Food and Agriculture Organization of the United Nations

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

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

FMD 2025 OCT NOV DEC Quarterly Report

2025 Foot-and-mouth disease quarterly report
October-November-December

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

2023-2027 Strategy
Move FAST
Get prepared

Funded by the European Union

This report is version 2

The year on the cover page has been corrected from 2024 to 2025.

On page 1: "*... new data generated by the VDRL during this quarter has confirmed SAT1/I cases in Egypt.*" has been corrected to "*... new data generated by the WRLFMD during this quarter has confirmed SAT1/I cases in Egypt.*"

All maps within this document were drawn using the United Nations Map (UNMap) v2020, supplied to the authors by FAO or The Global Administrative Unit Layers (GAUL) 2024 produced by the FAO (doi: 10.4060/cd4262en). The following disclaimers apply to the maps in this document.

The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

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

1. Highlights and headlines 1
2. General overview 2
3. Summary of FMD outbreaks and intelligence 3
   3.1. Overview of reports 3
   3.2. Pool 1 (Southeast Asia/Central Asia/East Asia) 3
   3.3. Pool 2 (South Asia) 5
   3.4. Pool 3 (West Eurasia and Near East) 5
   3.5. Pool 4 (North and Eastern Africa) 8
   3.6. Pool 5 (West/Central Africa) 10
   3.7. Pool 6 (Southern Africa) 10
   3.8. Pool 7 (South America) 11
   3.9. Extent of global surveillance 11
4. Detailed analysis 14
   4.1. Pool 1 (Southeast Asia/Central Asia/East Asia) 14
   4.2. Pool 2 (South Asia) 14
   4.1. Pool 3 (West Eurasia and Near East) 15
   4.2. Pool 4 (North and East Africa) 17
   4.3. Pool 5 (West/Central Africa) 24
   4.4. Pool 6 (Southern Africa) 24
   4.5. Pool 7 (South America) 24
   4.6. Vaccine matching 24

Annex 1: Sample data 26
   Summary of submissions 26
   * Sequencing results will be included in the next Quarterly Report 26
   Clinical samples 26

Annex 2: FMD publications 32

Annex 3: Vaccine recommendations 38

Annex 4: Brief round-up of EuFMD and WRLFMD activities 39
   Courses & Training 39
   Meetings 41

Abbreviations and acronyms

AHI	Animal Health Institute, Ethiopia
AHRI	Animal Health Research Institute, Egypt
EuFMD	European Commission for the Control of Foot-and-Mouth Disease
EURL for FMD	European Union Reference laboratory for Foot-and-mouth disease
FAO	Food and Agriculture Organization of the United Nations
FAST reports	foot-and-mouth and similar transboundary animal diseases reports
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
GFRA	Global Foot-and-Mouth Disease Research Alliance
GF-TAD	Global Framework for the Progressive Control of Transboundary Animal Diseases
NAHDIC	National Animal Health Diagnostic and Investigation Center, Ethiopia
NT	not tested
NVD	no virus detected
NRL	National reference Laboratory
rRT-PCR	real-time reverse transcription polymerase chain reaction
SAT	Southern African Territories
SVD	swine vesicular disease
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

Welcome to this last FMD status report for 2025 which summarises the current FMD global risks by bringing together data from the WRLFMD with other disease intelligence information. During the past three months, the WRLFMD has reported test results for samples received Ethiopia, Kenya, Thailand and Nepal. In addition, new sequences have been submitted for analyses associated with FMD cases in Türkiye (from Şap Enstitüsü, Türkiye) and Iran (GenBank).

In the Middle East, the FMD situation remains very dynamic due to the presence of endemic serotypes/strains and the incursion of viruses from Southern Asia and East Africa. In this region, headline events over the past twelve months have been dominated by the spread of the exotic SAT 1 serotype (topotype I) from East Africa, where new data generated by the WRLFMD during this quarter has confirmed SAT1/I cases in Egypt. Data presented at the GFRA meeting in October from the National Reference Laboratory in Türkiye highlighted the importance of SAT1 in the country where 478/880 outbreaks recorded during 2025 were due to this serotype. Data provided FMD Reference Laboratories has been used to prepare a risk assessment to raise awareness to other countries in the region (https://www.fao.org/animal-health/rapid-risk-assessment-fmd/en). During November, the epidemiological situation was further complicated by the detection of the serotype SAT 1/III topotype in Iran and Türkiye. These sequences are distinct to those from the SAT1/I field outbreaks and closely related to a virus (called BOT/1/77) that is used as a vaccine master seed. These findings require urgent investigation by the veterinary authorities in the affected countries to understand whether there has been the escape of a vaccine into the field either from a manufacturing site or an incompletely inactivated vaccine. During December 2025, an FMD outbreak due to serotype SAT 1 (topotype/genotype to be confirmed) was reported in northern Cyprus, representing the third incursion of FMD into the European region during 2025. [Extra note: two sample shipments have been received from Azerbaijan and Lebanon during January 2026; for both shipments, SAT1/III has been detected; data that will be described in the next Quarterly Report].

Sequence analyses for exotic FMDV serotypes (SAT1/I and SAT2/XIV) in West Asia point to an origin from East Africa. In 2022-23, samples collected by AHI (Ethiopia) recorded an upsurge in SAT2/XIV field cases at the same time that this topotype was detected in the Middle East (https://pubmed.ncbi.nlm.nih.gov/41346563/). In this report, we describe results for a new batch of samples, where sequences are dominated by the presence of FMD viruses from the O/EA-2 topotype (83.7% of the VP1 sequences retrieved). These results are unexpected since they represent the first time that this topotype has been detected in the country. Further sequencing results for samples collected elsewhere in East Africa (in Kenya) are expected for the next report.

Published information on these samples can be retrieved from the following website (http://www.wrlfmd.org/). We also maintain a web-based dashboard (OpenFMD: http://www.openfmd.org) to allow users to retrieve and interrogate FMDV sequences, review FMD surveillance data and perform custom analyses for vaccine selection using PRAGMATIST, where new data from the FMD Network has updated the regional risks (see Table 1 in this report).

Don King, Pirbright, January 2026

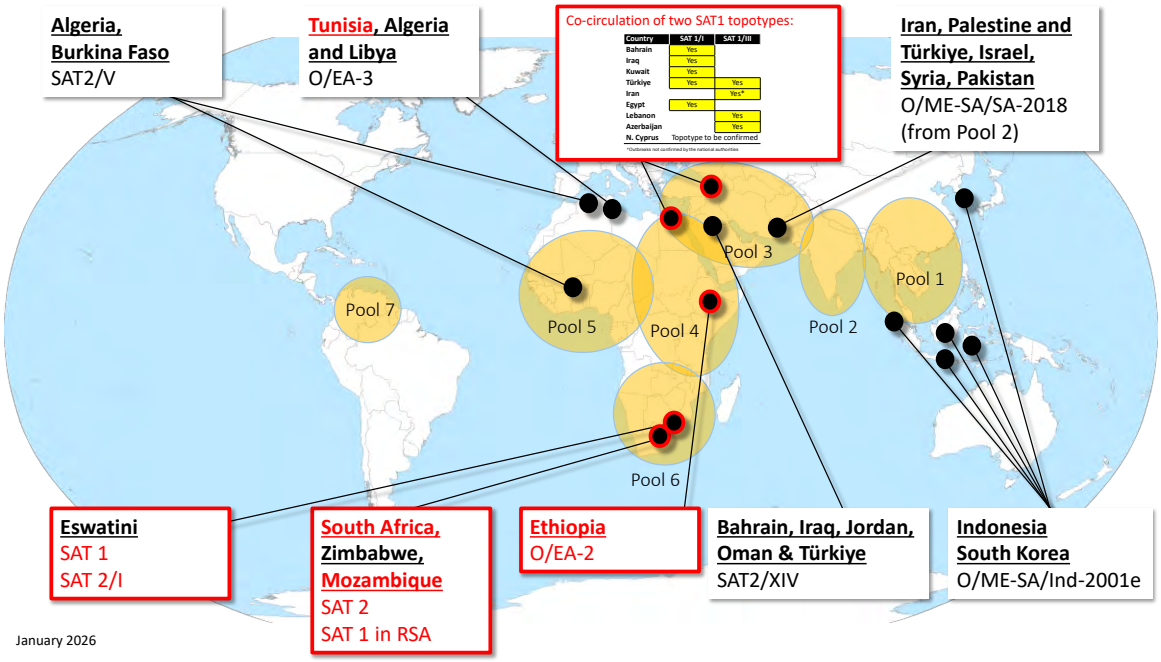


Figure 1: Recent FMD outbreaks with global epidemiological significance.

Note: New headline events reported October to December 2025 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.

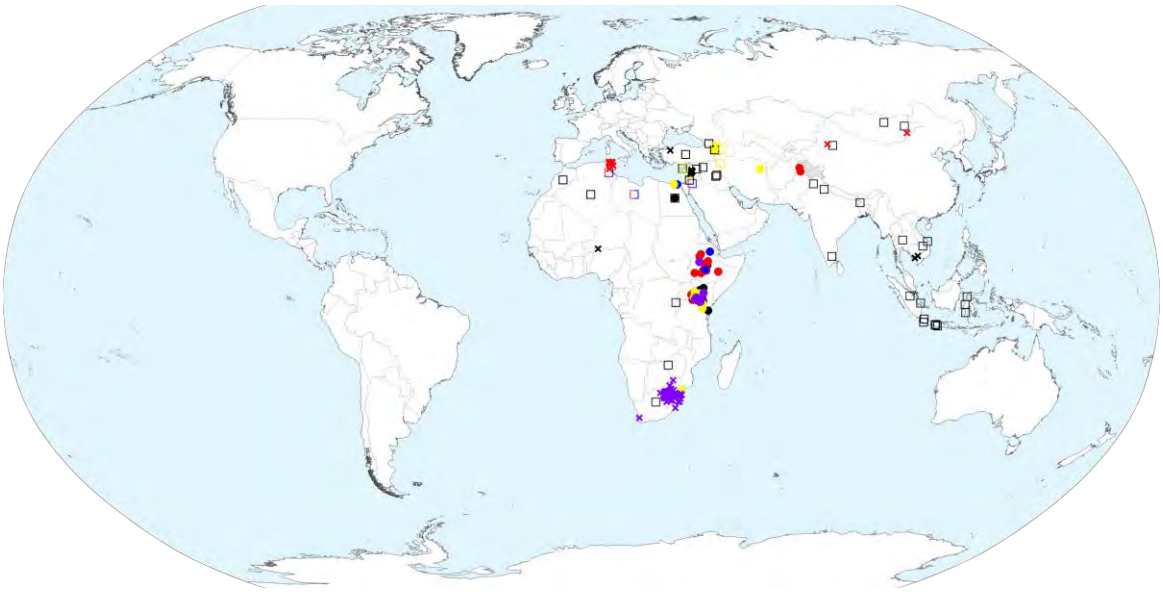


Figure 1: Samples tested by WRLFMD or reported in this quarter. ● indicates samples analysed; × indicates outbreaks reported/updated to the WOAH this quarter; □ indicates reports of FMD from other sources. Shape colours define the serotype detected ●O; ●A; ●C; ●Asia1, ●SAT1, ●SAT2, ●SAT3, ● serotype undetermined/not given in the report, ○ FMD not detected.

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

Note: in the sections below, there are references to ProMED posts, where only the title of the post is indicated. ProMED is now a subscription service, so access to these posts may be restricted.

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

The Kingdom of Cambodia

In October, there were two reports of **untyped FMD** affecting cattle in Prey Vêng (cases in July) and Kep (cases in September). These new data were provided as a further update to the outbreak that was first reported in January 2025.

WAHIS event ID: 6221

• Foot and mouth disease - Cambodia (04): cattle, WOAH	ProMED posts: 8728137,
• Foot and mouth disease - Cambodia (05): cattle, WOAH	8728566

the People's Republic of China

In November an outbreak of **FMD type O** was reported via WAHIS. The disease was identified in 10 cattle at the ErbaTai Animal Quarantine Station, Kuqa, Aksu, Xinjiang Uygur. A total of 120 animals were culled.

WAHIS event ID: 6926

- Foot and mouth disease - China (06): (Xinjiang Uygur) cattle, serotype O, WOAH
- Foot and mouth disease - China (05): (Xinjiang Uygur) cattle, serotype O, WOAH

ProMED posts: 8728469, 8729335

The Republic of Indonesia

In November, nine outbreaks of **untyped FMD** in domestic mammals (242 cases) were reported by the national authorities on the FAO's Empres-i+ system.

Empres-i+ event IDs: 417849 to 417857

Mongolia

One outbreak of **FMD type O** was reported in December on WAHIS. The outbreak affected sheep from Ongon, Sühbaatar, Mongolia. The cases were discovered after the screening of sheep and goats in some provinces. Over 3000 animals in the suspected areas will be vaccinated in response.

WAHIS event ID: 7129

- Foot & mouth disease - Mongolia (05): (Dornod) sheep, serotype O, WOAH
- Foot & mouth disease - Mongolia (06): (Sühbaatar) sheep, serotype O, WOAH

ProMED posts: 8727874, 8729529

The Kingdom of Thailand

Foot And Mouth Disease, Theileriosis - Thailand: (Surin) cattle, buffalo, mass fatalities, alert

ProMED post: 8729234

3.3. Pool 2 (South Asia)

The People's Republic of Bangladesh

Foot & Mouth Disease - Bangladesh: (Rangpur) cattle

ProMED post: 8729781

The Republic of India

- Foot & Mouth Disease, Japanese Encephalitis - India: (Arunachal Pradesh) domestic mithun, pig
- Foot & Mouth Disease - India: (Punjab) cattle, fatal
- Foot & Mouth Disease - India (02): (Uttar Pradesh) cattle, fatal
- Foot & Mouth Disease - India (03): (Tamil Nadu) cattle, mass vaccination

ProMED posts: 8728196, 8729165, 8729525, 8729688

3.4. Pool 3 (West Eurasia and Near East)

Armenia

Passive and active surveillance for FMD is used in Armenia, as well as awareness-raising activities for farmers and the veterinary services. During this quarter, over 300,000 large and small ruminants were vaccinated with a pentavalent vaccine (O, A, Asia 1 and SAT 2), and 1.8 million with a SAT 1 vaccine. A post vaccination serosurvey has been completed and the results are being analysed.

EuFMD FAST Report

The Republic of Azerbaijan

A single outbreak of SAT 1 was recorded in the Agstafa District in October, with no indications of secondary infections or onward transmission. As well as passive and active surveillance across the country, a protection/surveillance zone around the SAT 1 outbreak was put in place this quarter. During this period 8.6 million animals were vaccinated across the country including SAT 1 vaccination in response to the outbreak from the end of November.

EuFMD FAST Report

An outbreak of **FMD type SAT 1** in cattle from Jeyranchol, Agstafa District were reported via WAHIS at the end of October. Clinical observations and laboratory testing of animals within 10km of the outbreak have revealed no new cases of FMD.

WAHIS event ID: 6951

FMD type SAT 1 affecting domestic cattle and small ruminants (2 cases) was reported in the Jeyranchol, Azerbaijan in October on the FAO's Empres-i+ system.

Empres-i+ event ID: 417527

Cyprus

A FMD type SAT 1 outbreak affecting domestic cattle was reported in Boğaziçi, Lapatos, Cyprus in December on the FAO's Empres-i+ system.

Empres-i+ event ID: 423806

Foot & Mouth Disease - Cyprus: restrictions applied — ProMED post: 8729776

Georgia

Over 300,000 animals have been vaccinated against FMD this quarter. A total of 4000 samples were collected and tested for sero-monitoring, with analysis of the results on-going.

EuFMD FAST Report

The Islamic Republic of Iran

One **FMD type SAT 1** sequence for phylogenetic analysis was retreived from GenBank in November. This unofficial data provides evidence for the presence of the SAT1/III topotype in Iran (see below).

FMD type SAT 1 affecting domestic cattle was the Doab Buka, Iran was reported by the national authorities on the FAO's Empres-i+ system.

Empres-i+ event ID: 416851

The Republic of Iraq

Across the country, more than 950 cases in 118 outbreaks for FMD were recorded this quarter. Circulation of SAT1 and O serotypes was reported.

EuFMD FAST Report

The Hashemite Kingdom of Jordan

Passive surveillance for FMD is established and a pilot initiative for syndromic surveillance for the early detection of FAST diseases is ongoing. Over 2.2 million animals have been vaccinated this quarter using a vaccine containing serotypes O, A and SAT 2.

EuFMD FAST Report

The Lebanese Republic

Untyped FMD was reported during December on WAHIS. On 9th December, 41 outbreaks of FMD were reported in cattle from two locations in Bekka Governate. Later, on the 30th December, an outbreak in a mixed heard of sheep and goats from Baalbak-Hermel Governate and 11 outbreaks in cattle from locations in Akkar and Baalbak-Hermel governates were also reported.

WAHIS event ID: 7086

During this quarter, 94 outbreaks, some due to serotype SAT 1, have been reported. Passive and active surveillance are in use and a vaccination campaign started in December 2025.

EuFMD FAST Report

The Syrian Arab Republic

Outbreaks of FMD are suspected in several governates. Passive surveillance is being conducted nationwide, and active surveillance is being conducted in Hama, Damascus and Aleppo governorates. Over 400,000 cattle and sheep have been vaccinated this quarter.

EuFMD FAST Report

Türkiye

In November, a VP1 sequence submitted to the WRLFMD from Şap Enstitüsü, Türkiye was submitted to the WRLFMD which confirmed the presence of the SAT1/III topotype in the country (see below)
In November, one outbreak of **untyped FMD** in 5 cattle from Cumhuriyet in Bilecik Merkez, Bilecik was reported via WAHIS

WAHIS event ID: 7026

During this quarter there were 830 outbreaks of FMD (all in the Anatolia region), caused by serotypes SAT 1 in the majority of cases.
There is passive and active surveillance for FMD in the country. Vaccination campaigns this quarter have vaccinated 12.3 million animals with a pentavalent (O, A, Asia-1, SAT 1 & SAT 2) vaccine

EuFMD FAST Report

Data on the EU's ADIS summaries reported 240 outbreaks of FMD type SAT 1 in October, 251 in November and 214 in December. Additionally, 2 outbreaks of FMD type O was reported in October; while 123 outbreaks of FMD that were untyped/serotype pending were also reported during this quarter.

ADIS

3.5. Pool 4 (North and Eastern Africa)

The People's Democratic Republic of Algeria

No outbreaks have been reported this quarter, but there are suspicions of FMD near the eastern borders. Over 800,000 cattle were vaccinated against serotypes O, A and SAT 2 since May.

EuFMD FAST Report

The Federal Democratic Republic of Ethiopia

A batch of 72 samples was received on 11th September 2025. The following viruses were identified: 41 **FMD type O** (*O/EA-2*), 5 **FMD type O** (*O/EA-3*), 2 **FMD type A** (*A/AFRICA/G-IV*) and 1 **FMD type SAT 2** (*SAT 2/XIV*) (see below). FMDV genome was detected a further 11 samples.

The Arab Republic of Egypt

A batch of 4 samples was received on 4th December 2025. The following viruses were identified: 1 **FMD type A** (*A/G-IV*) and 1 **FMD type SAT 1** (*SAT 1/I - NWZ)*) (see below). FMDV genome was detected in the remaining 2 samples.

Egyptian authorities have reported 12 outbreaks of FMD this quarter.
During this quarter a clinical survey covering more than 4000 villages and an investigation in over 350 markets have been completed. While vaccination with a trivalent

vaccine (O, A & SAT 2) has been achieved for 3.8 million animals and with a monovalent SAT 1 vaccine for 4.6 million animals.

EuFMD FAST Report

The Republic of Kenya

A batch of 119 samples was received on 7th November 2025. The following viruses were identified: 16 **FMD type O,** 3 **FMD type A**, 10 **FMD type SAT 1** and 6 **FMD type SAT 2**. FMDV genome was detected in a further 15 samples. Sequence analyses for these FMDV positive samples will be included in the next Quarterly Report

The State of Libya

There is passive surveillance for FMD in the country, which has reported no outbreaks this quarter. The Libyan FMD vaccination strategy is to vaccinate large ruminants twice a year.

EuFMD FAST Report

The Kingdom of Morocco

A large-scale vaccination program is in place, with vaccination coverage exceeding 90% in the country.

EuFMD FAST Report

The Republic of Rwanda

Livestock movements in three sectors of Rubavu District, Rwanda have been suspended after FMD was confirmed in the area. Vaccination for animals over 6 months old was also mandated

Local Media

The Republic of Tunisia

FMD type O was reported via WAHIS from various locations in Tunisia at the end of December. There were 7 outbreaks in cattle from Ariana, Ben Arous, Manubah, Sidi Bou Zid, Siliana & Béja governorates; 1 outbreak in sheep from Sousse Governorate and 1 outbreak in a mixed herd of sheep and goats from Siliana Governorate.

WAHIS event ID: 5379

A trivalent vaccine containing O, A and SAT 2 is in use in the country.

EuFMD FAST Report

3.6. Pool 5 (West/Central Africa)

The Federal Republic of Nigeria

One outbreak of **untyped FMD** was reported in December on WAHIS. The outbreak, from January 2025, affected cattle from Wamakko, Sokoto, Nigeria.

WAHIS event ID: 7114

Foot & mouth disease - Nigeria: (Jigawa) outbreak, livestock — ProMED posts: 8727993

3.7. Pool 6 (Southern Africa)

The Kingdom of Eswatini

During this quarter 38 outbreaks of **FMD type SAT 1**, 26 outbreaks of **FMD type SAT 2** and 8 outbreaks of **untyped FMD** were reported via WAHIS. The outbreaks have affected cattle in Lubombo (SAT 1=29, SAT 2=22 & untyped=8), Manzini (SAT 1=8), Shiselweni (SAT 2=4) and Hhohho (SAT 1=1) regions.

WAHIS event ID: 6487 & 6895

The Republic of Mozambique

Two outbreaks of **FMD type SAT 2** from October were reported via WAHIS this quarter. Both outbreaks were from Maputo Province and affected cattle.

WAHIS event IDs: 6880 & 6974

The Republic of South Africa

In this quarter, 260 **FMD type SAT 2** outbreaks in cattle were reported in Free State (n = 171), Gauteng (n = 40), KwaZulu-Natal (n = 6), Limpopo (n = 3), Mpumalanga (n = 15), North West (n = 24) and Western Cape (n = 1) Provinces via WAHIS. Additionally, 2 outbreaks of **FMD type SAT 1** in cattle were reported in November.
A total of 255 cases of SAT 1 and 5376 cases of SAT 2, with no deaths, were recorded.

WAHIS event IDs: 3738, 6930

Foot & Mouth Disease - South Africa: cattle, emergency vaccination — ProMED post: 8729059

The Republic of Zimbabwe

Foot & Mouth Disease, Livestock - Zimbabwe: (Matabeleland North) outbreak

ProMED post: [8729285](8729285)

3.8. Pool 7 (South America)

No new outbreaks of FMD were reported in South America.

3.9. Extent of global surveillance

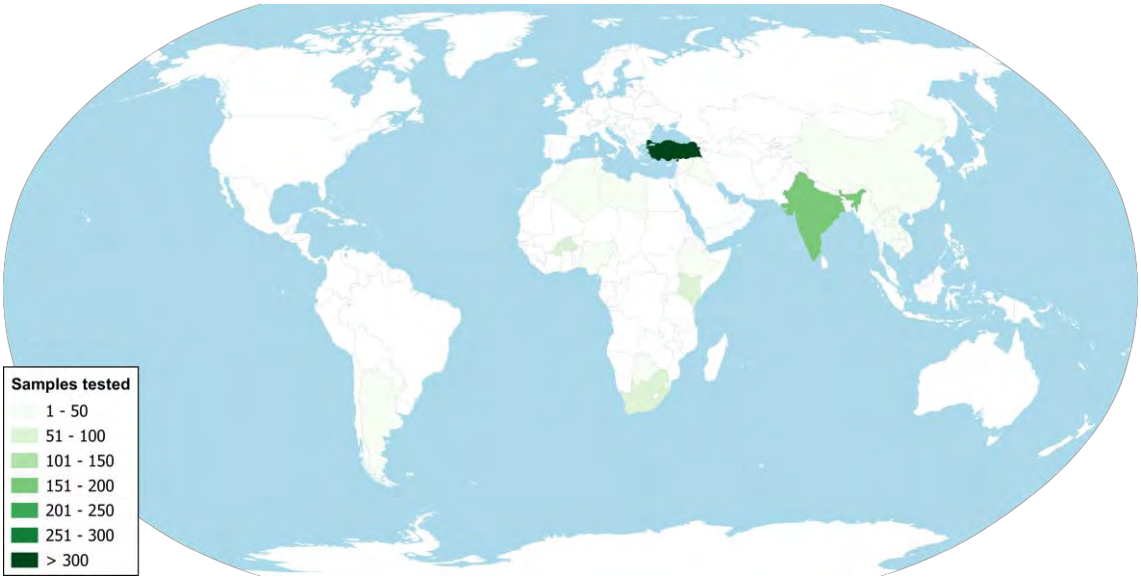


Figure 2: Review of samples received to WOAH/FAO FMD laboratories during 2025 from FMD outbreaks (routine surveillance that is undertaken in countries that are FMD-free without vaccination is not shown). (https://www.foot-and-mouth.org/Ref-Lab-Network/Network-Annual-Meeting). *NB: Samples collected due to FMD incursions into Germany, Hungary and Slovakia are not shown.*
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, **Error! Reference source not found.**).

Table 1: Conjectured relative prevalence of circulating FMD viral lineages in each Pool (last updated October 2025). These scores can be used to inform the PRAGMATIST tool (see Annex 3:).

Lineage	South-east / 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			25					
O/ME-SA PanAsia	10							
O/SEA Mya-98	15							
O/ME-SA Ind2001	43	21	3	0				
O/ME-SA/SA-2018		61	13					
O/EA or O/WA			1	58	62.5	60	16	
O/EURO-SA						0		90
O/CATHAY	17							
A/ASIA Sea-97	15							
A/ASIA Iran-05	0	0	20					
A/ASIA G-VII		15	0					
A /AFRICA				24	12	15		
A/EURO-SA				2				10
Asia1	0	3	5					
SAT 1			21	4	15	1	8	
SAT 2			12	12	10	24	57	
SAT 3					0.5		19	
C								

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 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-2025.

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 October - December 2025 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 October - December 2025.

WRLFMD Batch No.	Date received	Country	Total No. samples	Serotype	No. of samples	No. of sequences	Sequencing status
WRLFMD/2025/000016	11/09/2025	Ethiopia	72	O A SAT 2	46 2 1	46 2 1	Finished
WRLFMD/2025/000017	07/11/2025	Kenya	119	O A SAT 1 SAT 2	16 3 10 6		In Progress
WRLFMD/2025/000018	04/12/2023	Egypt	4	A SAT 1	1 1	1 1	Finished
Totals			**195**		**86**	**51**	

Table 3: VP1 sequences submitted by other FMD laboratories to the WRLFMD from October - December 2025.

WRLFMD Batch No.	Date received	Country	Serotype	Date Collected	No. of sequences	Submitting laboratory
WRLMEG/2025/000036	07/11/2025	Turkey	SAT 1	01/05/2025	1	Şap Enstitüsü, Türkiye
WRLMEG/2025/000037	19/11/2025	Iran	SAT 1	2025	1	Via GenBank (not official)
				Total	**4**	

4. Detailed analysis

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

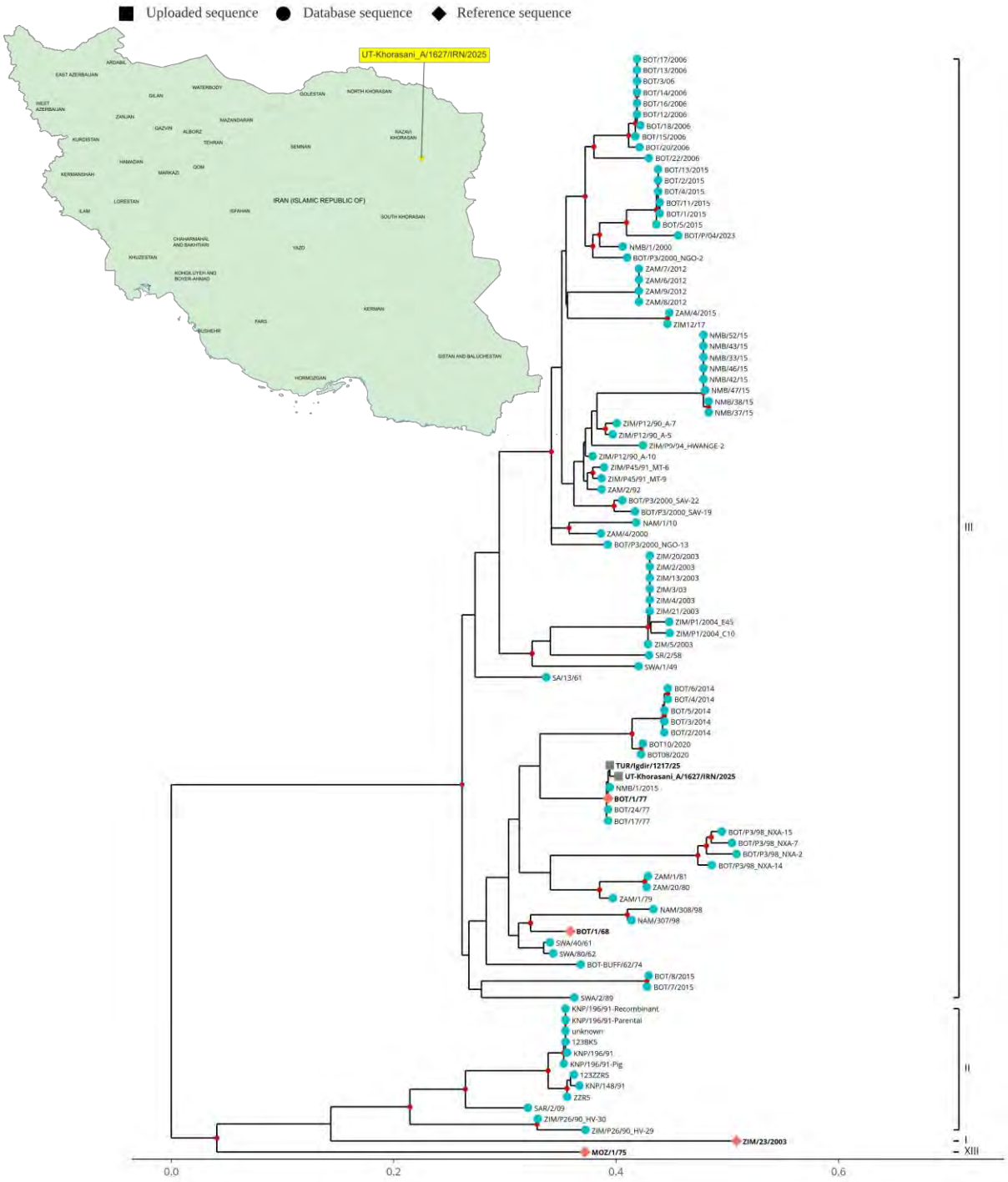
No samples/sequences received.

4.2. Pool 2 (South Asia)

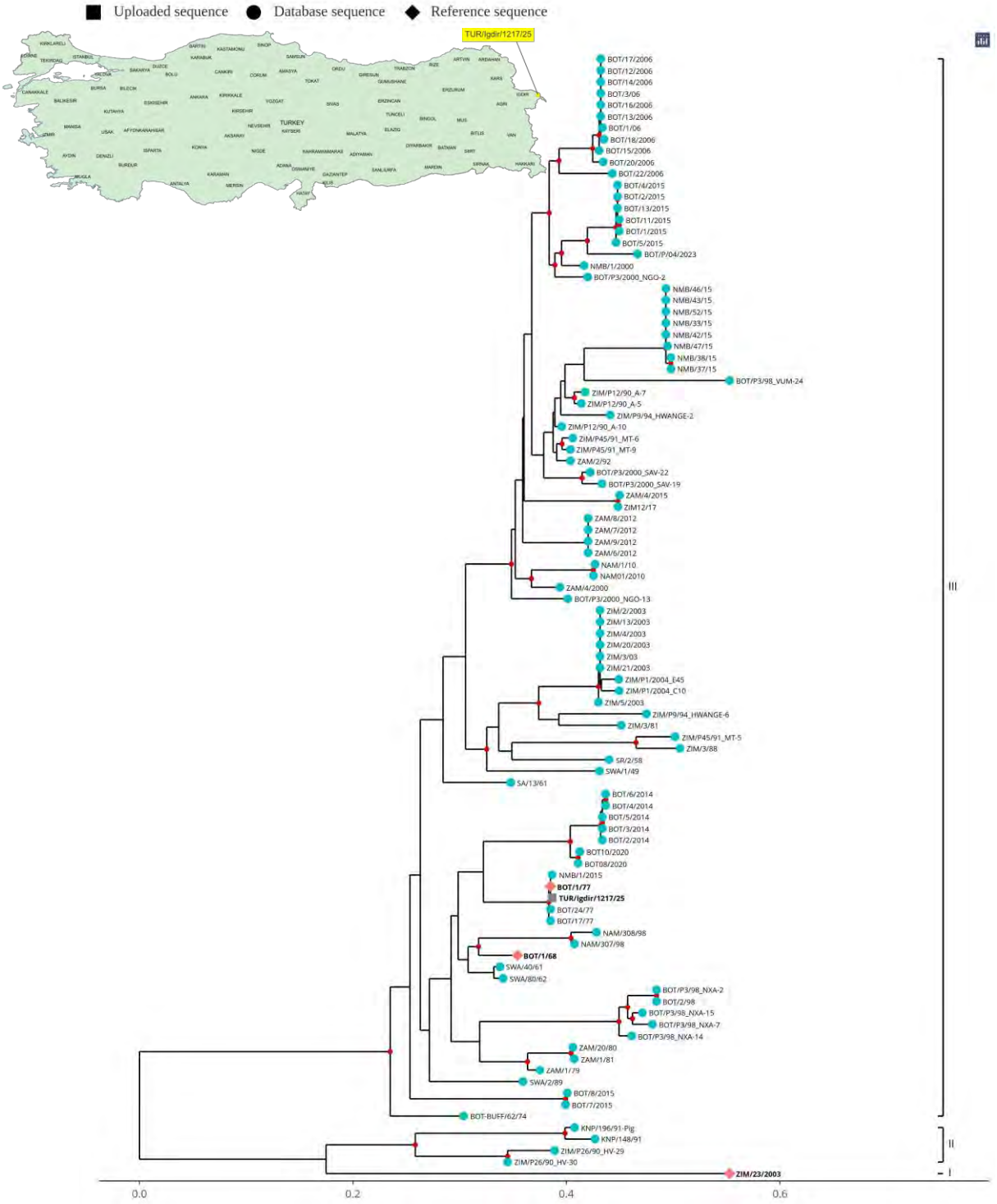
No samples/sequences received.

4.1. Pool 3 (West Eurasia and Near East)

The Islamic Republic of Iran	
Batch:	WRLMEG/2025/000037
Samples/sequences provided by:	From GenBank (not official)
Date Received:	19 November 2025
Number Of Samples:	1
SAT 1 (SAT 1/III (WZ))	1

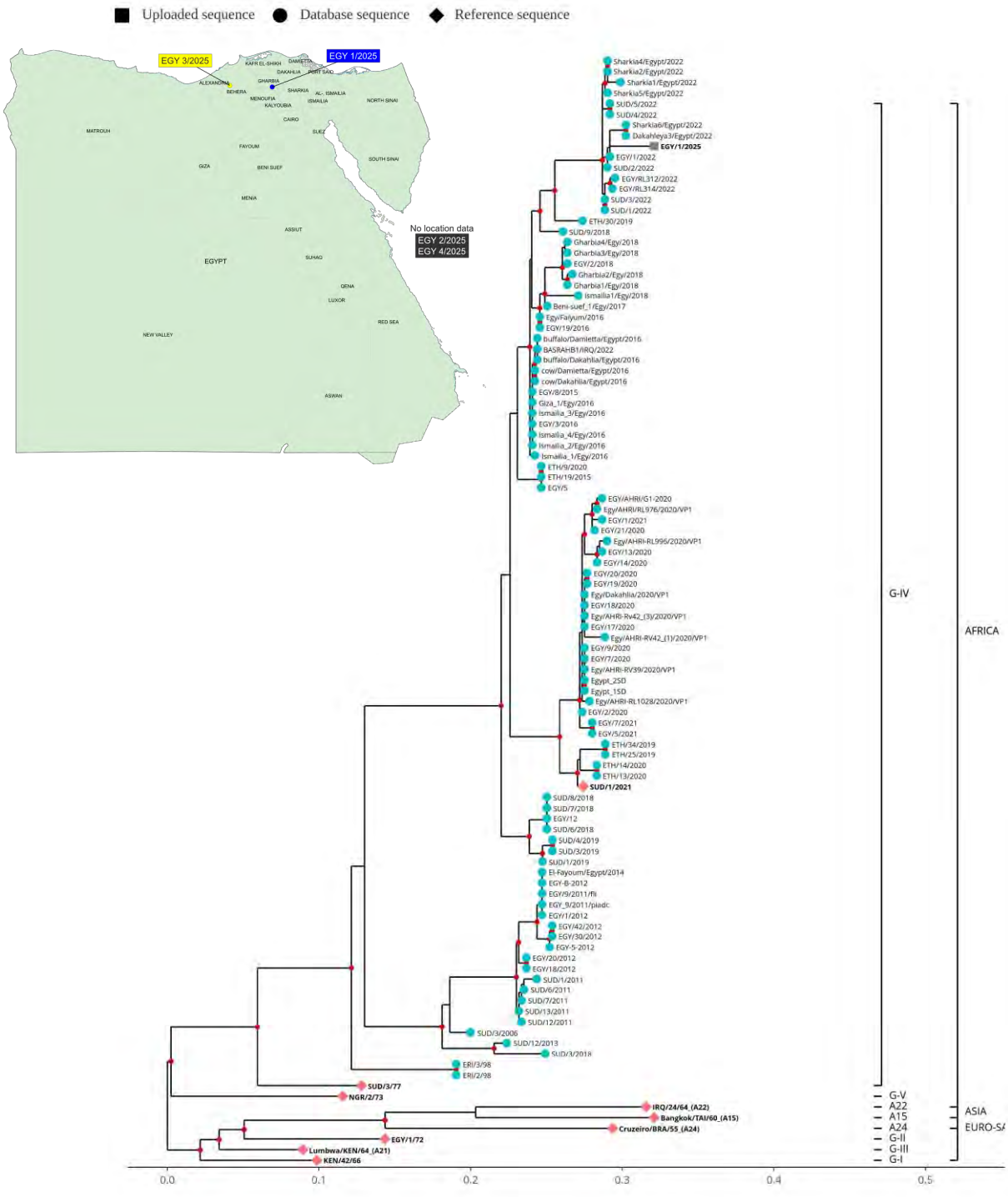


The Republic of Türkiye	
Batch:	WRLMEG/2025/000036
Samples/sequences provided by:	Şap Enstitüsü, Türkiye
Date Received:	7 November 2025
Number Of Samples:	1
SAT 1 (SAT 1/III (WZ))	1

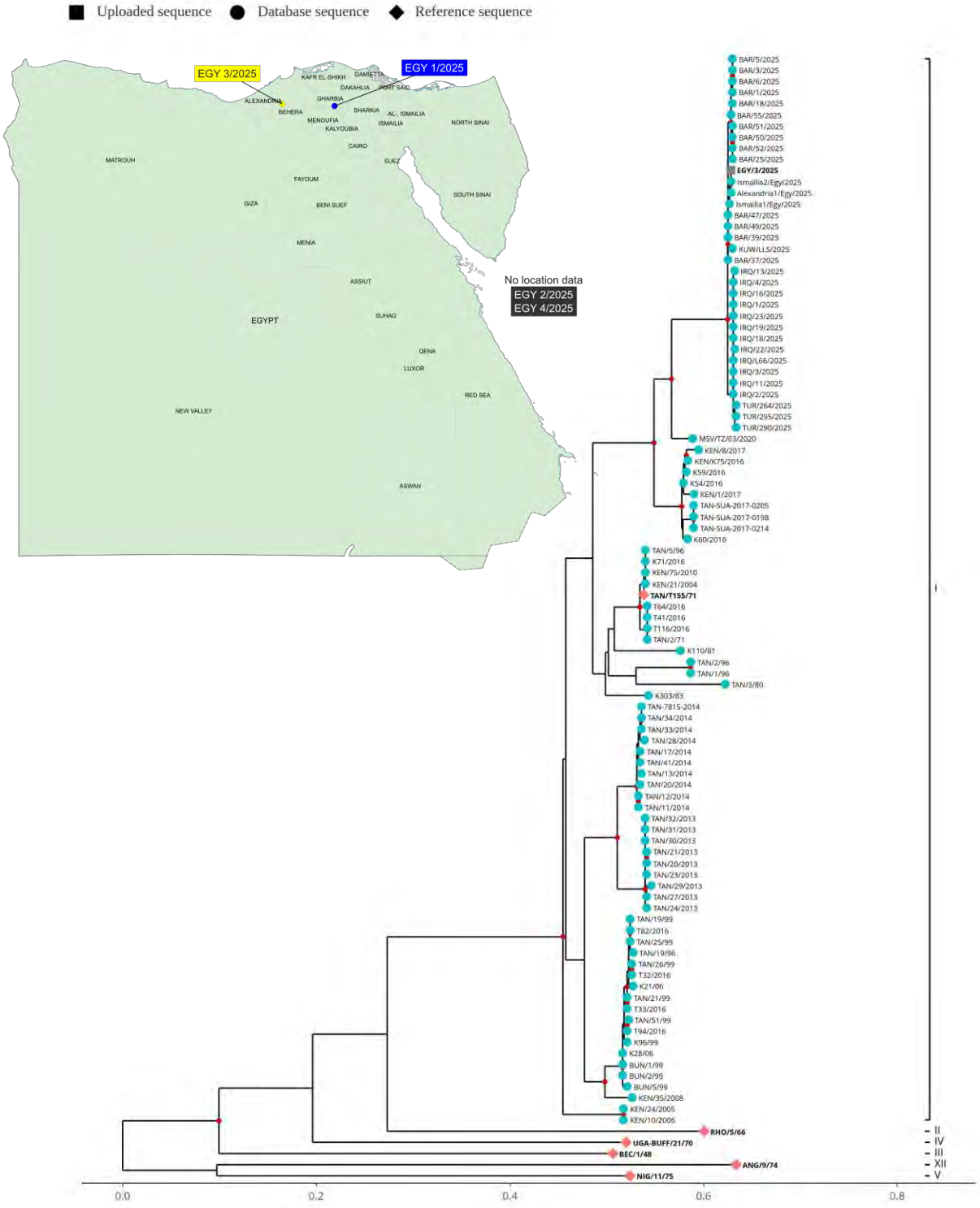


4.2. Pool 4 (North and East Africa)

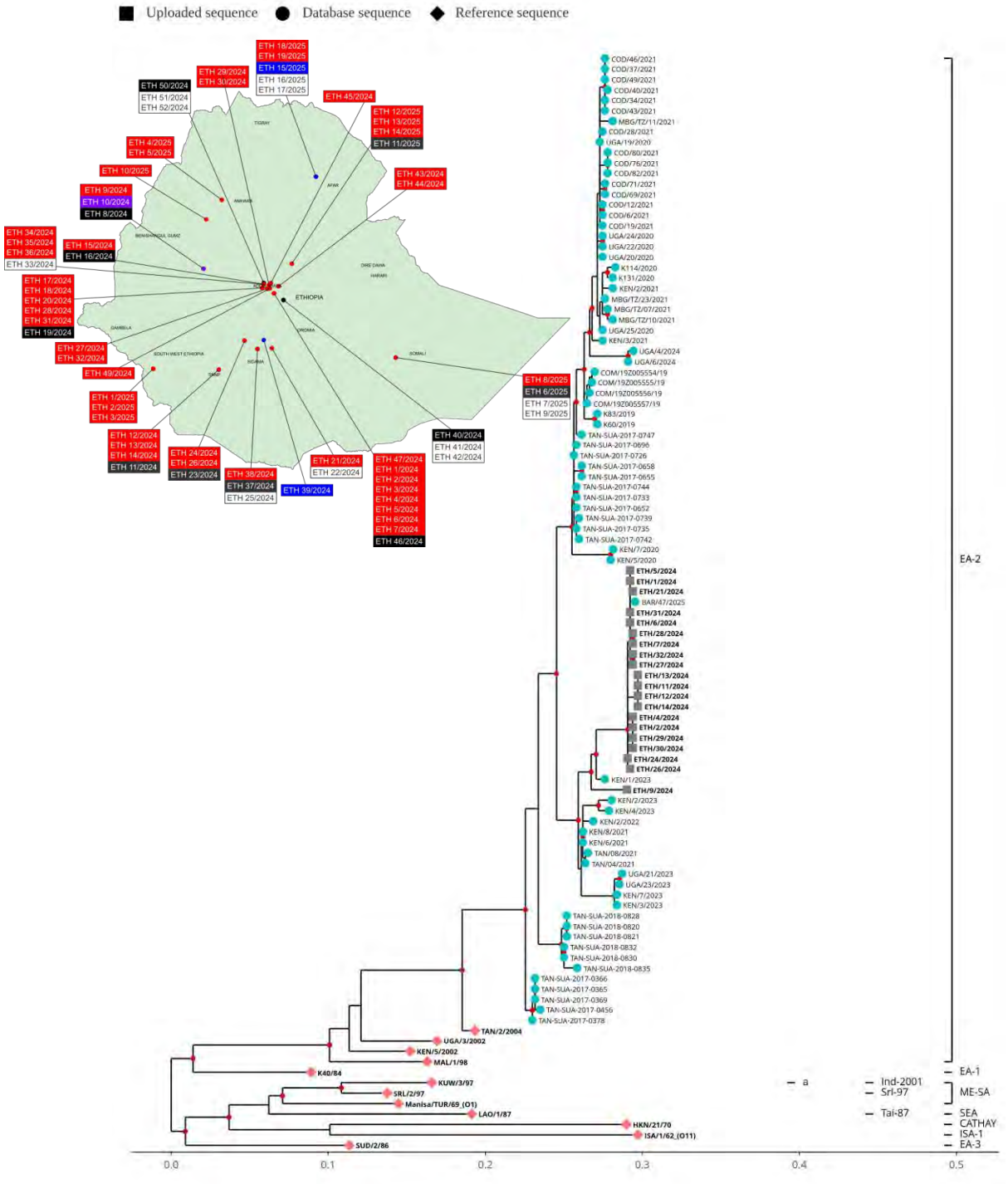
The Arab Republic of Egypt	
Batch:	WRLFMD/2025/000018
Samples/sequences provided by:	AHRI, Egypt
Date Received:	4 December 2025
Number Of Samples:	1
A (A/G-IV)	1

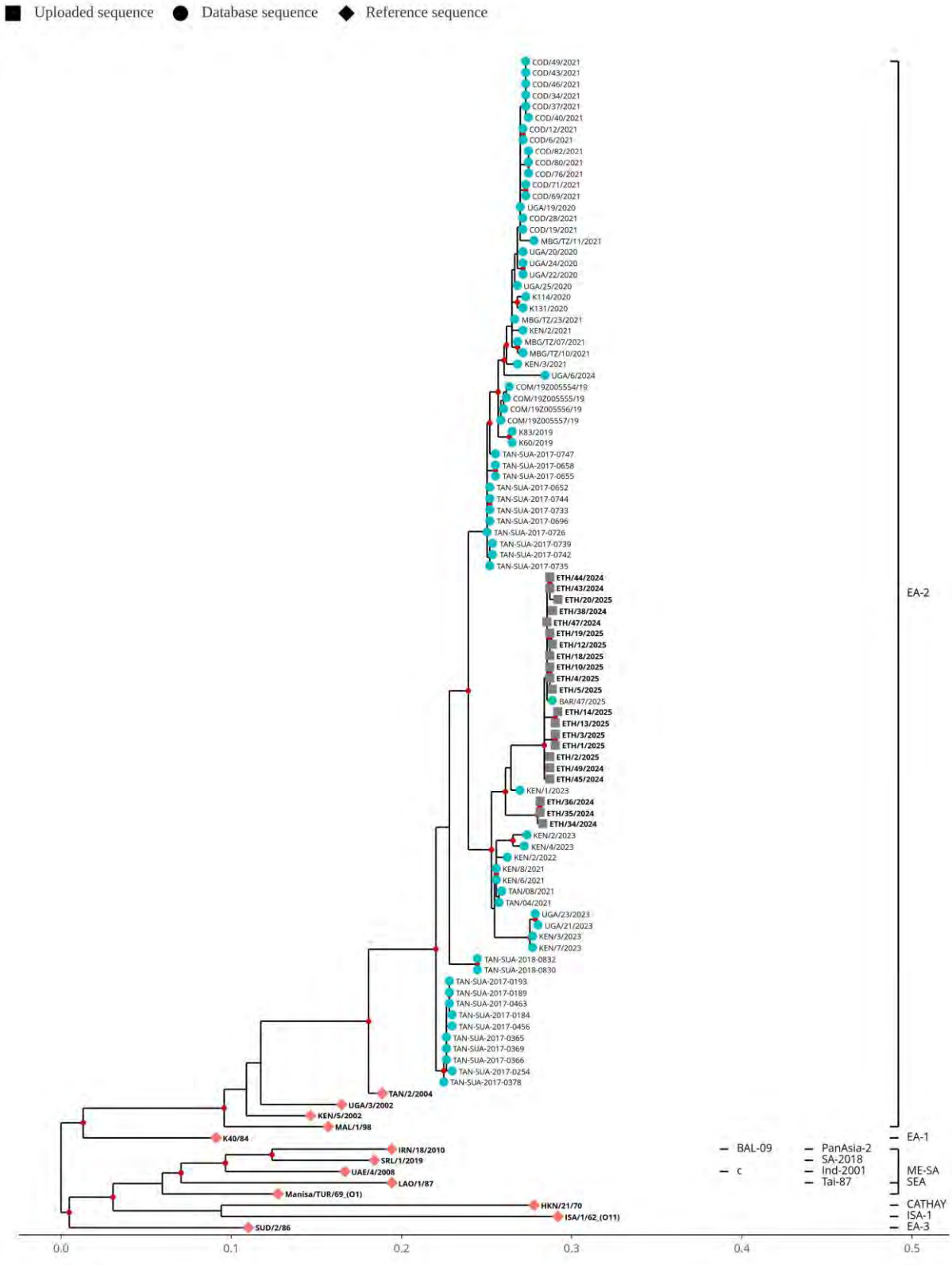


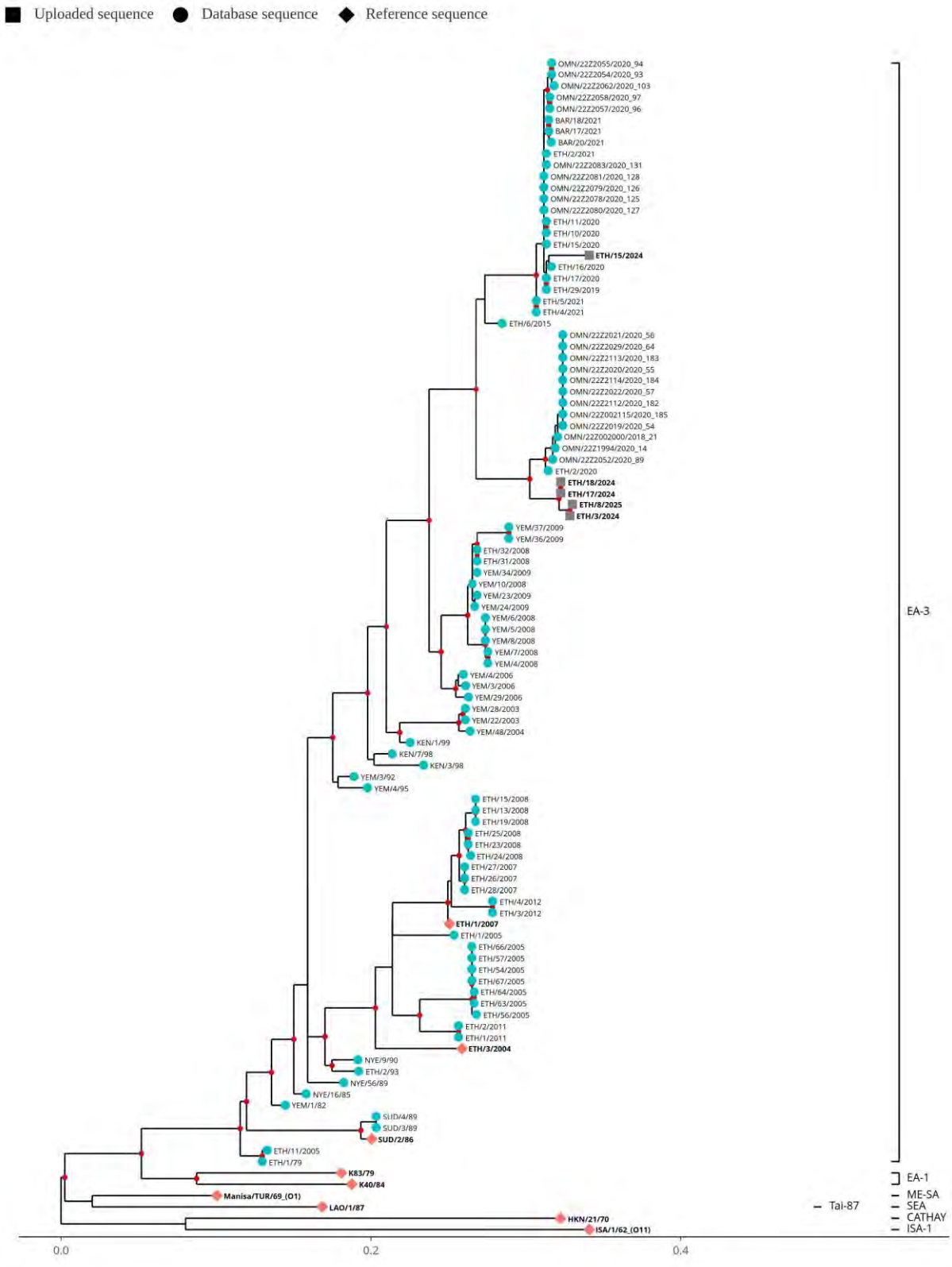
The Arab Republic of Egypt	
Batch:	WRLFMD/2025/000018
Samples/sequences provided by:	AHRI, Egypt
Date Received:	4 December 2025
Number Of Samples:	1
SAT 1 (SAT 1/I) - (NWZ))	1



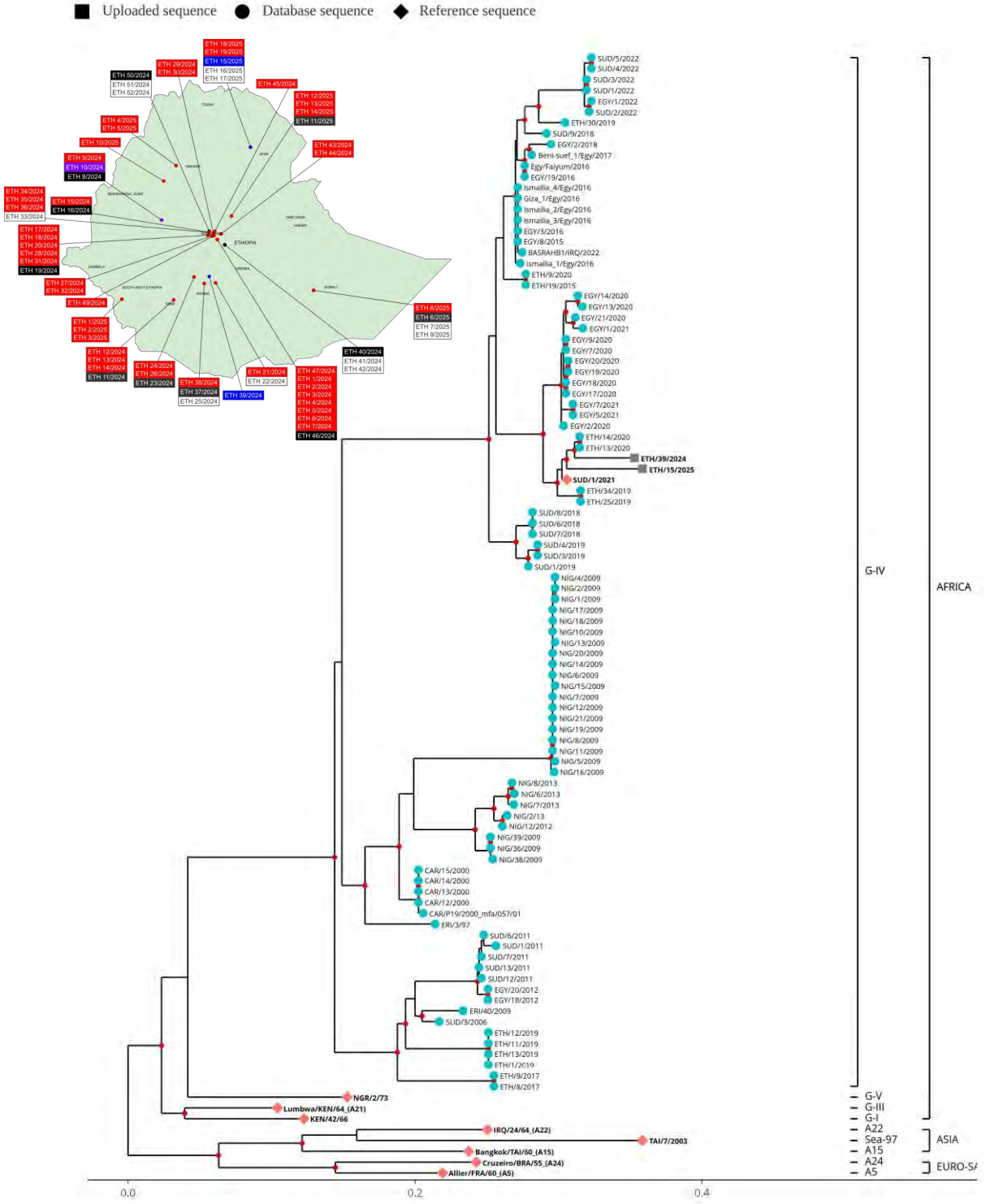
The Federal Democratic Republic of Ethiopia	
Batch:	WRLFMD/2025/000016
Samples/sequences provided by:	NAHDIC, Ethiopia
Date Received:	11 September 2025
Number Of Samples:	46
O (O/EA-2)	41 (over two trees below)
O (O/EA-3)	5



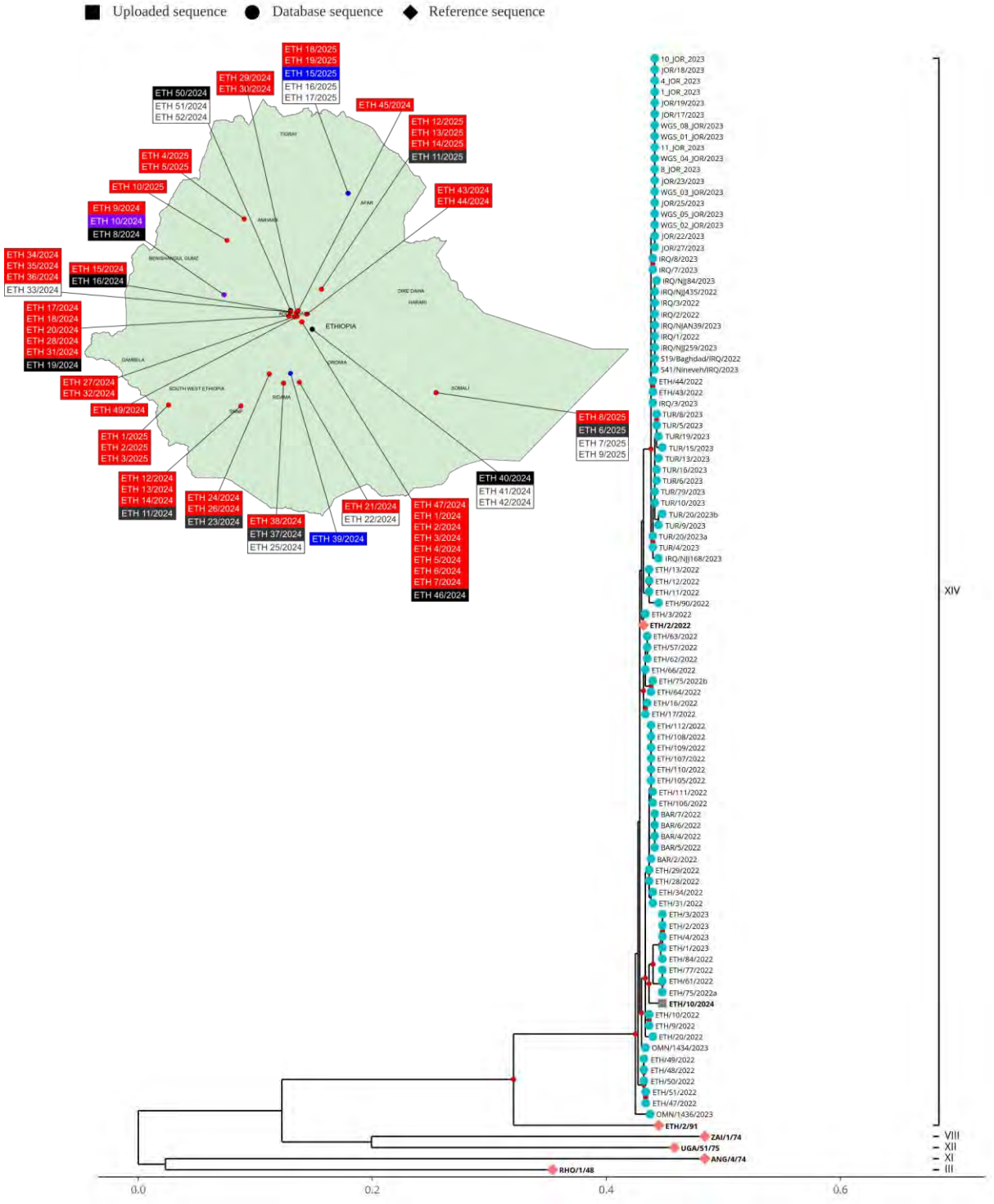

Uploaded sequence
Database sequence
Reference sequence
COD/49/2021
COD/43/2021
COD/46/2021
COD/34/2021
COD/37/2021
COD/40/2021
COD/12/2021
COD/6/2021
COD/82/2021
COD/80/2021
COD/76/2021
COD/71/2021
COD/69/2021
UGA/19/2020
COD/28/2021
COD/19/2021
MBG/TZ/11/2021
UGA/20/2020
UGA/24/2020
UGA/22/2020
UGA/25/2020
K114/2020
K131/2020
MBG/TZ/23/2021
KEN/2/2021
MBG/TZ/07/2021
MBG/TZ/10/2021
KEN/3/2021
UGA/6/2024
COM/19Z005554/19
COM/19Z005555/19
COM/19Z005556/19
COM/19Z005557/19
K83/2019
K60/2019
TAN-SUA-2017-0747
TAN-SUA-2017-0658
TAN-SUA-2017-0655
TAN-SUA-2017-0652
TAN-SUA-2017-0744
TAN-SUA-2017-0733
TAN-SUA-2017-0696
TAN-SUA-2017-0726
TAN-SUA-2017-0739
TAN-SUA-2017-0742
TAN-SUA-2017-0735
ETH/44/2024
ETH/43/2024
ETH/20/2025
ETH/38/2024
ETH/47/2024
ETH/19/2025
ETH/12/2025
ETH/18/2025
ETH/10/2025
ETH/4/2025
ETH/5/2025
BAR/47/2025
ETH/14/2025
ETH/13/2025
ETH/3/2025
ETH/1/2025
ETH/2/2025
ETH/49/2024
ETH/45/2024
KEN/1/2023
ETH/36/2024
ETH/35/2024
ETH/34/2024
KEN/2/2023
KEN/4/2023
KEN/2/2022
KEN/8/2021
KEN/6/2021
TAN/08/2021
TAN/04/2021
UGA/23/2023
UGA/21/2023
KEN/3/2023
KEN/7/2023
TAN-SUA-2018-0832
TAN-SUA-2018-0830
TAN-SUA-2017-0193
TAN-SUA-2017-0189
TAN-SUA-2017-0463
TAN-SUA-2017-0184
TAN-SUA-2017-0456
TAN-SUA-2017-0365
TAN-SUA-2017-0369
TAN-SUA-2017-0366
TAN-SUA-2017-0254
TAN-SUA-2017-0378
TAN/2/2004
UGA/3/2002
KEN/5/2002
MAL/1/98
K40/84
IRN/18/2010
SRL/1/2019
UAE/4/2008
LAO/1/87
Manisa/TUR/69_(O1)
HKN/21/70
ISA/1/62_(O11)
SUD/2/86
EA-2
EA-1
BAL-09
c
PanAsia-2
SA-2018
Ind-2001
Tai-87
ME-SA
SEA
CATHAY
ISA-1
EA-3
0.0
0.1
0.2
0.3
0.4
0.5


Uploaded sequence
Database sequence
Reference sequence
OMN/22Z2055/2020_94
OMN/22Z2054/2020_93
OMN/2222062/2020_103
OMN/22Z2058/2020_97
OMN/2222057/2020_96
BAR/18/2021
BAR/17/2021
BAR/20/2021
ETH/2/2021
OMN/22Z2083/2020_131
OMN/22Z2081/2020_128
OMN/22Z2079/2020_126
OMN/22Z2078/2020_125
OMN/22Z2080/2020_127
ETH/11/2020
ETH/10/2020
ETH/15/2020
ETH/15/2024
ETH/16/2020
ETH/17/2020
ETH/29/2019
ETH/5/2021
ETH/4/2021
ETH/6/2015
OMN/22Z2021/2020_56
OMN/22Z2029/2020_64
OMN/22Z2113/2020_183
OMN/22Z2020/2020_55
OMN/22Z2114/2020_184
OMN/22Z2022/2020_57
OMN/22Z2112/2020_182
OMN/22Z002115/2020_185
OMN/22Z2019/2020_54
OMN/22Z002000/2018_21
OMN/22Z1994/2020_14
OMN/22Z2052/2020_89
ETH/2/2020
ETH/18/2024
ETH/17/2024
ETH/8/2025
ETH/3/2024
YEM/37/2009
YEM/36/2009
ETH/32/2008
ETH/31/2008
YEM/34/2009
YEM/10/2008
YEM/23/2009
YEM/24/2009
YEM/6/2008
YEM/5/2008
YEM/8/2008
YEM/7/2008
YEM/4/2008
YEM/4/2006
YEM/3/2006
YEM/29/2006
YEM/28/2003
YEM/22/2003
YEM/48/2004
KEN/1/99
KEN/7/98
KEN/3/98
YEM/3/92
YEM/4/95
ETH/15/2008
ETH/13/2008
ETH/19/2008
ETH/25/2008
ETH/23/2008
ETH/24/2008
ETH/27/2007
ETH/26/2007
ETH/28/2007
ETH/4/2012
ETH/3/2012
ETH/1/2007
ETH/1/2005
ETH/66/2005
ETH/57/2005
ETH/54/2005
ETH/67/2005
ETH/64/2005
ETH/63/2005
ETH/56/2005
ETH/2/2011
ETH/1/2011
ETH/3/2004
NYE/9/90
ETH/2/93
NYE/56/89
NYE/16/85
YEM/1/82
SUD/4/89
SUD/3/89
SUD/2/86
ETH/11/2005
ETH/1/79
K83/79
K40/84
Manisa/TUR/69_(O1)
LAO/1/87
HKN/21/70
ISA/1/62_(O11)
Tai-87
EA-3
EA-1
ME-SA
SEA
CATHAY
ISA-1
0.0
0.2
0.4

The Federal Democratic Republic of Ethiopia	
Batch:	WRLFMD/2025/000016
Samples/sequences provided by:	NAHDIC, Ethiopia
Date Received:	11 September 2025
Number Of Samples:	2
A (A/AFRICA/G-IV)	2



The Federal Democratic Republic of Ethiopia	
Batch:	WRLFMD/2025/000016
Samples/sequences provided by:	NAHDIC, Ethiopia
Date Received:	11 September 2025
Number Of Samples:	1
SAT 2 (SAT 2/XIV)	1



4.3. Pool 5 (West/Central Africa)

No samples/sequences received.

4.4. Pool 6 (Southern Africa)

No samples/sequences received.

4.5. Pool 7 (South America)

No samples/sequences received.

4.6. Vaccine matching

Antigenic characterisation of FMD field isolates by matching with vaccine strains by 2dmVNT from October - December 2025.

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[1]).
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
Nepal	3						
Total	**3**	**0**	**0**	**0**	**0**	**1**	**0**

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

[1] Brehm, *et al.* (2008). High potency vaccines induce protection against heterologous challenge with foot-and-mouth disease virus. *Vaccine*, **26**(13):1681-7. doi: 10.1016/j.vaccine.2008.01.038.

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_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*
NEP 34/2024	ME-SA	Ind-2001e	0.32	*1.52*	0.59	*2.47*	0.43	*2.00*	0.42	*1.86*	0.36	*1.89*
NEP 37/2024	ME-SA	Ind-2001e	0.40	*1.62*	0.41	*2.31*	0.47	*2.04*	0.38	*1.83*	0.37	*1.90*
NEP 45/2024	ME-SA	Ind-2001e	0.41	*1.75*	0.61	*2.58*	0.56	*2.14*	0.51	*2.07*	0.78	*2.17*

Annex 1: Sample data

Summary of submissions

Table 6: Summary of samples collected and received to WRLFMD October - December 2025

Country	Nº of samples	Virus isolation in cell culture/ELISA								RT-PCR for FMD	
		FMD virus serotypes							No Virus Detected		
		O	A	C	SAT 1	SAT 2	SAT 3	ASIA1		*Positive*	*Negative*
Ethiopia	72	46	2	0	0	1	0	0	12	60	12
Kenya*	119	16	3	0	0	0	0	0	69	50	69
Egypt	4	0	1	0	0	0	0	0	0	4	0
TOTAL	**195**	**62**	**6**	**0**	**0**	**1**	**0**	**0**	**81**	**114**	**81**

* Sequencing results will be included in the next Quarterly Report

Clinical samples

Table 7: Clinical sample diagnostics made by the WRLFMD October - December 2025

Country	Date		WRL for FMD Sample Identification	Animal	Date of Collection	Results		
	Received	Reported				VI/ELISA	RT-PCR	Final report
ETHIOPIA	11 Sep 2025	27 Oct 2025	ETH 1/2024	CATTLE	13 Jan 2024	O	FMDV GD	O
			ETH 2/2024	CATTLE	13 Jan 2024	O	FMDV GD	O
			ETH 3/2024	CATTLE	13 Jan 2024	O	FMDV GD	O
			ETH 4/2024	CATTLE	13 Jan 2024	O	FMDV GD	O
			ETH 5/2024	CATTLE	13 Jan 2024	O	FMDV GD	O
			ETH 6/2024	CATTLE	13 Jan 2024	O	FMDV GD	O
			ETH 7/2024	CATTLE	13 Jan 2024	O	FMDV GD	O
			ETH 8/2024	CATTLE	25 Mar 2024	NVD	FMDV GD	FMDV GD
			ETH 9/2024	CATTLE	25 Mar 2024	O	FMDV GD	O
			ETH 10/2024	CATTLE	25 Mar 2024	SAT2	FMDV GD	SAT2
			ETH 11/2024	CATTLE	30 Mar 2024	O	FMDV GD	O
			ETH 12/2024	CATTLE	30 Mar 2024	O	FMDV GD	O
			ETH 13/2024	CATTLE	30 Mar 2024	O	FMDV GD	O
			ETH 14/2024	CATTLE	30 Mar 2024	O	FMDV GD	O
			ETH 15/2024	CATTLE	22 Jun 2024	O	FMDV GD	O
			ETH 16/2024	CATTLE	22 Jun 2024	NVD	FMDV GD	FMDV GD
			ETH 17/2024	CATTLE	27 Jul 2024	O	FMDV GD	O
			ETH 18/2024	CATTLE	27 Jul 2024	O	FMDV GD	O
			ETH 19/2024	CATTLE	27 Jul 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
			ETH 20/2024	CATTLE	27 Jul 2024	NVD	NGD	NVD
			ETH 21/2024	CATTLE	10 Oct 2024	O	FMDV GD	O
			ETH 22/2024	CATTLE	10 Oct 2024	NVD	NGD	NVD
			ETH 23/2024	CATTLE	13 Oct 2024	NVD	FMDV GD	FMDV GD
			ETH 24/2024	CATTLE	13 Oct 2024	O	FMDV GD	O
			ETH 25/2024	CATTLE	13 Oct 2024	NVD	NGD	NVD
			ETH 26/2024	CATTLE	13 Oct 2024	O	FMDV GD	O
			ETH 27/2024	CATTLE	18 Oct 2024	O	FMDV GD	O
			ETH 28/2024	CATTLE	18 Oct 2024	O	FMDV GD	O
			ETH 29/2024	CATTLE	18 Oct 2024	O	FMDV GD	O
			ETH 30/2024	CATTLE	18 Oct 2024	O	FMDV GD	O
			ETH 31/2024	CATTLE	18 Oct 2024	O	FMDV GD	O
			ETH 32/2024	CATTLE	18 Oct 2024	O	FMDV GD	O
			ETH 33/2024	CATTLE	29 Oct 2024	NVD	NGD	NVD
			ETH 34/2024	CATTLE	29 Oct 2024	O	FMDV GD	O
			ETH 35/2024	CATTLE	29 Oct 2024	O	FMDV GD	O
			ETH 36/2024	CATTLE	29 Oct 2024	O	FMDV GD	O
			ETH 37/2024	CATTLE	03 Nov 2024	NVD	FMDV GD	FMDV GD
			ETH 38/2024	CATTLE	03 Nov 2024	O	FMDV GD	O
			ETH 39/2024	CATTLE	03 Nov 2024	A	FMDV GD	A
			ETH 40/2024	CATTLE	15 Nov 2024	NVD	FMDV GD	FMDV GD
			ETH 41/2024	CATTLE	15 Nov 2024	NVD	NGD	NVD
			ETH 42/2024	CATTLE	15 Nov 2024	NVD	NGD	NVD
			ETH 43/2024	CATTLE	15 Nov 2024	O	FMDV GD	O
			ETH 44/2024	CATTLE	15 Nov 2024	O	FMDV GD	O
			ETH 45/2024	CATTLE	20 Nov 2024	O	FMDV GD	O
			ETH 46/2024	CATTLE	01 Dec 2024	NVD	FMDV GD	FMDV GD
			ETH 47/2024	CATTLE	01 Dec 2024	O	FMDV GD	O
			ETH 48/2024	CATTLE	01 Dec 2024	NVD	FMDV GD	FMDV GD
			ETH 49/2024	CATTLE	01 Dec 2024	O	FMDV GD	O
			ETH 50/2024	CATTLE	10 Dec 2024	NVD	FMDV GD	FMDV GD
			ETH 51/2024	CATTLE	10 Dec 2024	NVD	NGD	NVD
			ETH 52/2024	CATTLE	10 Dec 2024	NVD	NGD	NVD
			ETH 1/2025	CATTLE	08 Jan 2025	O	FMDV GD	O
			ETH 2/2025	CATTLE	08 Jan 2025	O	FMDV GD	O
			ETH 3/2025	CATTLE	08 Jan 2025	O	FMDV GD	O
			ETH 4/2025	CATTLE	18 Jan 2025	O	FMDV GD	O
			ETH 5/2025	CATTLE	18 Jan 2025	O	FMDV GD	O
			ETH 6/2025	CATTLE	22 Jan 2025	NVD	FMDV GD	FMDV GD
			ETH 7/2025	CATTLE	22 Jan 2025	NVD	NGD	NVD

Country	Date		WRL for FMD Sample Identification	Animal	Date of Collection	Results		
	Received	Reported				VI/ELISA	RT-PCR	Final report
			ETH 8/2025	CATTLE	22 Jan 2025	O	FMDV GD	O
			ETH 9/2025	CATTLE	22 Jan 2025	NVD	NGD	NVD
			ETH 10/2025	CATTLE	11 Feb 2025	O	FMDV GD	O
			ETH 11/2025	CATTLE	22 Feb 2025	NVD	FMDV GD	FMDV GD
			ETH 12/2025	CATTLE	22 Feb 2025	O	FMDV GD	O
			ETH 13/2025	CATTLE	22 Feb 2025	O	FMDV GD	O
			ETH 14/2025	CATTLE	22 Feb 2025	O	FMDV GD	O
			ETH 15/2025	CATTLE	12 Jun 2025	A	FMDV GD	A
			ETH 16/2025	CATTLE	12 Jun 2025	NVD	NGD	NVD
			ETH 17/2025	CATTLE	12 Jun 2025	NVD	NGD	NVD
			ETH 18/2025	CATTLE	12 Jun 2025	O	FMDV GD	O
			ETH 19/2025	CATTLE	12 Jun 2025	O	FMDV GD	O
			ETH 20/2025	CATTLE	28 Jul 2025	O	FMDV GD	O
KENYA	07 Nov 2025	18 Dec 2025	KEN 1/1971	BOVINE	27 Jul 1971	SAT1	FMDV GD	SAT1
			KEN 1/1978	BOVINE	19 Jul 1978	O	FMDV GD	O
			KEN 1/1980	BOVINE	09 Jan 1980	A	FMDV GD	A
			KEN 3/1984	BOVINE	22 May 1984	SAT2	FMDV GD	SAT2
			KEN 8/2023	BOVINE	16 Aug 2023	NVD	FMDV GD	FMDV GD
			KEN 9/2023	BOVINE	17 Aug 2023	O	FMDV GD	O
			KEN 10/2023	BOVINE	06 Sep 2023	A	FMDV GD	A
			KEN 11/2023	BOVINE	01 Nov 2023	NVD	FMDV GD	FMDV GD
			KEN 12/2023	BOVINE	27 Dec 2023	NVD	FMDV GD	FMDV GD
			KEN 1/2024	BOVINE	15 Jan 2024	O	FMDV GD	O
			KEN 2/2024	BOVINE	20 Jan 2024	NVD	FMDV GD	FMDV GD
			KEN 3/2024	BOVINE	29 Feb 2024	SAT2	FMDV GD	SAT2
			KEN 4/2024	BOVINE	15 Mar 2024	NVD	NGD	NVD
			KEN 5/2024	BOVINE	25 Mar 2024	NVD	NGD	NVD
			KEN 6/2024	BOVINE	12 Apr 2024	O	FMDV GD	O
			KEN 7/2024	BOVINE	17 May 2024	NVD	NGD	NVD
			KEN 8/2024	BOVINE	17 May 2024	NVD	NGD	NVD
			KEN 9/2024	BOVINE	17 May 2024	NVD	FMDV GD	FMDV GD
			KEN 10/2024	BOVINE	27 May 2024	O	FMDV GD	O
			KEN 11/2024	BOVINE	10 Jun 2024	NVD	FMDV GD	FMDV GD
			KEN 12/2024	BOVINE	10 Jun 2024	NVD	NGD	NVD
			KEN 13/2024	BOVINE	11 Aug 2024	NVD	NGD	NVD
			KEN 14/2024	BOVINE	19 Aug 2024	NVD	FMDV GD	FMDV GD
			KEN 15/2024	BOVINE	23 Aug 2024	O	FMDV GD	O
			KEN 16/2024	BOVINE	20 Sep 2024	A	FMDV GD	A
			KEN 17/2024	BOVINE	30 Dec 2024	SAT1	FMDV GD	SAT1
			KEN 1/2025	BOVINE	16 Jan 2025	SAT1	FMDV GD	SAT1

Country	Date		WRL for FMD Sample Identification	Animal	Date of Collection	Results		
	Received	Reported				VI/ELISA	RT-PCR	Final report
			KEN 2/2025	BOVINE	22 Jan 2025	O	FMDV GD	O
			KEN 3/2025	BOVINE	23 Jan 2025	NVD	FMDV GD	FMDV GD
			KEN 4/2025	BOVINE	02 Feb 2025	NVD	FMDV GD	FMDV GD
			KEN 5/2025	BOVINE	04 Feb 2025	NVD	NGD	NVD
			KEN 6/2025	BOVINE	04 Feb 2025	NVD	FMDV GD	FMDV GD
			KEN 7/2025	BOVINE	06 Feb 2025	NVD	NGD	NVD
			KEN 8/2025	BOVINE	11 Feb 2025	SAT1	FMDV GD	SAT1
			KEN 9/2025	BOVINE	12 Feb 2025	NVD	FMDV GD	FMDV GD
			KEN 10/2025	BOVINE	13 Feb 2025	SAT2	FMDV GD	SAT2
			KEN 11/2025	BOVINE	13 Feb 2025	SAT2	FMDV GD	SAT2
			KEN 12/2025	BOVINE	17 Feb 2025	SAT1	FMDV GD	SAT1
			KEN 13/2025	BOVINE	25 Feb 2025	O	FMDV GD	O
			KEN 14/2025	BOVINE	25 Feb 2025	NVD	NGD	NVD
			KEN 15/2025	BOVINE	25 Feb 2025	SAT2	FMDV GD	SAT2
			KEN 16/2025	BOVINE	26 Feb 2025	SAT1	FMDV GD	SAT1
			KEN 17/2025	BOVINE	11 Mar 2025	SAT1	FMDV GD	SAT1
			KEN 18/2025	BOVINE	07 Apr 2025	SAT1	FMDV GD	SAT1
			KEN 19/2025	BOVINE	30 Apr 2025	NVD	FMDV GD	FMDV GD
			KEN 20/2025	BOVINE	14 May 2025	NVD	FMDV GD	FMDV GD
			KEN 21/2025	BOVINE	15 May 2025	SAT1	FMDV GD	SAT1
			KEN 22/2025	BOVINE	17 May 2025	NVD	NGD	NVD
			KEN 23/2025	BOVINE	20 May 2025	O	FMDV GD	O
			KEN 24/2025	BOVINE	03 Jun 2025	SAT1	FMDV GD	SAT1
			KEN 25/2025	BOVINE	09 Jun 2025	NVD	FMDV GD	FMDV GD
			KEN 26/2025	BOVINE	10 Jun 2025	SAT2	FMDV GD	SAT2
			KEN 27/2025	BOVINE	11 Jun 2025	NVD	NGD	NVD
			KEN 28/2025	BOVINE	11 Jun 2025	NVD	NGD	NVD
			KEN 29/2025	BOVINE	11 Jun 2025	NVD	NGD	NVD
			KEN 30/2025	BOVINE	11 Jun 2025	NVD	NGD	NVD
			KEN 31/2025	BOVINE	11 Jun 2025	NVD	NGD	NVD
			KEN 32/2025	BOVINE	11 Jun 2025	NVD	NGD	NVD
			KEN 33/2025	OVINE	11 Jun 2025	NVD	NGD	NVD
			KEN 34/2025	OVINE	11 Jun 2025	NVD	NGD	NVD
			KEN 35/2025	OVINE	11 Jun 2025	NVD	NGD	NVD
			KEN 36/2025	OVINE	11 Jun 2025	NVD	NGD	NVD
			KEN 37/2025	OVINE	11 Jun 2025	NVD	NGD	NVD
			KEN 38/2025	OVINE	11 Jun 2025	NVD	NGD	NVD
			KEN 39/2025	OVINE	12 Jun 2025	O	FMDV GD	O
			KEN 40/2025	BOVINE	17 Jun 2025	NVD	NGD	NVD
			KEN 41/2025	BOVINE	17 Jun 2025	NVD	NGD	NVD

Country	Date		WRL for FMD Sample Identification	Animal	Date of Collection	Results		
	Received	Reported				VI/ELISA	RT-PCR	Final report
			KEN 42/2025	BOVINE	17 Jun 2025	NVD	NGD	NVD
			KEN 43/2025	BOVINE	17 Jun 2025	NVD	NGD	NVD
			KEN 44/2025	BOVINE	17 Jun 2025	NVD	NGD	NVD
			KEN 45/2025	BOVINE	17 Jun 2025	NVD	NGD	NVD
			KEN 46/2025	BOVINE	17 Jun 2025	NVD	NGD	NVD
			KEN 47/2025	BOVINE	17 Jun 2025	NVD	NGD	NVD
			KEN 48/2025	BOVINE	17 Jun 2025	NVD	NGD	NVD
			KEN 49/2025	BOVINE	17 Jun 2025	NVD	NGD	NVD
			KEN 50/2025	BOVINE	17 Jun 2025	NVD	NGD	NVD
			KEN 51/2025	BOVINE	17 Jun 2025	NVD	NGD	NVD
			KEN 52/2025	BOVINE	17 Jun 2025	NVD	NGD	NVD
			KEN 53/2025	BOVINE	17 Jun 2025	NVD	NGD	NVD
			KEN 54/2025	BOVINE	17 Jun 2025	NVD	NGD	NVD
			KEN 55/2025	BOVINE	17 Jun 2025	NVD	NGD	NVD
			KEN 56/2025	BOVINE	17 Jun 2025	NVD	NGD	NVD
			KEN 57/2025	BOVINE	17 Jun 2025	NVD	NGD	NVD
			KEN 58/2025	BOVINE	17 Jun 2025	NVD	NGD	NVD
			KEN 59/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 60/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 61/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 62/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 63/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 64/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 65/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 66/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 67/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 68/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 69/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 70/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 71/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 72/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 73/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 74/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 75/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 76/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 77/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 78/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 79/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 80/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 81/2025	BOVINE	19 Jun 2025	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
			KEN 82/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 83/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 84/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 85/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 86/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 87/2025	BOVINE	19 Jun 2025	NVD	NGD	NVD
			KEN 88/2025	BOVINE	08 Jul 2025	O	FMDV GD	O
			KEN 89/2025	BOVINE	17 Jul 2025	O	FMDV GD	O
			KEN 90/2025	BOVINE	24 Jul 2025	O	FMDV GD	O
			KEN 91/2025	BOVINE	14 Aug 2025	O	FMDV GD	O
			KEN 92/2025	BOVINE	19 Aug 2025	O	FMDV GD	O
			KEN 93/2025	BOVINE	28 Aug 2025	O	FMDV GD	O
EGYPT	04 Dec 2025	15 Dec 2024	EGY 1/2025	CATTLE	14 Apr 2025	A	FMDV GD	A
			EGY 2/2025	CATTLE	18 Jun 2025	NVD	FMDV GD	FMDV GD
			EGY 3/2025	BUFFALO	16 Jul 2025	SAT1	FMDV GD	SAT1
			EGY 4/2025	CATTLE	23 Jul 2025	NVD	FMDV GD	FMDV GD
Total			**195**					

Annex 2: FMD publications

Recent FMD Publications October - December 2025 cited by Web of Science.

1. (2025). Hungary FMD import ban lifted. *Veterinary Record*, **197**(7): 267-267.
2. (2025). Single-cell RNA sequencing reveals T and B cell-related immune features in *foot-and-mouth disease virus*-infected mice. *Virulence*, **16**(1): 26. DOI: 10.1080/21505594.2025.2580141.
3. (2025). FMD cases on the rise in the Middle East. *Veterinary Record*, **197**(10): 1.
4. Al-Mustapha, A.I., V. Adetunji, O.A. Ogundijo, I.A. Odetokun, L. Oyafajo, H.W. Abali, M. Oyewo, A.T. Abubakar, S.O. Muhammad, D.A. Adetunji, A. Odukoya, A. Haruna, F. Bamidele, N. Elelu, and F.O. Fasina (2025). Animal Disease Burden in Nigeria, 2006-2023. *Transboundary and Emerging Diseases*, **2025**(1): 14. DOI: 10.1155/tbed/1694850.
5. Alkhamis, M.A., H. Abouelhassan, A. Alateeqi, A. Husain, J.M. Humphreys, J. Arzt, and A.M. Perez (2025). Predicting the landscape epidemiology of foot-and-mouth disease in endemic regions: an interpretable machine learning approach. *Viruses-Basel*, **17**(10): 20. DOI: 10.3390/v17101383.
6. Araújo, E.L.M., I.M.P. Coelho, B.O.L. Ramos, L. Maia, and R.R. Nicolino (2026). Assessment of knowledge on foot-and-mouth disease in free zones where vaccination is not practiced in Brazil. *Preventive Veterinary Medicine*, **246**: 12. DOI: 10.1016/j.prevetmed.2025.106712.
7. Basher, M.A., T. Islam, S. Chakraborty, M.T. Hossain, and M.A. Islam (2025). Molecular detection and isolation of *Foot-and-mouth disease virus* from gayal and crossbreed cattle in two recent outbreaks in Bangladesh. *Discover Applied Sciences*, **7**(11): 11. DOI: 10.1007/s42452-025-07421-3.
8. Bayang, H.N., M.M.M. Mouliom, S.E. Mpouam, J.M.F. Kameni, F. Moffo, and J.P.M. Kilekoung (2025). Evaluation of direct economic losses due to foot-and-mouth disease reported by the epidemiological surveillance system in Cameroon from 2009 to 2023. *Veterinary Medicine and Science*, **11**(6): 7. DOI: 10.1002/vms3.70681.
9. Bellini, S., A. Scaburri, M. Tironi, V. Cappa, A. Mannelli, and G.L. Alborali (2025). Simulating the spread of foot-and-mouth disease in densely populated areas as part of contingency plans to establish the best control options. *Pathogens*, **14**(9): 13. DOI: 10.3390/pathogens14090933.
10. Blanco, E., E. Torres, P. de León, M. Forner, M.J. Bustos, S.E. Hammer, F. Sobrino, D. Andreu, and S. Defaus (2025). Single dose of foot-and-mouth disease peptide vaccine fully protects swine and achieves intraserotype crossed neutralization. *NPJ Vaccines*, **10**(1): 11. DOI: 10.1038/s41541-025-01274-y.
11. Britton, L.L., A.D. Hagerman, S.R. Mielke, C.P. Rigney, and A.H. Delgado (2025). Alternative foot-and-mouth disease eradication strategies in a large feedlot under resource limitations. *Journal of Agricultural and Resource Economics*, **50**(1): 24. DOI: 10.22004/ag.econ.344681.
12. Cao, W.J., J.W. Li, F. Yang, Z.X. Zhu, W. Zhang, H.X. Zheng, and Y.M. Wei (2025). Comparative investigation into the immune efficiency of the single intradermal and intramuscular delivery of foot-and-mouth disease inactivated vaccine in swine. *Virus Research*, **361**: 7. DOI: 10.1016/j.virusres.2025.199656.
13. Cardenas, N.C., D.V.D. Santos, D.M. Lima, H.O.D. Gutierrez, D.R.G. Vaca, and G. Machado (2025). Foot-and-mouth disease in Bolivia: simulation-based assessment of control strategies and

vaccination requirements. *Transboundary and Emerging Diseases*, **2025**(1): 10. DOI: 10.1155/tbed/9055612.

14. Dalal, P., S. Dahiya, A. Lather, D. Sheoran, P. Sangwan, N. Rani, A. Pannu, P. Kumar, P. Kumar, S. Subramaniam, and R.P. Singh (2025). VP1 region-based molecular characterization of *Foot-and-mouth disease virus* serotype O from clinical cases in Haryana, India. *BMC Veterinary Research*, **21**(1): 12. DOI: 10.1186/s12917-025-05112-0.

15. Das, L.J., G. Venkatesan, N. Krishnaswamy, I. Shekhawat, U. Vijayapillai, M. Priyanka, and H.J. Dechamma (2025). Effect of CRISPR-Cas9 mediated knockout of IRF3 gene in BHK-21 cells on immune gene expression and *Foot-and-mouth disease virus* replication. *Microbial Pathogenesis*, **208**: 7. DOI: 10.1016/j.micpath.2025.108022.

16. Das, L.J., G. Venkatesan, N. Krishnaswamy, P. Yadav, M.K.G. Pyatla, U. Vijayapillai, and D.H. J (2025). Kinetics of antiviral gene expression in *Foot-and-mouth disease virus* serotype O infected BHK-21 cells. *Brazilian Journal of Microbiology*, **57**(1): 6. DOI: 10.1007/s42770-025-01812-9.

17. Das, S., U. Nayak, S. Pal, and S. Subramaniam (2025). MolEpidPred: a novel computational solution for molecular epidemiology of *Foot-and-mouth disease virus* using VP1 nucleotide sequence data. *VirusDisease*, **36**(1): 1.

18. Elrashedy, A., W. Mousa, M. Nayel, A. Salama, A. Zaghawa, A. Elsify, and M.E. Hasan (2025). Systematic review and meta-analysis of the effectiveness of polypeptide, virus-like particles, and viral vector vaccines for foot-and-mouth disease (2020-2025). *Scientific Reports*, **15**(1): 16. DOI: 10.1038/s41598-025-24078-5.

19. Fish, I., C. Stenfeldt, U. Farooq, J. Humphreys, Z. Ahmed, and J. Arzt (2025). *Foot-and-mouth disease virus* variability and recombination on dairy farms in Pakistan. *Infection Genetics and Evolution*, **136**: 15. DOI: 10.1016/j.meegid.2025.105858.

20. Gao, Y.Y., Z.H. Zhang, C.J. Sang, Y. Han, Y.D. Cao, Y. Tang, G.X. Hu, Z.B. Li, and F.S. Gao (2025). A new strategy to identify naturally presenting SLA-I bound peptides derived from the O serotype of *Foot-and-mouth disease virus*, by mild acid elution in a VP1 stably expressed PK15 cell line. *Animals*, **15**(21): 18. DOI: 10.3390/ani15213097.

21. Gizaw, D., B. Senbata, A. Fentie, T. Bilata, D. Negessu, A. Muluneh, D. Shegu, H. Ashenafi, N.J. Knowles, J. Wadsworth, V. Mioulet, H.M. Hicks, M. Legesse, T. Kassa, and D.P. King (2025). Serotype diversity and molecular characterization of foot-and-mouth disease viruses from outbreaks in Ethiopia (2019-2023): re-emergence of SAT 2 after 30 years. *Transboundary and Emerging Diseases*, **2025**(1): 12. DOI: 10.1155/tbed/6670343.

22. Gray, A. (2025). Contaminated animal products likely cause of FMD. *Veterinary Record*, **196**(9): 1. DOI: 10.1002/vetr.5508.

23. Gunasekera, U., M.A. Fazi, C. Bartels, V. Punyapornwithaya, A. Perez, K. VanderWaal, and D.N. Makau (2026). Optimizing risk-based disease control strategies through network analysis: Case insights from FMD in Sri Lanka. *Preventive Veterinary Medicine*, **246**: 10. DOI: 10.1016/j.prevetmed.2025.106727.

24. Habtewold, W.T., N. Welde, A. Kenubih, Y.A. Getahun, T. Abayneh, B. Getachew, W. Woldemedhin, Y. Tesfaye, L. Tesfaw, Y. Getachew, and H. Negussie (2025). Effects of binary ethyleneimine and formaldehyde inactivation methods on *Foot-and-mouth disease virus* vaccine immune responses and kinetics. *Scientific Reports*, **15**(1): 9. DOI: 10.1038/s41598-025-01292-9.

25. Henning, A., L. Odendaal, A. Loots, and M.L.Y. Quan (2025). Demonstrating persistence of *Foot-and-mouth disease virus* in African buffalo (*Syncerus caffer*) using BaseScope™ *in situ* hybridisation. *Veterinary Research Communications*, **49**(6): 10. DOI: 10.1007/s11259-025-10898-3.

26. Huang, S.L., J.X. Yang, F.J. Li, H.H. Zhang, Y.M. Cao, J.J. Zha, H.F. Bao, P.H. Li, L.F. Liang, Z.X. Liu, K. Li, Z.J. Lu, J.L. Hua, and Q. Zhang (2025). Two residue mutations in VP1 of FMDV serotype A cause significant antigenic variation via reorientation of G-H loop revealed by lineage-specific neutralizing antibodies from the natural hosts. *Veterinary Microbiology*, **311**: 11. DOI: 10.1016/j.vetmic.2025.110748.

27. Hussain, S., Z.X. Jiang, H. Israr, J. Khan, M.N. Riaz, I. Ali, C.J. Wu, and P.T. Shah (2025). Recombination hotspots and genetic variability in *Foot-and-mouth disease virus* genomes: a comparative genomic and phylogeographic analysis. *Archives of Virology*, **171**(1): 13. DOI: 10.1007/s00705-025-06487-z.

28. Jabeen, U., K.S. Bisht, D.C. Nidhi, B.P. Sreenivasa, M. Hosamani, H.J. Dechamma, Bhanuprakash, A. Sanyal, P. Chaudhuri, and S.H. Basagoudanavar (2025). Evaluation of the DIVA compatibility and protective efficacy of negative marker vaccine for foot-and-mouth disease. *VirusDisease*, **36**(1): 2.

29. Kawaguchi, R., T. Nishi, K. Fukai, K.O. Lwin, and K. Morioka (2025). Phylogenetic characterization and pathogenicity in cattle and pigs of foot-and-mouth disease viruses circulating in Myanmar between 2016 and 2022. *Transboundary and Emerging Diseases*, **2025**(1): 13. DOI: 10.1155/tbed/1532487.

30. Kim, J.Y., S.Y. Park, G. Lee, S.H. Park, J.S. Jin, J.H. Park, and Y.J. Ko (2025). Construction of a full-length infectious clone derived from type O *Foot-and-mouth disease virus* isolated in South Korea for vaccine development with high antigen productivity. *Vaccines*, **13**(12): 15. DOI: 10.3390/vaccines13121195.

31. Kim, J.Y., S.Y. Park, G. Lee, S.H. Park, J.S. Jin, J.H. Park, and Y.J. Ko (2025). Characterization of a virus rescued from a full-length infectious clone derived from the type a *Foot-and-mouth disease virus* isolated in South Korea. *Viruses-Basel*, **17**(12): 13. DOI: 10.3390/v17121561.

32. Kishor, P.V., B.H.M. Patel, S. Banu, T.S.R. Periyasamy, H. Teggi, J. Sakthivel, A.M. Jayaprakash, D.H. Joyappa, M. Hosamani, P. Mahadappa, M. Singh, P. Chaudhuri, and N. Krishnaswamy (2025). Decay of maternal neutralizing antibodies against *Foot-and-mouth disease virus* (FMDV) in the calves born to the dam vaccinated for FMD during 80-110 days of gestation. *Veterinary Research Communications*, **49**(6): 7. DOI: 10.1007/s11259-025-10876-9.

33. Le, N.M.T., J. Chun, Y.H. Ko, and D.H. Kim (2025). Cell surface display of VP1 of *Foot-and-mouth disease virus* on *Saccharomyces cerevisiae*. *Microbial Cell Factories*, **24**(1): 11. DOI: 10.1186/s12934-025-02872-0.

34. Li, Q., X.F. Nian, X.F. Shang, Z.B. Zeng, Z.K. Luo, B. Du, M.H. Ma, Z.X. Zhu, F. Yang, J.J. Pei, W.J. Cao, H.B. Yan, L. Li, Y.G. Xu, X.S. Ma, and H.X. Zheng (2025). FMDV 3A cooperates with PDCD10 to promote FMDV replication by inhibiting VISA-mediated innate immunity. *Journal of Virology*: 21. DOI: 10.1128/jvi.00657-25.

35. Li, Z.Y., H. Dong, S.H. Yin, M.Y. Bai, Z.D. Teng, L.B. Chen, S.Y. Mu, Y. Zhang, Y.Z. Ding, S.Q. Sun, and H.C. Guo (2025). Glycosylated *Foot-and-mouth disease virus*-like particles produced in *Pichia pastoris* enhance stability and immunogenicity. *Microbial Biotechnology*, **18**(11): 14. DOI: 10.1111/1751-7915.70271.

36. Lv, B.N., X.R. Wang, Y. Zhou, Z.H. Su, Y.D. Sun, Y.Y. Yang, Y. Lu, Z.S. Pan, X.F. Tang, and C. Shen (2025). Composition, three-dimensional structure and formation mechanism of the *Foot-and-mouth disease virus* replication complexes. *Antiviral Research*, **244**: 16. DOI: 10.1016/j.antiviral.2025.106287.

37. Ma, K., R.Z. Hao, T.R. Liu, Y. Ru, T. Feng, X.L. Qi, Y.Z. Wang, B.Z. Lu, S. Wu, D. Li, R. Zhang, Y.F. Zhao, and H.X. Zheng (2025). Prolyl endopeptidase is a multifunctional host factor required for

FMDV infection. *Cellular and Molecular Life Sciences*, **82**(1): 20. DOI: 10.1007/s00018-025-05941-0.

38. Mahadappa, P., J. Pattar, B.R. Raghu, S. Rajesh, M.V. Kumar, A. Muthuswamy, V. Umapathi, H.J. Dechamma, N. Krishnaswamy, P. Chaudhuri, and B.H.M. Patel (2025). Foot-and-mouth disease adversely affects energy metabolism, surrogate indices of insulin resistance and milk yield till day 180 post-infection in the dairy cow. *Tropical Animal Health and Production*, **57**(8): 9. DOI: 10.1007/s11250-025-04704-0.

39. Makau, D.N., J. Arzt, and K. VanderWaal (2025). Tracing the spread and phylogeography of *Foot-and-mouth disease virus* across East and the Horn of Africa. *Virus Evolution*, **11**(1): 13. DOI: 10.1093/ve/veaf073.

40. Mamun, A.A., A. Karki, H.P. Panthi, N. Pandey, E. Mohtarima, and H.E.J. Jaoti (2025). Knowledge and practice in the assessment of frequent landscape diseases in cattle populations along the Madhumati River, Gopalganj, Bangladesh. *Veterinary Medicine and Science*, **11**(6): 7. DOI: 10.1002/vms3.70622.

41. Mfinanga, I.S., T. Marijani, and N.S. Mbare (2025). Modeling foot-and-mouth disease dynamics with immigrants and control in Tanzania. *Scientific African*, **30**: 17. DOI: 10.1016/j.sciaf.2025.e02974.

42. Mil-Homens, M.P., M. Arede, D. Beltrán-Alcrudo, M. Hovari, E. Raizman, and A.A. Palau (2025). Assessment of Foot-and-mouth disease trends in Türkiye Between 2005 and 2025. *Transboundary and Emerging Diseases*, **2025**(1): 12. DOI: 10.1155/tbed/2756250.

43. Mil-Homens, M.P., I.K.F. Georges, E. Raizman, D. Beltrán-Alcrudo, and A. Allepuz (2025). Biosecurity practices on small-ruminant farms in five Turkish provinces: a cross-sectional survey with multiple correspondence analysis. *Frontiers in Veterinary Science*, **12**: 11. DOI: 10.3389/fvets.2025.1677002.

44. Mohamadin, M., R. Manzoor, A. Elolimy, M. Abdelmegeid, S. Mosad, and S. Abd El Rahman (2025). Advancements in antiviral approaches against *Foot-and-mouth disease virus*: a comprehensive review (vol 12, 1574193, 2025). *Frontiers in Veterinary Science*, **12**: 1. DOI: 10.3389/fvets.2025.1683089.

45. Park, J.Y., H.M. Lee, K.J. Kang, M.K. Jung, J.Y. Mun, M.J. Kim, J.C. Pyun, S.Y. Hwang, J.H. Park, and H.J. Shin (2025). Development and immunogenicity of adenoviral Fc-fused FMDV virus-like particle vaccine in swine. *Veterinary Quarterly*, **45**(1): 18. DOI: 10.1080/01652176.2025.2564443.

46. Peng, M.Y., J.X. Li, F.P. Zhao, X. Ma, W. Cui, Y.P. Jiang, X.N. Wang, and L.J. Tang (2025). Global prevalence of swine *Foot-and-mouth disease virus*: a systematic review and meta-analysis. *Pakistan Veterinary Journal*, **45**(3): 1001-1008. DOI: 10.29261/pakvetj/2025.235.

47. Rahman, M.A., F. Zereen, M. Al-Amin, M.G. Hossain, J. Alam, M. Shimada, M.T. Rahman, and S. Saha (2025). Meta-analysis of genetic diversity of VP1 gene of *Foot-and-mouth disease virus* serotypes prevalent in Bangladesh from 2010 to 2024. *Infection Genetics and Evolution*, **135**: 11. DOI: 10.1016/j.meegid.2025.105835.

48. Ramya, K., S. Kishore, P. Sankar, G. Kondabatulla, B.M. Edao, R. Saravanan, and K. Karthik (2025). Inactivated type 'O' *Foot-and-mouth disease virus* encapsulated in chitosan nanoparticles induced protective immune response in guinea pigs. *Animals*, **15**(24): 21. DOI: 10.3390/ani15243540.

49. Rangga, P., I. MacPhillamy, S. Handaru, N. Matsumoto, E. Zalcman, and B. Madin (2026). A case report of the 2022 foot-and-mouth disease outbreaks in a sample of Indonesian feedlots. *Preventive Veterinary Medicine*, **246**: 5. DOI: 10.1016/j.prevetmed.2025.106739.

50. Ranjan, R., J.K. Biswal, J.K. Mohapatra, M. Rout, S. Subramaniam, L. Rodriguez, J. Arzt, S. Mallick, B. Pattnaik, and R.P. Singh (2025). Understanding foot-and-mouth disease viral ecology by systematic follow-up investigation towards control and elimination of FMD in India. *VirusDisease*, **36**(1): 1.

51. Rasheed, A., I. Altaf, F. Ayub, A. Rasheed, R. Bashir, F. Aslam, I. Waqar, H. Hamid, A. Razak, and K. Saeed (2025). Comparative analysis of VP1 epitopic variation among different isolates of *Foot-and-mouth disease virus* type-O during an outbreak in the Punjab province of Pakistan. *Veterinary Research Forum*, **16**(11): 621-628. DOI: 10.30466/vrf.2025.2041201.4458.

52. Rout, M., L.K. Pandey, B.R. Prusty, J.K. Mohapatra, and R.P. Singh (2025). Optimization and evaluation of 3AB3 indirect ELISA for detection of *Foot-and-mouth disease virus* non-structural protein antibodies in sheep. *VirusDisease*, **36**(1): 1.

53. Rout, M., L.K. Pandey, B.R. Prusty, J.K. Mohapatra, and R.P. Singh (2025). Indirect ELISA diagnostic based on recombinant 3AB3 nonstructural protein of *Foot-and-mouth disease virus* for use in porcine serology. *VirusDisease*, **36**(1): 1.

54. Sahoo, N.R., M. Sahoo, R.K. Mohanty, M.R. Rout, J.K. Mohapatra, S. Saravanan, and R.P. Singh (2025). Developing a medium throughput capillary electrophoresis based method for diagnosis and serotyping of FMD. *VirusDisease*, **36**(1): 1.

55. Sahoo, S., H.K. Lee, and D. Shin (2025). An integrated structural and immunoinformatic approach to design a multi-epitope based vaccine against the *Foot-and-mouth disease virus*. *Scientific Reports*, **15**(1): 13. DOI: 10.1038/s41598-025-19826-6.

56. Salman, A., H. Susetya, S. Indarjulianto, and A. Budiyanto (2025). Spatiotemporal analysis of the re-emerging foot-and-mouth disease outbreak in Central Java, Indonesia. *Open Veterinary Journal*, **15**(6): 2703-2714. DOI: 10.5455/OVJ.2025.v15.i6.39.

57. Sayee, R.H., M. Hosamani, N. Krishnaswamy, S. Shanmuganathan, M.S.S. Charan, D.R. Vignesh, and V. Bhanuprakash (2026). Development of monoclonal antibody based SPCE logistic regression model to predict the protective status of animals vaccinated against FMD virus type A. *Journal of Virological Methods*, **340**: 10. DOI: 10.1016/j.jviromet.2025.115299.

58. Scheffer, D. (2025). Japan lifts import ban after foot-and-mouth disease outbreak. *Fleischwirtschaft*, **105**(12): 1.

59. Semkum, P., N. Mana, V. Lueangaramkul, N. Phetcharat, P. Lekcharoensuk, and S. Theerawatanasirikul (2025). Antiviral efficacy of lignan derivatives (-)-asarinin and sesamin against *Foot-and-mouth disease virus* by targeting RNA-dependent RNA polymerase (3Dpol). *Veterinary Sciences*, **12**(10): 17. DOI: 10.3390/vetsci12100971.

60. Shao, W.H., W. Zhang, Y. Yang, X.Y. Zhao, W.J. Cao, C.W. Chen, W. Wang, M.Y. Huang, T.T. Zhou, Z.X. Zhu, F. Yang, and H.X. Zheng (2025). Ribosomal protein L35 negatively regulates FMDV replication by recruiting AMFR to promote the ubiquitination and degradation of VP2. *Journal of Virology*: 22. DOI: 10.1128/jvi.01453-25.

61. Singh, R.P. (2025). Recent efforts, achievements towards foot-and-mouth disease control in India and way forward for disease elimination. *VirusDisease*, **36**(1): 1.

62. Song, S.K., S.J. Kim, K.S. Shin, S.H. Park, Y.Y. Joo, B.K. Han, C.Y. Lee, G.W. Park, H.O. Ku, W. Jeong, and C.K. Park (2025). Comparative evaluation of modified Vaccinia Ankara as a surrogate virus for disinfectant efficacy testing against AIV, FMDV, and ASFV. *Viruses-Basel*, **17**(9): 14. DOI: 10.3390/v17091156.

63. Sun, M.Y., Y.F. Bao, K. Li, Y.L. Zuo, H.Y. Zhang, Y.F. Fu, P.H. Li, P. Sun, Z.X. Zhao, T. Jiang, X.W. Bai, M. Lin, Z.J. Lu, and Y.M. Cao (2025). A chemiluminescence immunoassay for detecting

neutralizing antibodies of *Foot-and-mouth disease virus* serotype A. *Applied Microbiology and Biotechnology*, **109**(1): 12. DOI: 10.1007/s00253-025-13616-w.

64. Wang, Y., L.H. Zhang, J.R. Deng, L.L. Zheng, Z.H. Chen, Z. Zhang, H. Zhang, J.J. Pei, and H.X. Zheng (2025). Cmss1 limits FMDV infection by enhancing antigen presentation and CD8+ T cell responses. *Journal of Virology*: 22. DOI: 10.1128/jvi.01249-25.

65. Zhang, J., J.L. Wang, Z. Jin, Y.R. Wei, and Z.Z. Zhao (2025). Quantifying aerosol transmission distance for *Foot-and-mouth disease virus*. *Advances in Continuous and Discrete Models*, **2025**(1): 24. DOI: 10.1186/s13662-025-04035-2.

66. Zhang, K.Q., J.J. Zha, P. Sun, Y.F. Ouyang, X.Z. Zhang, X.Q. Ma, F. Liu, D. Li, H.F. Bao, Y.M. Cao, X.W. Bai, Y.F. Fu, K. Li, H. Yuan, J. Zhang, Z.X. Zhao, J. Wang, Q. Zhang, Z.X. Liu, Z.J. Lu, and P.H. Li (2025). Foot-and-mouth disease vaccine with insertion of a 24-amino acid VP1 G-H loop epitope of the Cathay virus provides broad antigenic coverage. *Applied Microbiology and Biotechnology*, **109**(1): 12. DOI: 10.1007/s00253-025-13545-8.

67. Zhang, S., J.N. Lv, Y. Lin, R. Chai, J.X. Liang, Y. Su, Z. Tian, H.Y. Guo, F.Y. Chen, G.Y. Ni, G. Wang, C.M. Song, B.P. Li, Q.Q. Wang, S. Zhao, Q.X. Huang, X.J. Ji, J.J. Duo, F.J. Bai, J. Li, S. Chen, X.Y. Pan, Q. La, Z. Hong, and X.L. Wang (2025). Phylogeographic and host interface analyses reveal the evolutionary dynamics of SAT 3 *Foot-and-mouth disease virus*. *Viruses-Basel*, **17**(12): 16. DOI: 10.3390/v17121641.

68. Zhang, S.L., S.Y. Wu, Y. Liu, X.L. Geng, Y.X. Huang, Y.N. Yue, H. Yan, P. Wu, Y.R. Wang, K.G. Tian, A.H. Wang, and W.Q. Pang (2025). N-terminal truncation of the *Foot-and-mouth disease virus* VP0 protein promotes soluble co-expression and particle assembly stability of viral capsid proteins in *Escherichia coli*. *BMC Biotechnology*, **25**(1): 14. DOI: 10.1186/s12896-025-01049-2.

69. Zhang, Y., T. Wei, M. Ren, S.Y. Mu, M.Y. Bai, S.H. Yin, S.Q. Sun, H.C. Guo, and H. Dong (2025). Virus-like particle-based liquid phase blocking ELISA for evaluating the efficacy of O-type foot-and-mouth disease vaccines. *Applied Microbiology and Biotechnology*, **109**(1): 11. DOI: 10.1007/s00253-025-13638-4.

70. Zhang, Z.H., Z.D. Teng, S. Wang, S.Y. Mu, S.M. Wei, H. Dong, S.H. Yin, Y. Zhang, Y.Z. Ding, Y.J. Li, S.Q. Sun, and H.C. Guo (2025). Distinctive immunological signatures define *Foot-and-mouth disease virus* persistence in vaccinated cattle. *Transboundary and Emerging Diseases*, **2025**(1): 13. DOI: 10.1155/tbed/4010309.

71. Zhong, Z., G.Y. Li, G.L. Liang, T.W. Ren, C.J. Teng, J.P. Xiong, G.Q. Ji, M. Zheng, Y. Pan, Y.F. Qin, K. Ouyang, Y.S. Yin, Y. Chen, W.J. Huang, and Z.Z. Wei (2026). Establishment of a nucleic acid detection method for *Foot-and-mouth disease virus* serotype O utilizing RPA-CRISPR/Cas12a technology. *Journal of Virological Methods*, **340**: 7. DOI: 10.1016/j.jviromet.2025.115304.

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; https://doi.org/10.3389/fvets.2022.1029075). 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 **Error! Reference source not found.** in Section 3.9, **Error! Reference source not found.**), as well as available *in vitro, in vivo* and field data to score the ability of vaccines to protect against these FMDV lineages.

Region	Risk (%)
North Africa	22.64
West and Central Africa	4.9
East Africa	3.95
Southern Africa	3.21
West Eurasia	42.94
India and Southern Asia	8.38
East Asia	11.25
South America	2.73

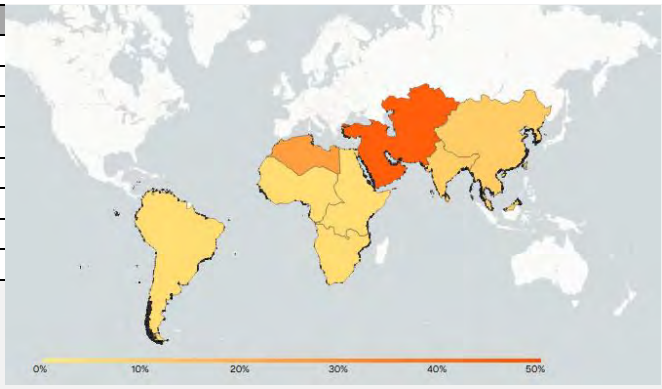


Figure 3: Recommendations from WRLFMD on FMD virus strains to be included in FMDV vaccine antigen bank for Europe (January 2026)

Please contact WRLFMD or EuFMD for assistance to tailor these outputs to other geographical regions. An online version of the tool is available on https://www.openfmd.org/dashboard/pragmatist/.

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:
  - **Ask the Experts webinars**; The EuFMD has held a number of events covering Foot-and-mouth disease and lumpy skin disease as "Ask the Experts" interactive webinar. These one-hour webinars provide an overview about a range a topics that help you enhance your skills in Foot-and-Mouth Disease and lumpy skin disease preparedness, including biosecurity, outbreak investigation, surveillance, vaccination and post-vaccination.
  - **Introduction to Foot-and-Mouth Disease** *(also available in French and German)*; This course introduces foot-and-mouth disease (FMD), its importance, diagnosis, outbreak investigation and the control measures that might apply in a previously free country experiencing an outbreak.
    This course is suitable for all of those with an interest in FMD control. No prior knowledge of FMD is required.
  - **Introduction to the socioeconomics of foot-and-mouth and similar transboundary animal diseases**; This course aims to introduce non-expert learners to the fundamental concepts required to understand the socioeconomic analysis of animal disease. It also forms the basis for further, in-depth training on socioeconomic impact assessment and practical cost-benefit analysis of FMD and similar transboundary animal diseases.
  - **Introduction to sheep pox and goat pox**; This short, open-access and self-directed course aims to provide 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 short module introduces lumpy skin disease, its distribution, impacts, aetiology, diagnosis epidemiology and control options.
    This course is suitable for all of those with an interest in LSD, in affected countries or those at-risk.
  - **Introduction to Rift Valley Fever** *(also available in French)*; This course introduces the diagnosis, prevention and control of RVF, and is suitable for those based in countries that are either endemic or at-risk. The course is designed to be easy to study on a smartphone.

    This course is suitable for anybody who would like to know more about RVF. It will be of particular interest to field veterinarians (public and private) and veterinary paraprofessions who are working in countries that are either endemic or at high risk of RVF. No prior knowledge of RVF is required.
  - **Introduction to Animal Health Surveillance**; This short, open access and self-directed course aims to provide an overview of the importance and key activities of animal health surveillance. It also forms the basis for further, in-depth courses on passive

surveillance.

- **What is the Progressive Control Pathway?** (also available in Arabic); This short e-learning module provides an overview of the Progressive Control Pathway for Foot-and-Mouth Disease (PCP-FMD), the tool used to FMD control under the GF-TADs Global Strategy.

  This course is suitable for all of those with an interest in FMD control in countries which are not free of the disease, and is a good introduction for those new to the PCP-FMD.

- **Introduction to the Risk Assessment Plan** *(also available in French)*; This course is part of a series of self-directed online courses that aim to support progress on the Progressive Control Pathway for Foot-and-Mouth Disease (PCP-FMD).

  The Risk Assessment Plan describes how the country intends to embark on the PCP-FMD and gain an understanding of the epidemiology of FMD in the country. Ultimately, the country will use that knowledge to develop a risk-based plan to reduce the impact of FMD (Risk-Based Strategic Plan).

  This course will be of interest to anyone who is involved in control of FMD in countries which are not currently free of the disease. It is particularly aimed at veterinarians who are working with countries in PCP-FMD Stage Zero and beginning the process of developing a RAP.

- **Introduction to the Risk-Based Strategic Plan**; This course introduces the Risk-Based Strategic Plan (RBSP). The RBSP describes how a country will reduce the impact of FMD in at least one husbandry sector or geographical area. The RBSP applies the outputs and knowledge gained through the implementation of the activities in PCP-FMD Stage One. An accepted RBSP is required for countries to be recognized as in PCP-FMD Stage Two.

  This course will be of interest to anyone who is involved in control of FMD in countries which are not currently free of the disease. It is particularly aimed at veterinarians who are working with countries in PCP-FMD Stage One, and beginning the process of developing an RBSP.

- **Introduction to the Official Control Programme**; This course is part of a series of self-directed online courses that aim to support progress on the Progressive Control Pathway for Foot-and-Mouth Disease (PCP-FMD).

  The OCP describes how the country will eliminate virus circulation of FMD in at least one zone of the country, to mitigate the risks of FMD to the point where an application to WOAH for official recognition of freedom from FMD may be successful and suitable. Completion of the OCP is the indicator outcome for entry into PCP-FMD Stage 3, as defined in the PCP-FMD guidelines.

  This course will be of interest to anyone who is involved in control of FMD in countries which are not currently free of the disease. It is particularly aimed at veterinarians who are working with countries in PCP-FMD Stage Two and beginning the process of developing an OCP.

- **Introduction to the FMD Minimum Biorisk Management Standards**; This course aims to provide 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.

  This course is directed to National Competent Authorities, Institute directors for FMD facilities and biorisk managers in FMD free countries in the European region to ensure

they are aware of the importance and implications of their role in ensuring that laboratories handling infectious FMD virus (Tier D) and performing FMD diagnostic tests without handling infectious FMD virus (Tier C) adhere to the FMD Minimum Biorisk Management Standards.

- **Simulation Exercises for Animal Disease Emergencies**; The Simulation Exercise for Animal Disease Emergencies online training course introduces simulation exercises as part of preparedness for animal disease emergencies and explains the processes involved in planning, conducting and evaluating simulation exercises. It also describes the various tools, approaches and strategies to support decision-making, as well as the different phases of an exercise.
  This course is designed for a range of stakeholders with an interest in learning about animal health emergency preparedness and planning.

- **Diagnosis of foot-and-mouth disease (FMD) : Instructor-led**; WRLFMD, Pirbright, UK – 11-22 May 2026
  This course has been specifically designed for laboratory staff who are responsible for implementing FMDV diagnostic techniques in the laboratory. This course is not suitable for research or group leaders who are not based in the laboratory. The course is designed and taught by subject matter experts within the World Reference Laboratory for FMD. The course will include a combination of hands-on practical sessions, demonstrations, lectures, and eLearning.
- **Workshop on FAST Risk Monitoring and improved control options in North Africa**; Rome, Italy – 2-3 February 2026
  The North African region is constantly threatened by the introduction of new strains of foot-and-mouth disease (FMD), as well as other similar transboundary infectious diseases (such as Lumpy skin disease, Rift valley fever, and Peste des petits ruminants). This situation poses major challenges for prevention and control, requiring continuous risk monitoring, strong capacities to rapidly detect any introduction or circulation of the viruses, and access to reliable vaccines adapted to the epidemiological context.
- **Real time training - NTC38**; Nakuru, Kenya – 23-28 February 2025
  This is a four-day intensive course which allows to see foot-and-mouth in an endemic country, discuss with farmers, peers and expert trainers. The course is preceded by a six-hour virtual Learning induction course. It can give you the unique opportunity to visit farms with suspected FMD cases and carry out clinical and epidemiological investigations in real time.

Meetings

- **107th Session of the Executive Committee (EuFMD)**; FAO HQ, Rome, Italy – 16 April 2026.
- **Open Session of the Standing Technical Committee of the EuFMD - OS26**; Location to be confirmed – 28 October 2026.
- **108th Session of the Executive Committee (EuFMD)**; FAO HQ, Rome, Italy – 28 October 2026.
- **47th General Session of the EuFMD**; FAO HQ, Rome, Italy – 5-6 May 2027.
  The Commission's Member Nations meet in General Session every two years – most of the delegates are the Chief Veterinary Officers of their respective countries. At the General Session, the Member Nations review the activities of the previous biennium,

agree a work plan and budget for the next biennium and elect an Executive Committee and a Standing Technical Committee.

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/).
- EuFMD Emergency Toolbox (https://www.fao.org/eufmd/resources/emergency-toolbox/en/) listing all open-access resources concerning FAST diseases, available in multiple languages.
- Leaflets for the purpose of raising awareness of FMD in the Thrace region. Available in Arabic, Bosnian, Bulgarian, English, Greek and Montenegrin, Portuguese, Serbian and Turkish (https://www.fao.org/publications/card/en/c/CB4903EN).
- Join the EuFMD WhatsApp channel to receive EuFMD updates (https://whatsapp.com/channel/0029VaHkPku2Jl8DJFVFcw3r).

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

SimExOn
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)

eufmd@fao.org

fao.eufmd.org

eufmdlearning.works

eufmd-tom.com

Food and Agriculture Organization
of the United Nations
Rome, Italy

Department for Environment Food & Rural Affairs

THE Pirbright INSTITUTE

UKRI Biotechnology and Biological Sciences Research Council

Thinking of the environmental footprint

Together against wasting resources, think twice before printing

SUSTAINABLE DEVELOPMENT GOALS