21 Aug 2023	O	FMDV GD	O
			ISA 13/2023	Cattle	26 Jun 2023	NVD	NGD	NVD
			ISA 12/2023	Cattle	14 Jun 2023	NVD	NGD	NVD
			ISA 11/2023	Cattle	14 Jun 2023	NVD	FMDV GD	FMDV GD
			ISA 10/2023	Cattle	22 May 2023	NVD	FMDV GD	FMDV GD
			ISA 9/2023	Cattle	15 May 2023	NVD	NGD	NVD
			ISA 8/2023	Cattle	13 Feb 2023	O	FMDV GD	O
			ISA 7/2023	Cattle	30 Jan 2023	NVD	FMDV GD	FMDV GD
			ISA 6/2023	Cattle	26 Jan 2023	O	FMDV GD	O
			ISA 5/2023	Cattle	25 Jan 2023	O	FMDV GD	O
			ISA 4/2023	Cattle	24 Jan 2023	NVD	FMDV GD	FMDV GD
			ISA 3/2023	Cattle	11 Jan 2023	NVD	NGD	NVD
			ISA 2/2023	Cattle	10 Jan 2023	NVD	FMDV GD	FMDV GD
			ISA 1/2023	Cattle	10 Jan 2023	NVD	FMDV GD	FMDV GD
			ISA 9/2022	Cattle	24 Jul 2022	O	FMDV GD	O
			ISA 8/2022	Cattle	24 Jul 2022	O	FMDV GD	O
			ISA 7/2022	Cattle	23 Jul 2022	NVD	FMDV GD	FMDV GD
Nepal	04 Jul 2024	22 Jul 2024	NEP 24/2024	Buffalo	15 May 2024	NVD	FMDV GD	FMDV GD
			NEP 23/2024	Cattle	05 May 2024	NVD	FMDV GD	FMDV GD
			NEP 22/2024	Cattle	14 Apr 2024	NVD	NGD	NVD
			NEP 21/2024	Cattle	26 Mar 2024	NVD	NGD	NVD
			NEP 20/2024	Cattle	26 Mar 2024	NVD	FMDV GD	FMDV GD
			NEP 19/2024	Cattle	22 Mar 2024	NVD	FMDV GD	FMDV GD
			NEP 18/2024	Buffalo	07 Mar 2024	NVD	FMDV GD	FMDV GD
			NEP 17/2024	Cattle	07 Mar 2024	NVD	FMDV GD	FMDV GD
			NEP 16/2024	Cattle	08 Feb 2024	O	FMDV GD	O
			NEP 15/2024	Cattle	08 Feb 2024	O	FMDV GD	O
			NEP 14/2024	Buffalo	08 Feb 2024	NVD	FMDV GD	FMDV GD
			NEP 13/2024	Cattle	08 Feb 2024	O	FMDV GD	O
			NEP 12/2024	Cattle	01 Feb 2024	NVD	FMDV GD	FMDV GD
			NEP 11/2024	Buffalo	29 Jan 2024	NVD	NGD	NVD
			NEP 10/2024	Buffalo	29 Jan 2024	NVD	NGD	NVD
			NEP 9/2024	Buffalo	28 Jan 2024	NVD	FMDV GD	FMDV GD
			NEP 8/2024	Cattle	22 Jan 2024	O	FMDV GD	O
			NEP 7/2024	Buffalo	22 Jan 2024	O	FMDV GD	O
			NEP 6/2024	Goat	22 Jan 2024	O	FMDV GD	O
			NEP 5/2024	Cattle	10 Jan 2024	O	FMDV GD	O
			NEP 4/2024	Buffalo	10 Jan 2024	NVD	FMDV GD	FMDV GD

Country	Date		WRL for FMD Sample Identification	Animal	Date of Collection	Results		
	Received	Reported				VI/ELISA	RT-PCR	Final report
			NEP 3/2024	Cattle	07 Jan 2024	O	FMDV GD	O
			NEP 2/2024	Cattle	04 Jan 2024	NVD	FMDV GD	FMDV GD
			NEP 21/2023	Cattle	29 Dec 2023	O	FMDV GD	O
			NEP 20/2023	Cattle	27 Dec 2023	NVD	NGD	NVD
			NEP 19/2023	Buffalo	27 Dec 2023	NVD	NGD	NVD
			NEP 1/2024	Cattle	04 Jan 2024	O	FMDV GD	O
			NEP 18/2023	Cattle	22 Dec 2023	NVD	NGD	NVD
			NEP 17/2023	Cattle	22 Dec 2023	NVD	FMDV GD	FMDV GD
			NEP 16/2023	Cattle	13 Dec 2023	O	FMDV GD	O
			NEP 15/2023	Cattle	10 Dec 2023	O	FMDV GD	O
			NEP 14/2023	Cattle	04 Dec 2023	O	FMDV GD	O
			NEP 13/2023	Cattle	04 Dec 2023	NVD	FMDV GD	FMDV GD
			NEP 12/2023	Cattle	30 Nov 2023	NVD	FMDV GD	FMDV GD
			NEP 11/2023	Cattle	07 Nov 2023	NVD	NGD	NVD
			NEP 10/2023	Cattle	07 Nov 2023	O	FMDV GD	O
			NEP 9/2023	Cattle	07 Nov 2023	O	FMDV GD	O
			NEP 8/2023	Cattle	05 Nov 2023	O	FMDV GD	O
			NEP 7/2023	Cattle	02 Nov 2023	NVD	FMDV GD	FMDV GD
			NEP 6/2023	Cattle	16 Oct 2023	NVD	FMDV GD	FMDV GD
			NEP 5/2023	Cattle	23 May 2023	NVD	FMDV GD	FMDV GD
			NEP 4/2023	Goat	22 Mar 2023	NVD	FMDV GD	FMDV GD
			NEP 3/2023	Buffalo	26 Jan 2023	NVD	NGD	NVD
			NEP 2/2023	Buffalo	12 Jan 2023	O	FMDV GD	O
			NEP 1/2023	Goat	12 Jan 2023	NVD	FMDV GD	FMDV GD
			NEP 42/2022	Cattle	21 Dec 2022	NVD	FMDV GD	FMDV GD
			NEP 41/2022	Cattle	21 Dec 2022	NVD	NGD	NVD
			NEP 40/2022	Cattle	17 Oct 2022	NVD	FMDV GD	FMDV GD
			NEP 39/2022	Cattle	30 Aug 2022	NVD	FMDV GD	FMDV GD
			NEP 38/2022	Cattle	21 Aug 2022	O	FMDV GD	O
TOTAL			**90**					

Annex 2: FMD publications

Recent FMD Publications July - September 2024 cited by Web of Science.

1. Al-Ebshahy, E., R.E. El-Ansary, J. Zhang, Y. Badr, A. Rady, S. El-Ashram, Y.B. Ma, M. Yuan, and E. Elgendy (2024). Sequence and phylogenetic analysis of FMD virus isolated from two outbreaks in Egypt. *Infection Genetics and Evolution*, **123**: 8. DOI: 10.1016/j.meegid.2024.105651.
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11. Dobson, S.J., J.C. Ward, M.R. Herod, D.J. Rowlands, and N.J. Stonehouse (2024). A highly discriminatory RNA strand- specific assay to facilitate analysis of the role of cis-acting elements in *Foot-and-mouth disease virus* replication (vol 104, 001871, 2023). *Journal of General Virology*, **105**(5): 1. DOI: 10.1099/jgv.0.001993.

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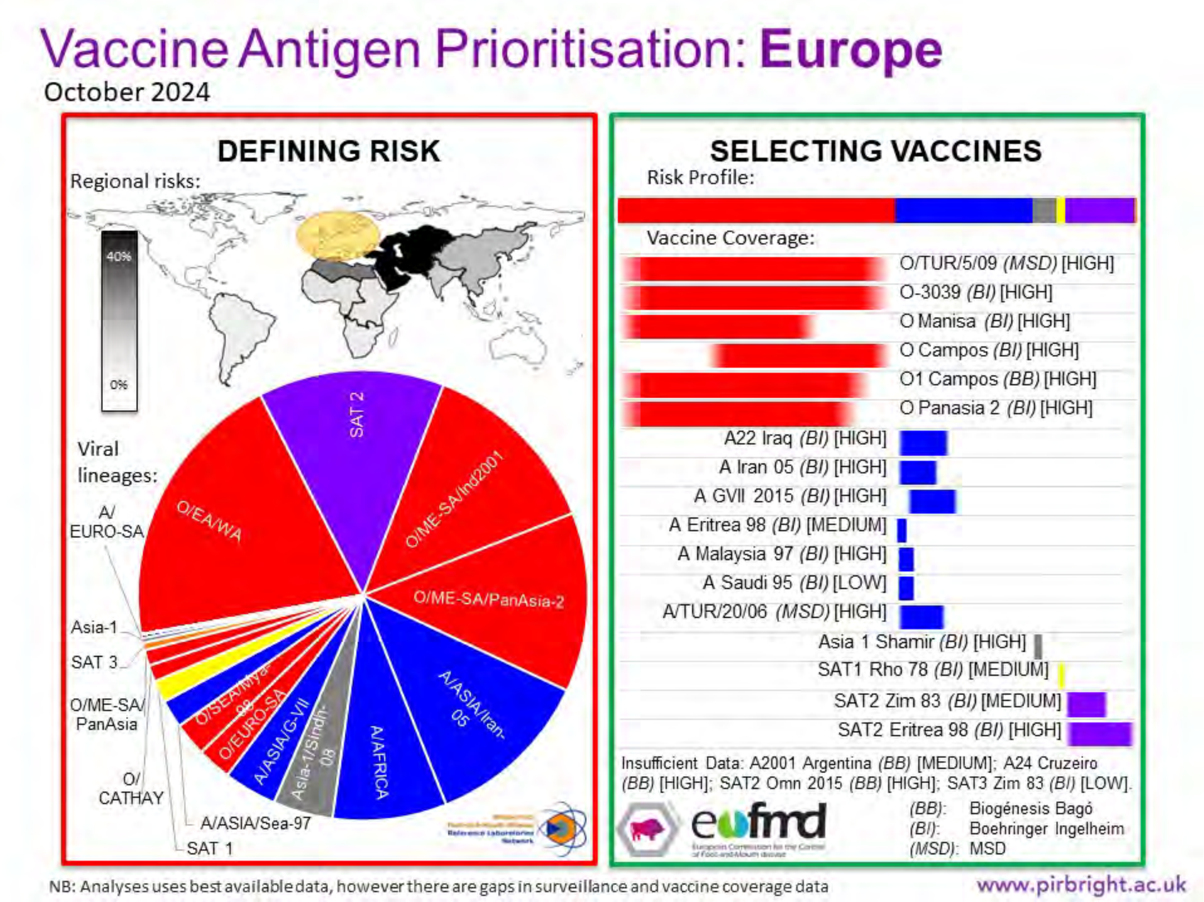
Annex 3: Vaccine recommendations

This report provides recommendations of FMDV vaccines to be included in antigen banks. These outputs are generated with a tool (called PRAGMATIST) that has been developed in partnership between WRLFMD and EuFMD (http://www.fao.org/3/cb1799en/cb1799en.pdf). These analyses accommodate the latest epidemiological data collected by the WOAH/FAO FMD reference laboratory network regarding FMDV lineages that are present in different *source regions* (see Table 1 in Section 3.9, above), as well as available *in vitro, in vivo* and field data to score the ability of vaccines to protect against these FMDV lineages.



Please contact WRLFMD or EuFMD for assistance to tailor these outputs to other geographical regions. NB: Vaccine-coverage data presented is based on available data and may under-represent the true performance of individual vaccines.

Further information about the PRAGMATIST system has been published in *Frontiers in Veterinary Science* - see: https://doi.org/10.3389/fvets.2022.1029075.

Annex 4: Brief round-up of EuFMD and WRLFMD activities

Courses & Training

- The EuFMD's open-access Courses provide convenient self-paced training which you may study anytime, anywhere, free of charge:
  - **Introduction to Foot-and-Mouth Disease** (*also available in French*); Provides an overview of foot-and-mouth disease (FMD), recognize or suspect the disease in the field, identify the correct samples to collect and the relevant control measures.
  - **Introduction to the socioeconomics of foot-and-mouth and similar transboundary animal diseases**; the socioeconomics of foot-and-mouth and similar transboundary (FAST) animal diseases.
  - **Introduction to sheep pox and goat pox**; Provides an overview of sheep pox and goat pox, recognise or suspect the disease in the field, identify the correct samples to collect and the relevant control measures.
  - **Introduction to Lumpy Skin Disease** (*also available in French*), This online module has been made available to support animal health practitioners in countries that are currently affected by, or at risk of lumpy skin disease (LSD).
  - **Introduction to Rift Valley Fever** (*also available in French*); Build your understanding of Rift Valley fever diagnosis, surveillance, prevention and control. This course is intended to be of interest to veterinarians and veterinary para-professionals working in countries that are at risk of Rift Valley Fever epizootics.
  - **Introduction to Animal Health Surveillance**; Provides an overview of the importance and key activities of surveillance within the overall context of animal health. It also forms the basis for further, in-depth courses on passive surveillance.
  - **What is the Progressive Control Pathway?** (*also available in Arabic*); Provides an overview of the Progressive Control Pathway for Foot-and-Mouth Disease (PCP-FMD). This introduction will be interesting for anyone who is new to the PCP-FMD, and who would like a rapid guide to its key features.
  - **Introduction to the Risk Assessment Plan** (*also available in French*); The course consists of five self-directed online modules. These modules describe the purpose of the Risk Assessment Plan, give guidance on how to develop a risk assessment plan and explain they key content that should be included within each chapter of the Risk Assessment Plan document.
  - **Introduction to the Risk-Based Strategic Plan**; The course consists of six self-directed online modules. These modules describe the purpose of the Risk-Based Strategic Plan, give guidance on how to develop a risk-based control strategy and explain they key content that should be included within each chapter of the Risk-Based Strategic Plan document.
  - **Introduction to the Official Control Programme**; he course consists of six self-directed online modules. These modules describe the purpose of the OCP, give guidance on how to develop an OCP and explain they key content that should be included within each chapter of the OCP document.

- **Introduction to the FMD Minimum Biorisk Management Standards**; Provides an overview of the Minimum Biorisk Management Standards for foot-and-mouth disease laboratories (MBRMS), explaining the scope and the risks associated with the standards.

- **RTC35 - Real-Time training** from 26 to 29 November 2024 in Nakuru, Kenya.

Meetings

- **104th Executive Committee of the EuFMD** - 26 October 2024
- **Open Session of the Standing Technical Committee of the EuFMD - OS24 in Madrid, Spain** - 29 to 31 October 2024
- **105th Executive Committee of the EuFMD** - 12 March 2025
- **46th General Session of the EuFMD** - 6 to 7 May 2025

Other sources of information from EuFMD

- EuFMD webpages (https://www.fao.org/eufmd/).
- EuFMD has a constantly updated series of short podcasts relating to the FAST world (http://www.fao.org/eufmd/resources/podcasts/).
- Leaflets on FMD in Arabic, Bosnian, Bulgarian, English, Greek and Montenegrin for the Thrace region (https://www.fao.org/publications/card/en/c/CB4903EN).
- Join the EUFMD Telegram channel to receive EuFMD updates (https://t.me/eufmd).

Proficiency test scheme organised by WRLFMD

A report for the FMD PTS (Phase XXXV, supported with funding from EuFMD and UK Defra) is being prepared and will be circulated to all of the participating laboratories shortly. Any laboratories interested in participating in future exercises for 2025 should contract the WRLFMD for further information. The progress of this PTS will be described in future quarterly reports.

FAO four betters. Better life, better environment, better nutrition, better production.

EuFMD's programme, tools and initiatives

FAST
Foot-and-mouth And Similar Transboundary animal diseases

Dt
EuFMD digital transformation

Tom
EuFMD training management system

Microlearning
EuFMD micro learning

Vlearning
EuFMD virtual learning

Sim Ex On
Simulation exercises online

Get prepared
Emergency preparedness toolbox

Risk Comms
EuFMD risk communications

RMT-FAST
Risk monitoring tool for foot-and-mouth and similar transboundary animal diseases

Pragmatist
Prioritization of antigen management with international surveillance tool

EuFMDiS
European foot-and-mouth disease spread model

Vademos
FMD vaccine demand estimation model

GVS
Global vaccine security

PQv
Vaccine prequalification

PCP
Progressive control pathway

PSO
Pcp practitioner officers

PPP
Public private partnership

PROTECT
RESPOND
CONTROL

MOVE FAST

FAST, Foot-and-mouth
And Similar Transboundary
animal diseases.

EuFMD structure

Secretariat, Executive Committee, Standing Technical Committee (STC), Special Committee on Risk Monitoring, Integrated Surveillance and Applied Research (SCRISAR), Special Committee on Biorisk Management (SCBRM), Regional Groups for FAST Coordination, Standing Committee on Prequalification of Vaccines against FAST diseases (SCPQv), Steering Committee TOM (SCTOM).

EuFMD Secretariat

Animal Production and Health Division, (NSA) / European Commission for the Control of Foot-and-Mouth Disease (EuFMD)

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