WRLFMD

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

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

Foot-and-Mouth Disease

2023

Quarterly report

April–June

This report is version 1

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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 Turkey
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 quarterly report that describes recent data for FMD outbreaks. During this period, the WRLFMD has reported test results for samples received from Bahrain, Ethiopia, Jordan, Nepal and Uganda. There have also been new sequence submissions from Oman (from ANSES on behalf of the Central Laboratory of Animal Health (Oman) and Sultan Qaboos University (Oman)) and the Republic of Korea (APQA). Further information is provided in this report and individual laboratory reports can be retrieved from http://www.wrlfmd.org/.

We have continued to monitor the spread of the SAT2/XIV lineage that has emerged in the past six months to cause FMD outbreaks in countries in the Middle East. This lineage originates in East Africa (Pool 4). Samples tested during this quarter from Bahrain and sequences provided from Oman (via ANSES, France) show that viruses from this lineage have been recently detected in a number of Gulf State countries supporting the idea that trade of live animals into the Persian Gulf from East Africa represents the most likely route by which the SAT2/XIV topotype has been introduced into the region. In Türkiye, SAT2/XIV outbreaks have been reported in Eastern and Central Anatolia, while in the Thrace region SAT2 vaccines (SAT2/Eri-98 from international suppliers and locally produced homologous vaccines from the ŞAP Institute) are being rapidly deployed to try to limit the potential impacts and spread of this lineage. Similarly, prophylactic vaccination using SAT2-specific vaccines is also being used in neighbouring countries (such as Armenia and Georgia).

Elsewhere, new sequence data associated with FMD outbreaks has been received from South Korea, showing that these cases are due to the O/ME-SA/Ind-2001e lineage. This lineage is now widely distributed in Pool 1 (East/Southeast Asia) and has previously spread to cause outbreaks in the Russian Federation (2021), Kazakhstan (2022), Indonesia (2022). There have also been new reports of cases due to serotype O (O/ME-SA/PanAsia-2^{ANT-10}) in Palestine and O-EA-3 in North Africa (Libya).

Don King, Pirbright, July 2023

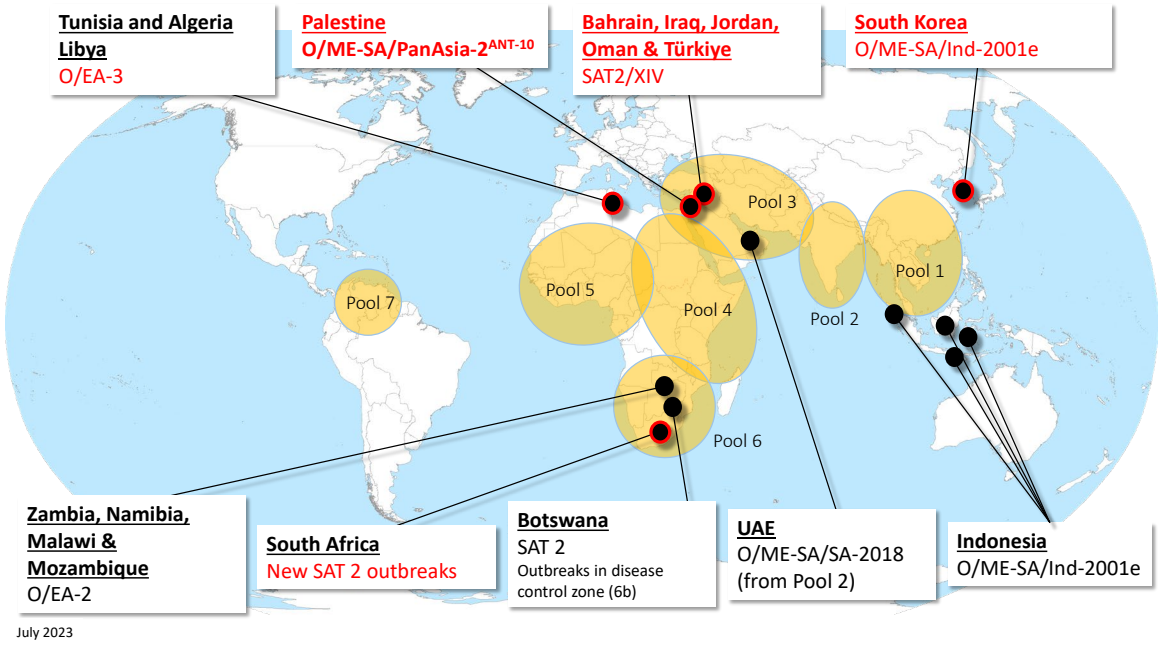


Figure 1: Recent FMD global outbreaks (new headline events reported April to June 2023 are highlighted in red) with endemic pools highlighted in orange. Source: WRLFMD. Map conforms to the United Nations World Map, June 2020.

2. General overview

Endemic Pools represent independently circulating and evolving foot-and-mouth disease virus (FMDV) genotypes; within the pools, cycles of emergence and spread occur that usually affect multiple countries in the region. In the absence of specific reports, it should be assumed that the serotypes indicated below are continuously circulating in parts of the pool area 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, Asia 1 and O
2	**SOUTH ASIA** Bangladesh, Bhutan, India, Mauritius[1], Nepal, Sri Lanka	A, Asia 1 and O
3	**WEST EURASIA & MIDDLE 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, Turkey, Turkmenistan, United Arab Emirates, Uzbekistan	A, Asia 1 and O (SAT 2)
4	**EASTERN AFRICA** Burundi, Comoros, Djibouti, Egypt[3], Eritrea, Ethiopia, Kenya, Rwanda, Somalia, South Sudan, Sudan, Uganda, United Republic of Tanzania, Yemen	O, A, SAT 1, SAT 2 and SAT 3
	NORTH AFRICA[2] Algeria, Libya, Morocco, Tunisia	A, O and SAT 2
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, SAT 1 and SAT 2
6	**SOUTHERN AFRICA** Angola, Botswana, Malawi, Mozambique, Namibia, South Africa, Zambia, Zimbabwe	SAT 1, SAT 2 and SAT 3 (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.

[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 Middle East (Pool 3). NB: Serotypes SAT 1 and SAT 3 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.

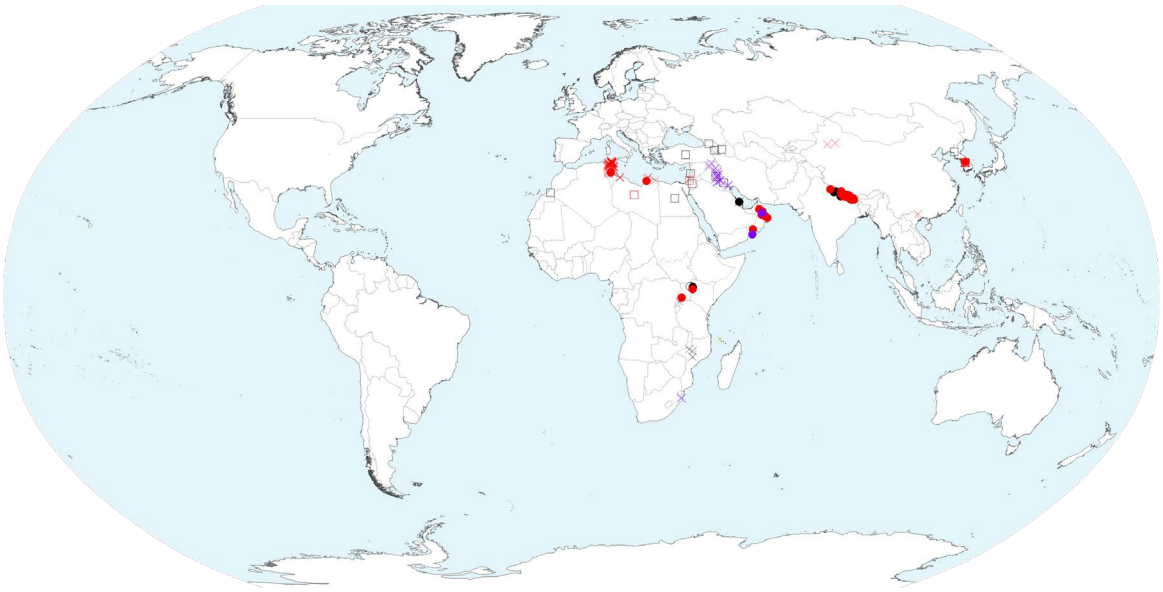


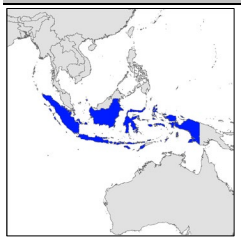
Figure 2: Samples tested by WRLFMD or reported in this quarter. ● indicates samples analysed; × indicates outbreaks reported/updated to the WOAH this quarter; □ indicates reports of FMD from other sources. Shape colours define the serotype detected ●O; ●A; ●C; ●Asia1, ●SAT1, ●SAT2, ●SAT3, ○ FMD not detected,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

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

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

Democratic People's Republic of Korea	
	Local media in late May has reported that FMD has occurred and is spreading in Uiju County in North Pyongan Province and Anju City in South Pyongan Province, North Korea. No official report has been released. ProMED posts: 20230524.8710226

The Republic of Indonesia



The Indonesian government revoked the declared emergency status for FMD at the beginning of April.

ProMED post: 20230404.8709315

The People's Republic of China

Outbreaks of **FMD type O** were reported in cattle on 10 April 2023 at Leiping Animal Health Inspection and disinfection station along Highway S60 (Daxin, Chongzuo, Guangxi), 11 April 2023, at Erbatai Animal Health Inspection and disinfection station along Highway G3012 (Guangxi, Aksu, Xinjiang Uygur) and on 10 May 2023 at Heshuoxian disinfection station along Highway G314 (Hoxud, Bayin'gholin Mongol, Xinjiang Uygur). Genotyping is awaited for each event.

WOAH World Animal Health Information System (event IDs: 5002 , 5047 & 5050)

Republic of Korea

On 26 May 2023, a single **FMD type O** VP1 sequence was received from the APQA. It was derived from a sample collected on 10 May 2023 in Chungju. Genotyping revealed it to belong to the O/ME-SA/Ind-2001e sublineage (see below).

An outbreak of FMD (serotype O) was confirmed on 10th May on 3 Korean beef farms in Cheongju, North Chungcheong Province. FMD was last confirmed in Korea in January 2019. The province immediately initiated emergency quarantine measures and the livestock from the affected farm culled. Surveillance identified 9 other farms in the area with FMD over the next week. The outbreak was declared resolved to WAHIS on 23rd May.

ProMED posts: 20230512.8709997, 20230513.8710030 & 20230518.8710116

3.3. Pool 2 (South Asia)

Nepal

A batch of 80 samples was received on the 28 April 2023. Thirty-six were identified as **FMD type O**, FMDV genome was detected (FMDV-GD) in a further 33 samples and 12 were no virus detected (NVD). Three of the viruses were identified as O/ME-SA/Ind-2001e with one (NEP/59/2021) having two slightly different VP1 sequences. The remaining 33 were genotyped as O/ME-SA/SA-2018. VP1 RT-PCRs were attempted on some of the FMDV-GD samples and five of these were also genotyped as O/ME-SA/SA-2018 (see below)

3.4. Pool 3 (West Eurasia and Middle East)

The Republic of Armenia

Active and passive surveillance is being used. Almost 1 million large and small ruminants were vaccinated against SAT2 in the April-June period.

FAO Eu-FMD FAST report Apr-Jun 2023

The Republic of Azerbaijan

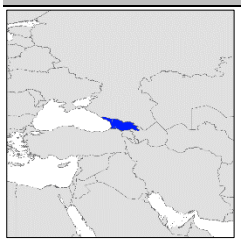
Active and passive surveillance is being used in the country. In the past quarter, 78.3% of large ruminants and 88.0% of small ruminants have been vaccinated.

FAO Eu-FMD FAST report Apr-Jun 2023

The Kingdom of Bahrain

A batch of 10 samples were received on 25 May 2023. Five were identified as **FMD type SAT 2**, three were FMDV-GD and two were NVD. Genotyping showed the SAT 2 viruses to belong to topotype XIV and were closely related to viruses from Ethiopia, Iraq, Jordan, Oman and Türkiye (see below).

Georgia



The spring vaccination campaign has started, where currently almost 400,000 animals (out of a target of more than 900,000) have been vaccinated. Re-vaccination against SAT 2 is also being undertaken with almost 100,000 (from a target of 345,000) animals being re-vaccinated.

FAO Eu-FMD FAST report Apr-Jun 2023

The Islamic Republic of Iran

Russia and Iran signed an agreement in April on mutual scientific and technical cooperation following a visit of Iranian delegates to FGBI "ARRIAH" to negotiate joint cooperation and the supply of veterinary drugs to Iran.

ProMED post: 20230422.8709637

The Republic of Iraq

Two further outbreaks of **FMD type SAT 2** were reported in sheep on 13 June 2023 at tal samer-aljana (Al Ba'aj, Ninawa) and in cattle on 11 June 2023 at Jorf alnadaf (Adhamiya, Baghdad).

WOAH World Animal Health Information System (event IDs: 4856)

510 cases (resulting in 34 deaths) of FMD were reported in Iraq in April and May. Endemic serotypes of O, A and Asia-1 were confirmed, along with SAT2/XIV.

Vaccination in Iraq hasn't occurred since 2021, but there are plans to vaccinate using a quadrivalent [O, A, Asia-1, SAT 2] vaccine.

FAO Eu-FMD FAST report Apr-Jun 2023

The Lebanese Republic

The first phase of a vaccination campaign (vaccinating 85% of target animals) has been completed. Collection of samples for post-vaccination monitoring is currently underway.

FAO Eu-FMD FAST report Apr-Jun 2023

The Sultanate of Oman

Two **FMD type SAT 2** VP1 sequences were received from ANSES on the 28 March 2023 on behalf of the Central Laboratory of Animal Health (Oman) and Sultan Qaboos University (Oman). Genotyping revealed they belonged to topotype XIV and were closely related to viruses from Ethiopia, Bahrain, Iraq, Jordan and Türkiye (see below).

The Hashemite Kingdom of Jordan

Vaccination in areas around recent outbreaks is ongoing. Over 50,000 animals have been vaccinated so far.

FAO Eu-FMD FAST report Apr-Jun 2023

The State of Palestine

A further outbreak of **FMD type O** was reported in cattle on 17 May 2023 at Kafr Dan (Jenin, West Bank).

WOAH World Animal Health Information System (event IDs: 4176)

Four outbreaks of FMD were reported between March and May, caused by the serotype O/ME-SA/PanAsia-2^{ANT-10}. Surveillance (active and passive) and vaccination is on-going. Vaccination of large ruminants with a SAT 2 vaccine is beginning.

FAO Eu-FMD FAST report Apr-Jun 2023

Russian Federation

The Federal Center for Animal Health (FSBI "ARRIAH" of Rosselkhoznadzor) has released 3.5 million doses of vaccine containing a new strain (SAT 2 serotype) of FMD: one million doses of a monovalent SAT 2 vaccine to create a reserve to promptly respond in the event of the exotic serotype being introduced into Russia and 2.5 million doses of a pentavalent anti-FMD vaccine for the countries of the Persian Gulf.

Russia and Iran signed an agreement in April on mutual scientific and technical cooperation following a visit of Iranian delegates to FSBI "ARRIAH" to negotiate joint cooperation and the supply of veterinary drugs to Iran.

ProMED post: 20230422.8709637

The Republic of Türkiye

A total of 139 FMD (49 due to serotype SAT 2 and 59 serotype O) outbreaks were reported this quarter.

Over 25,000 animals were clinically examined for FMD with almost 1200 sera collected for testing by ELISA from the Thrace region this quarter. In the buffer zone area, clinical surveillance was achieved in >95% of the epi-units. While in SE Anatolia clinical surveillance for early detection was implemented.

The Spring vaccination campaign stated in February (using a quadrivalent [O, A, Asia-1] vaccine. But before it was completed SAT 2 was detected. In response a re-vaccination campaign using SAT 2 containing Bi and trivalent vaccines was conducted – achieving 89% coverage.

FAO Eu-FMD FAST report Apr-Jun 2023

3.5. Pool 4 (North and Eastern Africa)

The Arab Republic of Egypt

A vaccination campaign was conducted from March to May, vaccinating more than 500,000 animals. With post-vaccination monitoring conducted on 702 serum samples.

One outbreak of FMD was reported this quarter.

FAO Eu-FMD FAST report Apr-Jun 2023

The State of Libya

A further outbreak due to **FMD type O** was reported on 11 April 2023 in cattle at Sabratha (An Nuqat al Khams). Genotyping is awaited.

WOAH World Animal Health Information System (event IDs: 4990)

Serotype O/EA-3 identified in the current serotype O outbreak in Libya (previously detected in 2019). The cattle the samples were taken from were vaccinated in 2021.

ProMED post: 20230410.8709432

Ten outbreaks of FMD were active this quarter, with O/EA-3 being identified. Passive surveillance is being used, with active surveillance in dairy cattle also being utilized.

FAO Eu-FMD FAST report Apr-Jun 2023

The Kingdom of Morocco

A risk-based serological survey was started in May. The vaccination of cattle was completed in June, while vaccination of sheep and goats is scheduled for September.

FAO Eu-FMD FAST report Apr-Jun 2023

The Republic of Rwanda

An outbreak of **FMD** (serotyping pending) was reported to have occurred in cattle on 18 May 2023 in Rwimiyaga (Nyagatare, Iburasirazuba, Eastern province). Genotyping is awaited.

WOAH World Animal Health Information System (event IDs: 5088)

The Republic of Tunisia

66 cases of FMD serotype O (across 5 outbreaks) have been reported this quarter. Vaccination of cattle and small ruminants is currently underway.

FAO Eu-FMD FAST report Apr-Jun 2023

The Republic of Uganda

On 17 March 2023, a batch of 27 samples were received. **FMD type O** was isolated from four samples, while five were FMDV-GD and 18 were NVD. Genotyping results showed that all four type O viruses belonged to the EA-2 topotype (see below).

WOAH World Animal Health Information System (event IDs: 5088)

3.6. Pool 5 (West/Central Africa)

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

3.7. Pool 6 (Southern Africa)

The Republic of Malawi

Three outbreaks of **FMD** (serotyping pending) were reported to have occurred in cattle on 12 April 2023 at Lombe (Ngabu, Chikawa, Southern region), 9 May 2023 at Lobi (Pomba, Dedza district, Central region) and on 11 May 2023 at Chimkwita (Nsamala, Balaka, Southern region).

WOAH World Animal Health Information System (event IDs: 5099)

The Republic of South Africa

Further detection of **FMD type SAT 2** infection was reported in African buffalo (Syncerus caffer) on 15 May 2023 at Big Five Hlabisa (Umkhanyakude, KwaZulu-Natal). Genotyping is awaited.

WOAH World Animal Health Information System (event IDs: 3738)

3.8. Pool 7 (South America)

Brazil

The Brazilian Agriculture Ministry has banned the storage, sale and use of vaccines against FMD in 7 states (Espirito Santo, Goias, Minas Gerais, Mato Grosso, Mato Grosso do Sul, Tocantins and the federal district) as part of efforts to guarantee Brazil's status as free of FMD and expand zones free of the disease without vaccination by 2026.

ProMED posts: 20230407.8709371

3.9. Extent of global surveillance

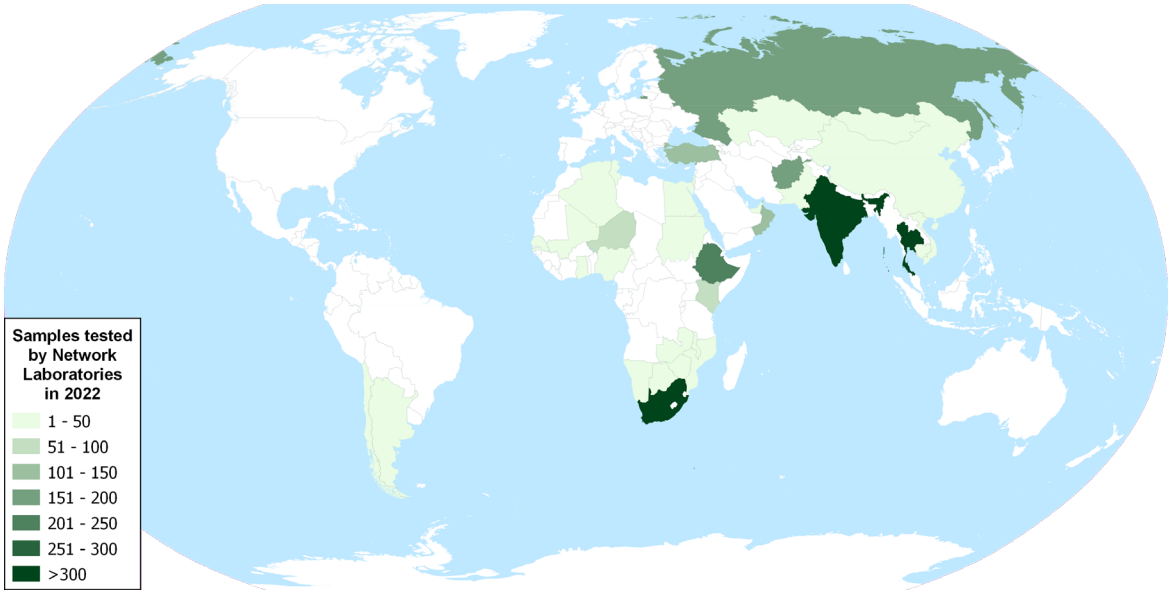


Figure 3: Samples received during 2022 from FMD outbreaks (routine surveillance that is undertaken in countries that are FMD-free without vaccination is not shown). Data from presentations given at the WOAH/FAO FMD reference laboratory network annual meeting (https://www.foot-and-mouth.org/Ref-Lab-Network/Network-Annual-Meeting). 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).

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-2023.

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 April to June 2023 is shown in Annex 1: (Summary of submissions). A record of all samples received by WRLFMD is shown in Annex 1: (Clinical samples).

Table 1: Conjectured relative prevalence of circulating FMD viral lineages in each Pool. 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 (reviewed at the WOAH/FAO FMD reference laboratory network meeting in December 2021) can be used to inform the PRAGMATIST tool (see Annex 3). Recent changes to increase risks are shown in **red**, while a reduction in risk is shown in **green**. NB: In response to the FMD cases due to SAT2/XIV, risks in Pool 3 were reviewed and revised in April 2023

Lineage	Southeast / Central / East Asia [Pool 1]	South Asia [Pool 2]	West Eurasia & Middle 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			28					
O ME-SA PanAsia	10							
O SEA Mya-98	21.5							
O ME-SA Ind2001	40	86[1]	5.5	2				
O EA or O WA			2.5	55	55.5	65	16	
O EURO-SA								90
O CATHAY	10.5							
A ASIA Sea-97	18							
A ASIA Iran-05	0		25					
A ASIA G-VII		10	8					
A AFRICA				33	22	17		
A EURO-SA								10
Asia-1	0	4	11					
SAT 1				0	8	3	16	
SAT 2			20	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 Pool 2.

Table 2: Status of sequencing of samples or sequences received by the WRLFMD from April to June 2023.

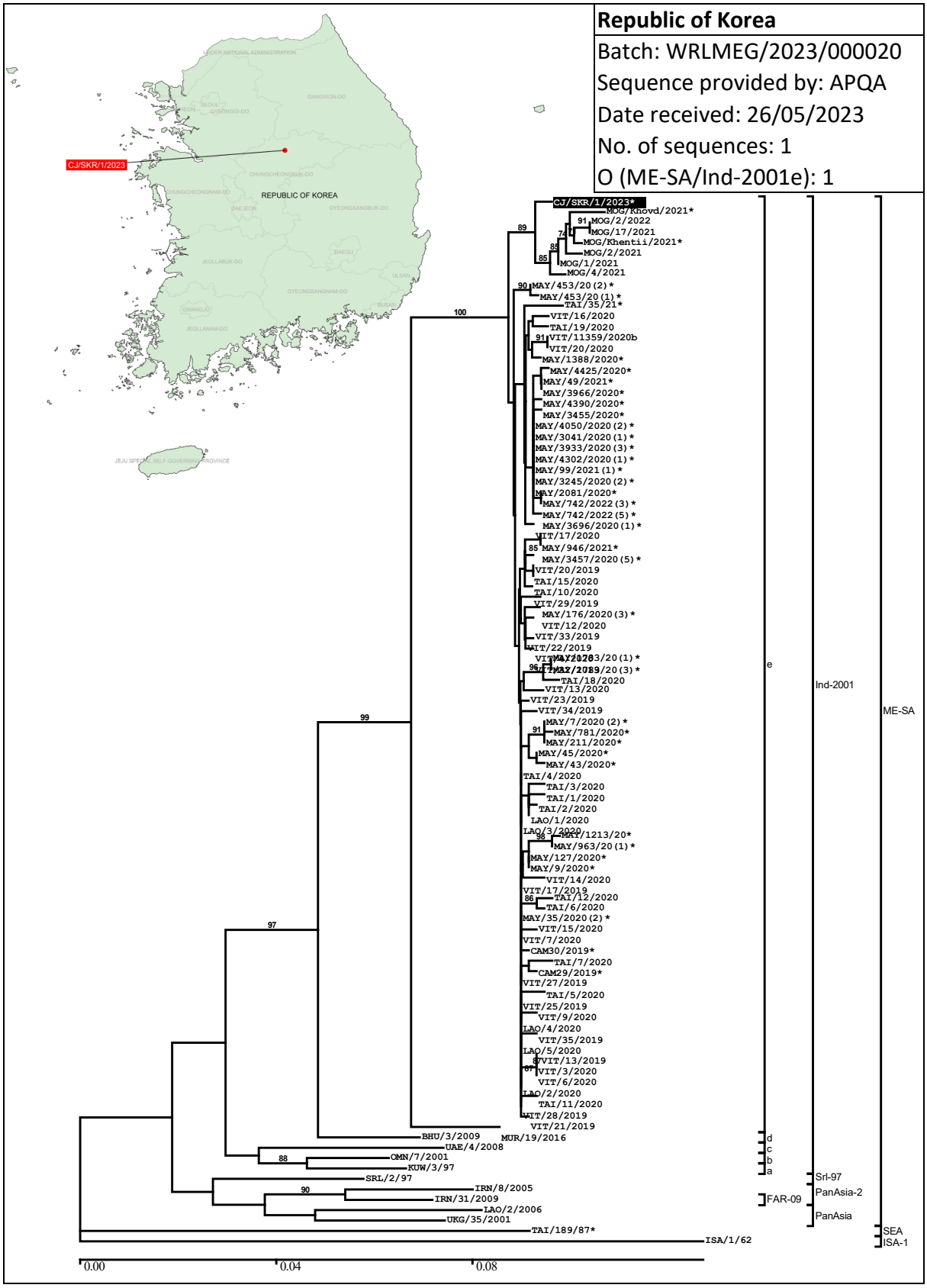
WRLFMD Batch No.	Date received	Country	Total No. samples	Serotype	No. of samples	No. of sequences	Sequencing status
WRLFMD/2023/000016	17/03/2023	Uganda	27	O	4	4	Finished
				FMDV-GD	5		
				NVD	18		
WRLFMD/2023/000039	28/04/2023	Nepal	80	O	38	38	Finished
				O	3	4	Finished
				FMDV-GD	27		
				NVD	12		
WRLFMD/2023/000040	25/05/2023	Bahrain	10	SAT 2	5	5	Finished
				FMDV-GD	3		
				NVD	2		
Totals			**117**		**117**	**51**	

Table 3: VP1 sequences submitted by other FMD laboratories to the WRLFMD from April to June 2023.

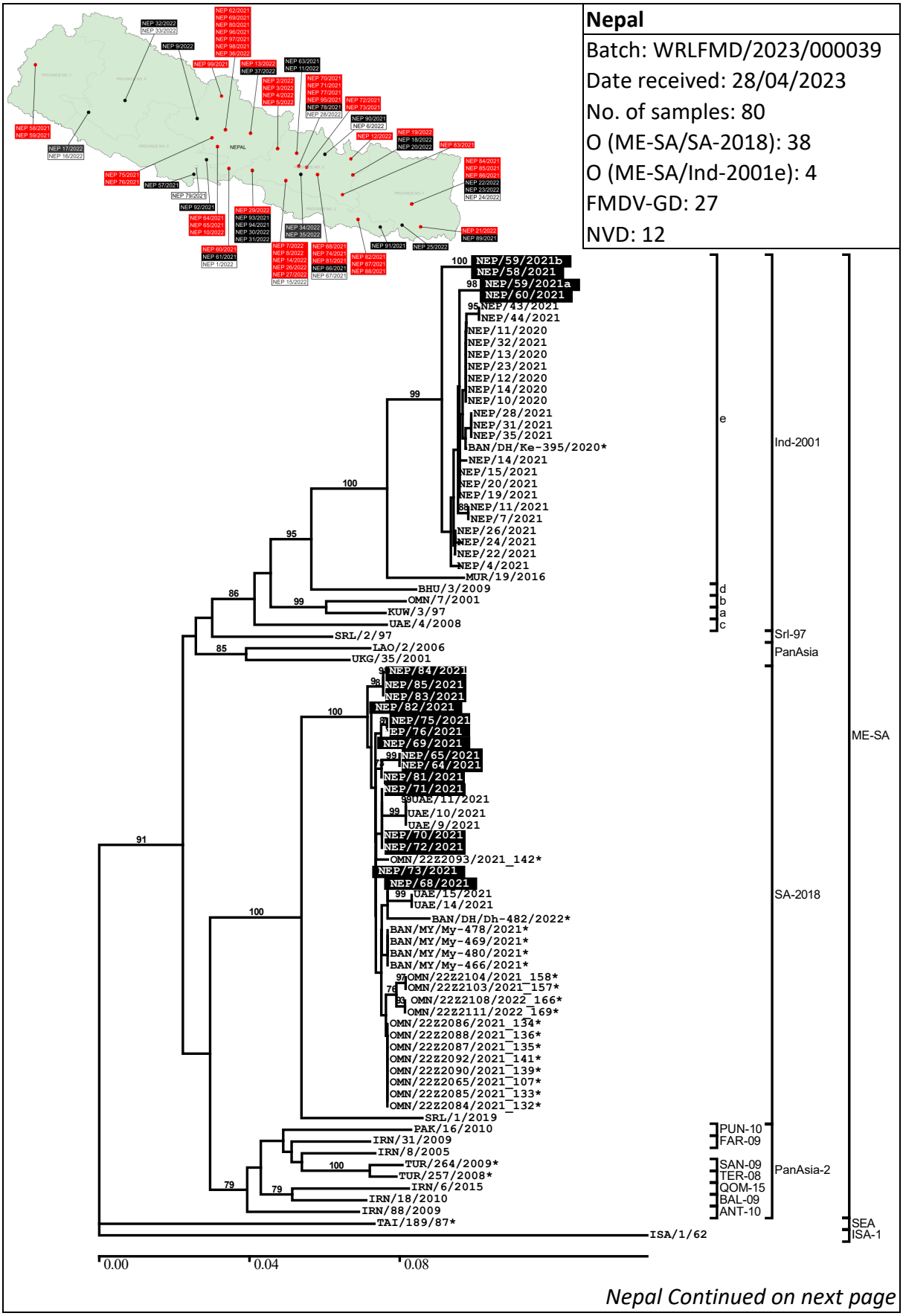
WRLFMD Batch No.	Date received	Country	Serotype	Date Collected	No. of sequences	Submitting laboratory
WRLMEG/2023/000018	28/04/2023	Oman	SAT 2	2023	2	ANSES
WRLMEG/2023/000020	26/05/2023	South Korea	O	10/05/2023	1	APQA
				Total	**3**	

4. Detailed analysis

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



4.2. Pool 2 (South Asia)



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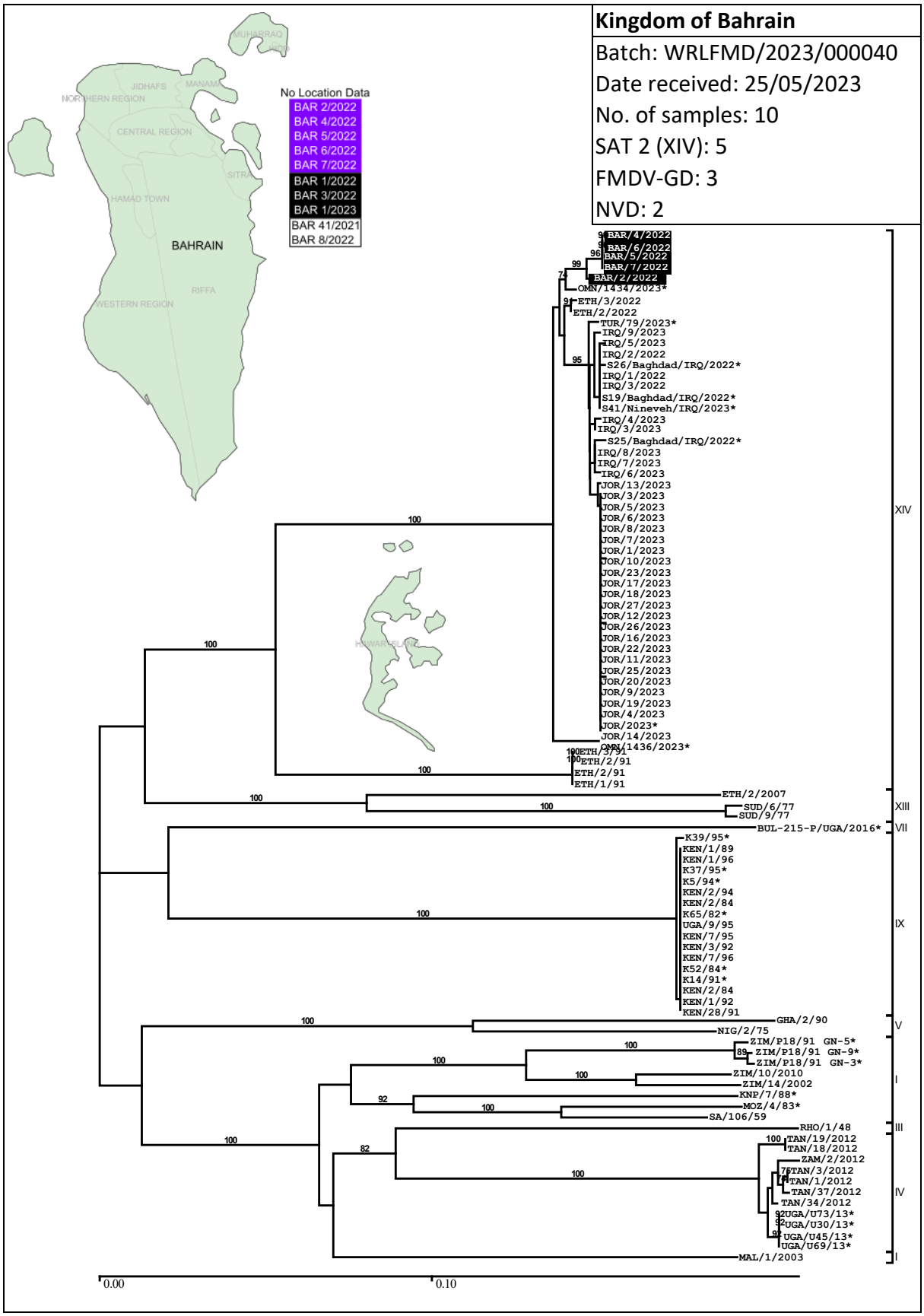
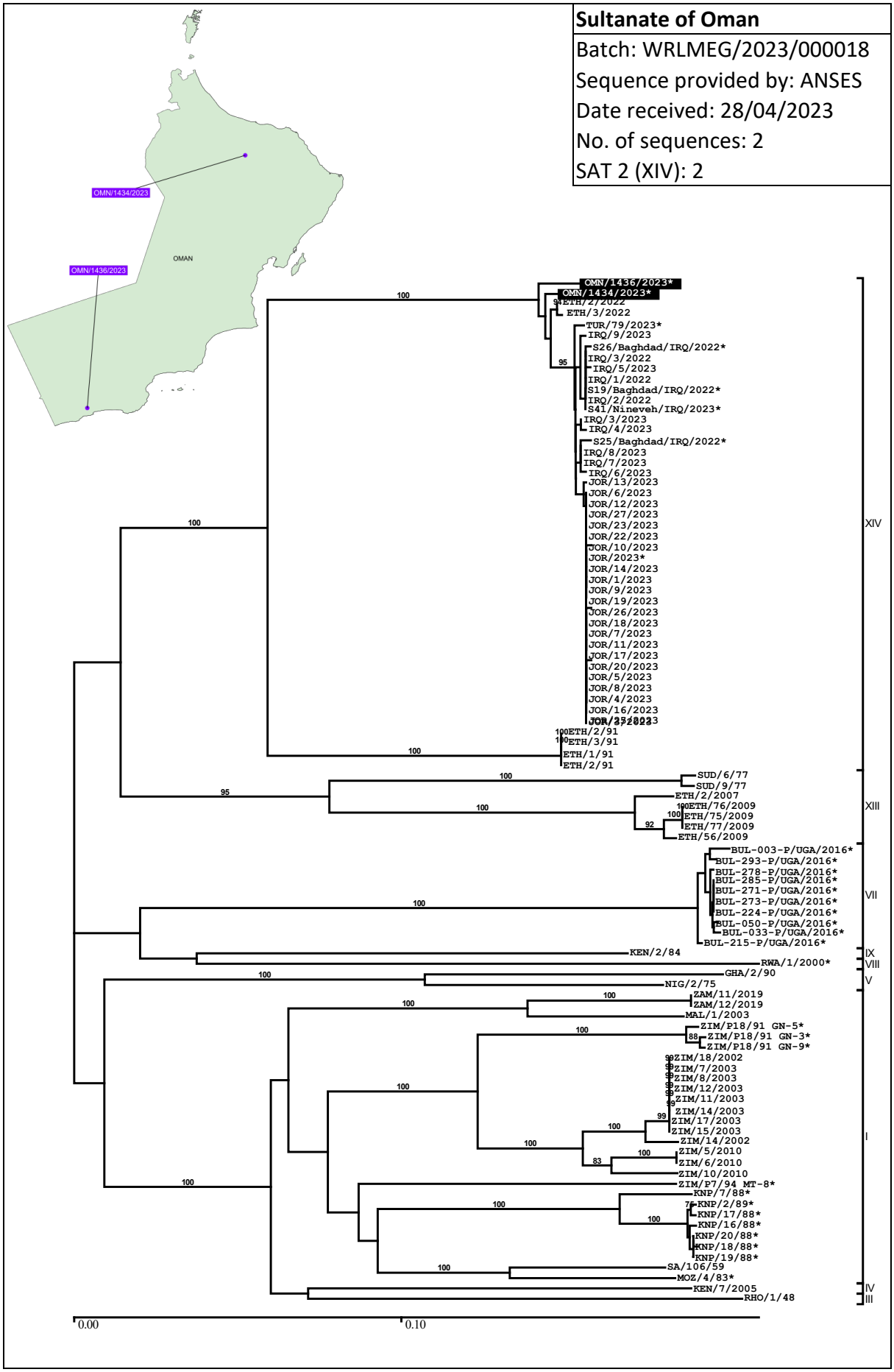
4.3. Pool 3 (West Eurasia and Middle East)




Sultanate of Oman
Batch: WRLMEG/2023/000018
Sequence provided by: ANSES
Date received: 28/04/2023
No. of sequences: 2
SAT 2 (XIV): 2
OMN/1434/2023
OMN/1436/2023
OMAN
OMN/1436/2023*
OMN/1434/2023*
ETH/2/2022
ETH/3/2022
TUR/79/2023*
IRQ/9/2023
S26/Baghdad/IRQ/2022*
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BUL-278-P/UGA/2016*
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BUL-271-P/UGA/2016*
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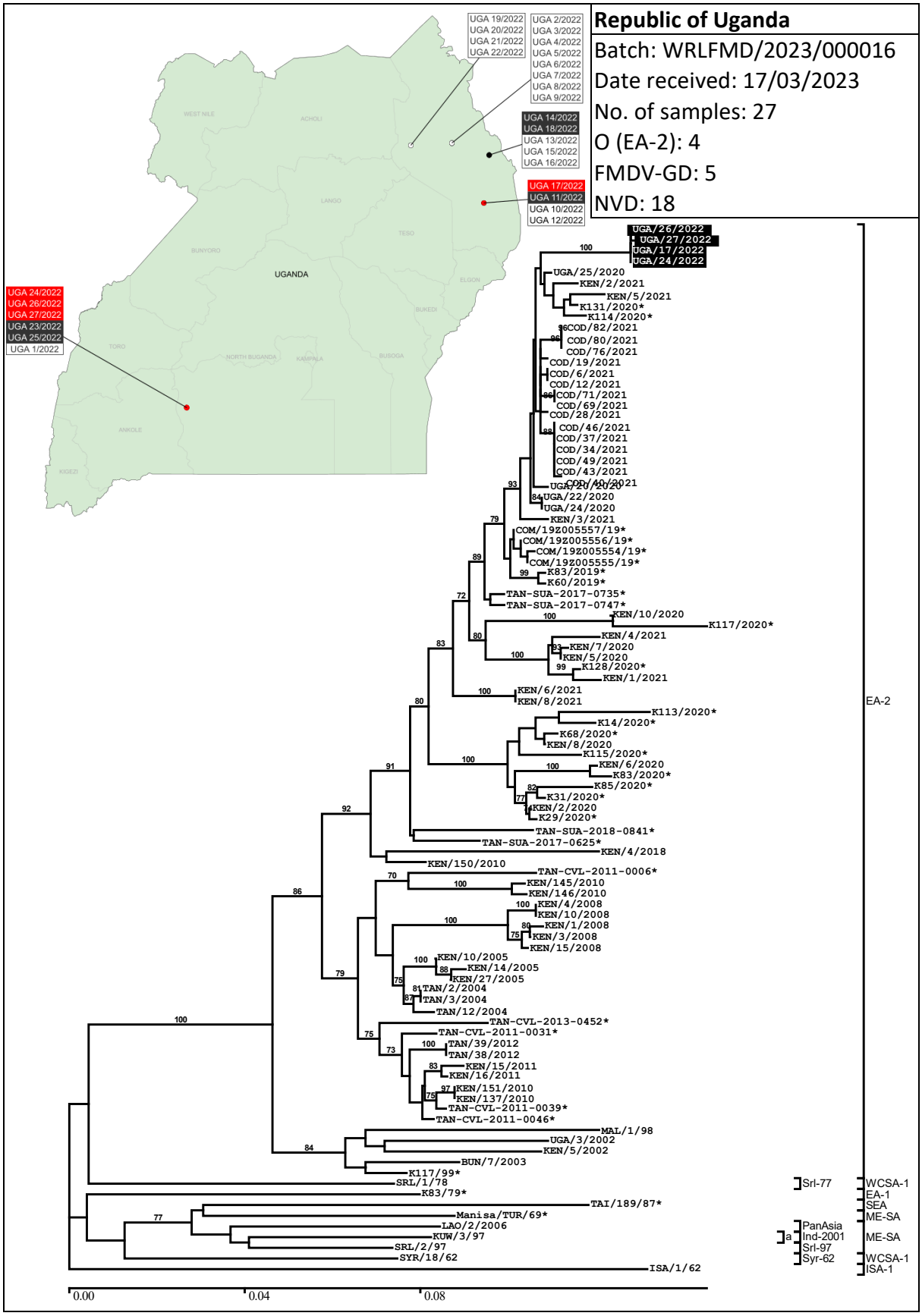
BUL-224-P/UGA/2016*
BUL-050-P/UGA/2016*
BUL-033-P/UGA/2016*
BUL-215-P/UGA/2016*
KEN/2/84
RWA/1/2000*
GHA/2/90
NIG/2/75
ZAM/11/2019
ZAM/12/2019
MAL/1/2003
ZIM/P18/91 GN-5*
ZIM/P18/91 GN-3*
ZIM/P18/91 GN-9*
ZIM/18/2002
ZIM/7/2003
ZIM/8/2003
ZIM/12/2003
ZIM/11/2003
ZIM/14/2003
ZIM/17/2003
ZIM/15/2003
ZIM/14/2002
ZIM/5/2010
ZIM/6/2010
ZIM/10/2010
ZIM/P7/94 MT-8*
KNP/7/88*
KNP/2/89*
KNP/17/88*
KNP/16/88*
KNP/20/88*
KNP/18/88*
KNP/19/88*
SA/106/59
MOZ/4/83*
KEN/7/2005
RHO/1/48
XIV
XIII
VII
IX
VIII
V
I
IV
III
0.00
0.10

4.4. Pool 4 (North and East Africa)



4.5. Pool 6 (Southern Africa)

No samples/sequences received.

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 April to June 2023.

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	-	-	-	-	-	2	-
Jordan	-	-	-	-	-	3	-
Uganda	2	-	-	-	-	-	-
Total	**2**	**0**	**0**	**0**	**0**	**5**	**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 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

Isolate	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*	
	Topotype	Lineage	r_1	*titre*	r_1	*titre*	r_1	*titre*	r_1	*titre*	r_1	*titre*	r_1	*titre*
UGA 17/2022	EA-2	-	0.75	*1.88*	0.40	*1.98*	0.35	*2.43*	0.57	*2.15*	0.49	*2.03*	0.49	*2.03*
UGA 27/2022	EA-2	-	0.95	*1.97*	0.32	*1.89*	0.44	*2.53*	0.52	*2.11*	0.43	*1.97*	0.53	*2.06*

Table 6: Vaccine matching studies for SAT 2 FMDV

Isolate	Serotype SAT 2		Eritrea 98 *Boehringer Ingelheim*		SAT2 Zim 83 *Boehringer Ingelheim*	
	Topotype	Lineage	r_1	*titre*	r_1	*titre*
JOR 11/2023	XIV	-	0.58	*1.69*	0.20	*1.74*
JOR 20/2023	XIV	-	0.83	*1.85*	0.24	*1.81*
JOR 26/2023	XIV	-	0.86	*1.86*	0.32	*1.94*
ETH/2/2022	XIV	-	0.81	*1.62*	0.54	*2.17*
ETH/3/2022	XIV	-	0.49	*1.66*	0.15	*1.70*

Annex 1: Sample data

Summary of submissions

Table 7: Summary of samples collected and received to WRLFMD April to June 2023

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*	*ASIA-1*		*Positive*	*Negative*
Bahrain	10	-	-	-	-	5	-	-	5	8	2
Nepal	80	35	-	-	-	-	-	-	45	67	13
Uganda	27	4	-	-	-	-	-	-	23	9	18
TOTAL	**117**	**39**	**0**	**0**	**0**	**5**	**0**	**0**	**73**	**84**	**33**

Clinical samples

Table 8: Clinical sample diagnostics made by the WRLFMD April to June 2023

Country	Date		WRL for FMD Sample Identification	Animal	Date of Collection	Results		
	Received	Reported				VI/ELISA	RT-PCR	Final report
Uganda	17-Mar-23	05-Apr-23	UGA 8/2022	CATTLE	20-Nov-22	NVD	NGD	NVD
			UGA 9/2022	CATTLE	20-Nov-22	NVD	NGD	NVD
			UGA 10/2022	CATTLE	20-Nov-22	NVD	NGD	NVD
			UGA 11/2022	CATTLE	20-Nov-22	NVD	FMDV GD	FMDV GD
			UGA 12/2022	CATTLE	20-Nov-22	NVD	NGD	NVD
			UGA 13/2022	CATTLE	20-Nov-22	NVD	NGD	NVD
			UGA 1/2022	CATTLE	20-Nov-22	NVD	NGD	NVD
			UGA 2/2022	CATTLE	20-Nov-22	NVD	NGD	NVD
			UGA 3/2022	CATTLE	20-Nov-22	NVD	NGD	NVD
			UGA 4/2022	CATTLE	20-Nov-22	NVD	NGD	NVD
			UGA 5/2022	CATTLE	20-Nov-22	NVD	NGD	NVD
			UGA 6/2022	CATTLE	20-Nov-22	NVD	NGD	NVD
			UGA 7/2022	CATTLE	20-Nov-22	NVD	NGD	NVD
			UGA 14/2022	CATTLE	20-Nov-22	NVD	FMDV GD	FMDV GD
			UGA 15/2022	CATTLE	20-Nov-22	NVD	NGD	NVD
			UGA 16/2022	CATTLE	20-Nov-22	NVD	NGD	NVD
			UGA 17/2022	CATTLE	20-Nov-22	O	FMDV GD	O
			UGA 18/2022	CATTLE	20-Nov-22	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
			UGA 19/2022	CATTLE	21-Nov-22	NVD	NGD	NVD
			UGA 20/2022	CATTLE	21-Nov-22	NVD	NGD	NVD
			UGA 21/2022	CATTLE	21-Nov-22	NVD	NGD	NVD
			UGA 22/2022	CATTLE	21-Nov-22	NVD	NGD	NVD
			UGA 23/2022	CATTLE	29-Nov-22	NVD	FMDV GD	FMDV GD
			UGA 24/2022	CATTLE	29-Nov-22	O	FMDV GD	O
			UGA 25/2022	CATTLE	29-Nov-22	NVD	FMDV GD	FMDV GD
			UGA 26/2022	CATTLE	29-Nov-22	O	FMDV GD	O
			UGA 27/2022	CATTLE	29-Nov-22	O	FMDV GD	O
Nepal	28-Apr-23	26-May-23	NEP 57/2021	COW	10-Aug-21	NVD	FMDV GD	FMDV GD
			NEP 58/2021	COW	19-Aug-21	O	FMDV GD	O
			NEP 59/2021	OX	19-Aug-21	O	FMDV GD	O
			NEP 60/2021	COW	06-Sep-21	O	FMDV GD	O
			NEP 61/2021	COW	06-Sep-21	NVD	FMDV GD	FMDV GD
			NEP 62/2021	BUFFALO	06-Sep-21	NVD	FMDV GD	FMDV GD
			NEP 63/2021	COW	06-Sep-21	NVD	FMDV GD	FMDV GD
			NEP 64/2021	COW	13-Sep-21	O	FMDV GD	O
			NEP 65/2021	COW	13-Sep-21	O	FMDV GD	O
			NEP 66/2021	COW	05-Oct-21	NVD	FMDV GD	FMDV GD
			NEP 67/2021	GOAT	05-Oct-21	NVD	NGD	NVD
			NEP 68/2021	COW	05-Oct-21	O	FMDV GD	O
			NEP 69/2021	SWINE	28-Oct-21	O	FMDV GD	O
			NEP 70/2021	COW	29-Oct-21	O	FMDV GD	O
			NEP 71/2021	COW	29-Oct-21	O	FMDV GD	O
			NEP 72/2021	COW	01-Nov-21	O	FMDV GD	O
			NEP 73/2021	COW	01-Nov-21	O	FMDV GD	O
			NEP 74/2021	COW	14-Nov-21	NVD	FMDV GD	FMDV GD
			NEP 75/2021	BUFFALO	16-Nov-21	O	FMDV GD	O
			NEP 76/2021	COW	16-Nov-21	O	FMDV GD	O
			NEP 77/2021	COW	17-Nov-21	NVD	FMDV GD	FMDV GD
			NEP 78/2021	COW	17-Nov-21	NVD	FMDV GD	FMDV GD
			NEP 79/2021	SWINE	24-Nov-21	NVD	NGD	NVD
			NEP 80/2021	SWINE	27-Nov-21	NVD	NGD	NVD
			NEP 81/2021	COW	03-Dec-21	O	FMDV GD	O
			NEP 82/2021	BUFFALO	03-Dec-21	O	FMDV GD	O
			NEP 83/2021	BUFFALO	04-Dec-21	O	FMDV GD	O
			NEP 84/2021	SWINE	05-Dec-21	O	FMDV GD	O
			NEP 85/2021	SWINE	05-Dec-21	O	FMDV GD	O
			NEP 86/2021	SWINE	05-Dec-21	O	FMDV GD	O
			NEP 87/2021	BUFFALO	05-Dec-21	O	FMDV GD	O
			NEP 88/2021	COW	05-Dec-21	O	FMDV GD	O

Country	Date		WRL for FMD Sample Identification	Animal	Date of Collection	Results		
	Received	Reported				VI/ELISA	RT-PCR	Final report
			NEP 89/2021	COW	07-Dec-21	NVD	FMDV GD	FMDV GD
			NEP 90/2021	OX	15-Dec-21	NVD	FMDV GD	FMDV GD
			NEP 91/2021	COW	15-Dec-21	NVD	FMDV GD	FMDV GD
			NEP 92/2021	OX	17-Dec-21	NVD	FMDV GD	FMDV GD
			NEP 93/2021	BUFFALO	20-Dec-21	NVD	FMDV GD	FMDV GD
			NEP 94/2021	COW	20-Dec-21	NVD	FMDV GD	FMDV GD
			NEP 95/2021	COW	21-Dec-21	O	FMDV GD	O
			NEP 96/2021	SWINE	21-Dec-21	NVD	NGD	NVD
			NEP 97/2021	SWINE	21-Dec-21	NVD	NGD	NVD
			NEP 98/2021	SWINE	21-Dec-21	NVD	NGD	NVD
			NEP 99/2021	COW	24-Dec-21	O	FMDV GD	O
			NEP 1/2022	COW	02-Jan-22	NVD	NGD	NVD
			NEP 2/2022	COW	03-Jan-22	O	FMDV GD	O
			NEP 3/2022	GOAT	03-Jan-22	O	FMDV GD	O
			NEP 4/2022	COW	03-Jan-22	O	FMDV GD	O
			NEP 5/2022	COW	03-Jan-22	O	FMDV GD	O
			NEP 6/2022	GOAT	06-Jan-22	NVD	NGD	NVD
			NEP 7/2022	COW	06-Jan-22	O	FMDV GD	O
			NEP 8/2022	COW	06-Jan-22	O	FMDV GD	O
			NEP 9/2022	GOAT	10-Jan-22	NVD	FMDV GD	FMDV GD
			NEP 10/2022	OX	19-Jan-22	NVD	FMDV GD	FMDV GD
			NEP 11/2022	OX	20-Jan-22	NVD	FMDV GD	FMDV GD
			NEP 12/2022	COW	23-Jan-22	NVD	FMDV GD	FMDV GD
			NEP 13/2022	COW	23-Jan-22	O	FMDV GD	O
			NEP 14/2022	GOAT	04-Feb-22	O	FMDV GD	O
			NEP 15/2022	GOAT	07-Feb-22	NVD	NGD	NVD
			NEP 16/2022	COW	08-Feb-22	NVD	NGD	NVD
			NEP 17/2022	BUFFALO	08-Feb-22	NVD	FMDV GD	FMDV GD
			NEP 18/2022	SWINE	11-Feb-22	NVD	FMDV GD	FMDV GD
			NEP 19/2022	OX	11-Feb-22	O	FMDV GD	O
			NEP 20/2022	GOAT	11-Feb-22	NVD	FMDV GD	FMDV GD
			NEP 21/2022	COW	13-Feb-22	O	FMDV GD	O
			NEP 22/2022	BUFFALO	21-Feb-22	NVD	FMDV GD	FMDV GD
			NEP 23/2022	BUFFALO	21-Feb-22	NVD	FMDV GD	FMDV GD
			NEP 24/2022	BUFFALO	21-Feb-22	NVD	NGD	NVD
			NEP 25/2022	SWINE	10-Mar-22	NVD	FMDV GD	FMDV GD
			NEP 26/2022	COW	11-Mar-22	O	FMDV GD	O
			NEP 27/2022	COW	13-Mar-22	O	FMDV GD	O
			NEP 28/2022	SWINE	16-Mar-22	NVD	NGD	NVD
			NEP 29/2022	SWINE	20-Mar-22	NVD	FMDV GD	FMDV GD
			NEP 30/2022	SWINE	20-Mar-22	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 31/2022	COW	24-Apr-22	NVD	FMDV GD	FMDV GD
			NEP 32/2022	COW	26-Apr-22	NVD	FMDV GD	FMDV GD
			NEP 33/2022	COW	26-Apr-22	NVD	NGD	NVD
			NEP 34/2022	COW	19-May-22	NVD	FMDV GD	FMDV GD
			NEP 35/2022	COW	19-May-22	NVD	FMDV GD	FMDV GD
			NEP 36/2022	SWINE	09-Jun-22	O	FMDV GD	O
			NEP 37/2022	BUFFALO	27-Jun-22	NVD	FMDV GD	FMDV GD
Bahrain	25-May-23	26-Jun-23	BAR 41/2021	CATTLE	29-Dec-21	NVD	NGD	NVD
			BAR 1/2022	CATTLE	23-Nov-22	NVD	FMDV GD	FMDV GD
			BAR 2/2022	CATTLE	23-Nov-22	SAT2	FMDV GD	SAT2
			BAR 3/2022	CATTLE	23-Nov-22	NVD	FMDV GD	FMDV GD
			BAR 4/2022	CATTLE	24-Nov-22	SAT2	FMDV GD	SAT2
			BAR 5/2022	CATTLE	24-Nov-22	SAT2	FMDV GD	SAT2
			BAR 6/2022	CATTLE	24-Nov-22	SAT2	FMDV GD	SAT2
			BAR 7/2022	CATTLE	24-Nov-22	SAT2	FMDV GD	SAT2
			BAR 8/2022	CATTLE	24-Nov-22	NVD	NGD	NVD
			BAR 1/2023	CATTLE	09-Feb-23	NVD	FMDV GD	FMDV GD
TOTAL					**117**			

Annex 2: FMD publications

Recent FMD Publications April to June 2023 cited by Web of Science.

1. Avalos, A., B. Durand, J. Naranjo, V. Maldonado, L. Canini, and G. Zanella (2022). Analysis of cattle movement networks in Paraguay: Implications for the spread and control of infectious diseases. *PLoS One*, **17**(12): 22. DOI: 10.1371/journal.pone.0278999.
2. Bayantassova, S., K. Kushaliyev, I. Zhubantayev, A. Zhanabayev, Z. Kenzhegaliyev, A. Ussenbayev, A. Paritova, G. Baikadamova, T. Bakishev, A. Zukhra, A. Terlikbayev, N. Akhmetbekov, M. Tokayeva, N. Burambayeva, L. Bauzhanova, A. Temirzhanova, A. Rustem, M. Aisin, S. Tursunkulov, N. Rametov, and A. Issimov. Knowledge, attitude and practice (KAP) of smallholder farmers on foot-and-mouth disease in Cattle in West Kazakhstan. *Veterinary Medicine and Science*: 9. DOI: 10.1002/vms3.1097.
3. Begovoeva, M., D.O. Ehizibolo, A.J. Adedeji, M.O. Oguche, O. Oyekan, S.I. Ijoma, R.B. Atai, Y. Wungak, B.B. Dogonyaro, D.D. Lazarus, M. Samson, H. Ularamu, M. Muhammad, F. Rosso, K.J. Sumption, P.M. Beard, A.B. Ludi, K.B. Stevens, and G. Limon (2023). Factors associated with foot-and-mouth disease seroprevalence in small ruminants and identification of hot-spot areas in northern Nigeria. *Preventive Veterinary Medicine*, **212**: 11. DOI: 10.1016/j.prevetmed.2023.105842.
4. Conrady, B., S. Mortensen, S.S. Nielsen, H. Houe, F.F. Calvo-Artavia, J. Ellis-Iversen, and A. Boklund (2023). Simulation of foot-and-mouth disease spread and effects of mitigation strategies to support veterinary contingency planning in Denmark. *Pathogens*, **12**(3): 23. DOI: 10.3390/pathogens12030435.
5. Fu, Y.F., D. Li, Y.M. Cao, P. Zhou, K. Li, Z.X. Zhao, P.H. Li, X.W. Bai, H.F. Bao, S.T. Wang, L.X. Zhao, X.X. Wang, Z.X. Liu, P. Sun, and Z.J. Lu (2023). Development of a double-antibody sandwich ELISA for rapidly quantitative detection of residual non-structural proteins in inactivated *Foot-and-mouth disease virus* vaccines. *Journal of Virological Methods*, **314**: 7. DOI: 10.1016/j.jviromet.2023.114676.
6. Gobiye, M., G.T. Fosgate, L. Heath, D.D. Lazarus, L. Seoke, and P.A. Opperman (2023). Preliminary validation of a single-spot version of a solid-phase competition ELISA for the detection of southern African territories foot-and-mouth disease serotype exposure in goats. *Small Ruminant Research*, **224**: 9. DOI: 10.1016/j.smallrumres.2023.106982.
7. Hofstra, G., H. van Abeelen, M. Duindam, B. Houben, J. Kuijpers, T. Arendsen, M. van der Kolk, F. Rapp, J. van Spaendonk, J.L. Gonzales, and R. Petie (2023). Automated monitoring and detection of disease using a generic facial feature scoring system-A case study on FMD infected cows. *Preventive Veterinary Medicine*, **213**: 8. DOI: 10.1016/j.prevetmed.2023.105880.
8. Hoogesteyn, A.L., A.L. Rivas, S.D. Smith, F.O. Fasina, J.M. Fair, and M. Kosoy (2023). Assessing complexity and dynamics in epidemics: geographical barriers and facilitators of foot-and-mouth disease dissemination. *Frontiers in Veterinary Science*, **10**: 10. DOI: 10.3389/fvets.2023.1149460.
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10. Kerfua, S.D., A.F. Railey, and T.L. Marsh (2023). Household production and consumption

impacts of foot-and-mouth disease at the Uganda-Tanzania border. *Frontiers in Veterinary Science*, **10**: 9. DOI: 10.3389/fvets.2023.1156458.

11. Kim, J.Y., S.Y. Park, J.S. Jin, D. Kim, J.H. Park, S.H. Park, and Y.J. Ko (2023). Efficacy of binary ethylenimine in the inactivation of *Foot-and-mouth disease virus* for vaccine production in South Korea. *Pathogens*, **12**(6): 8. DOI: 10.3390/pathogens12060760.
12. Lee, B.R., H.J. Lee, N.H. Kim, Y.S. Kim, and K.I. Park (2023). Increased effect of *Foot-and-mouth disease virus* vaccine structural protein antibody positivity rates in piglets orally treated with amino-zinc complex. *Animals*, **13**(12): 12. DOI: 10.3390/ani13122027.
13. Lee, G., H.R. Kang, A. Kim, J.H. Park, M.J. Lee, and S.M. Kim (2023). Preventive effects of quercetin against *Foot-and-mouth disease virus in vitro* and *in vivo* by inducing type I interferon. *Frontiers in Microbiology*, **14**: 11. DOI: 10.3389/fmicb.2023.1121830.
14. McKee, S.C., V.R. Brown, S.A. Shwiff, G.M. Giallombardo, and R.S. Miller (2023). Areas within the United States at the highest risk for African swine fever, classical swine fever, and foot-and-mouth disease introduction. *Transboundary and Emerging Diseases*, **2023**: 10. DOI: 10.1155/2023/8892037.
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16. Metwally, S., B. Wagner, M. Salman, J.A. Drewe, G. Ferrari, M. McLaws, and J.L. Gonzales (2023). Application of surveillance principles in the progressive control pathway for global control of foot-and-mouth disease. *Agriculture-Basel*, **13**(5): 6. DOI: 10.3390/agriculture13050994.
17. Mielke, S.R., S. Lendzele, A.H. Delgado, M. Abdoulmoumini, S. Dickmu, and R. Garabed (2023). Patterns of *Foot-and-mouth disease virus* detection in environmental samples in an endemic setting. *Frontiers in Veterinary Science*, **10**: 12. DOI: 10.3389/fvets.2023.1157538.
18. Nguyen, N.H., T.Q. Nguyen, D.C. Lai, M.D.N. Thi, and M.N. Nguyen (2023). Phylogenetic and genotypic characteristics of the *Foot-and-mouth disease virus* from outbreaks in southern Vietnam, 2019. *Virology*, **582**: 43-47. DOI: 10.1016/j.virol.2023.03.010.
19. Ren, X.J., M.G. Yin, Q.Q. Zhao, Z.X. Zheng, H.Y. Wang, Z.J. Lu, X.M. Li, and P. Qian (2023). *Foot-and-mouth disease virus* induces porcine gasdermin e-mediated pyroptosis through the protease activity of 3C(pro). *Journal of Virology*: 17. DOI: 10.1128/jvi.00686-23.
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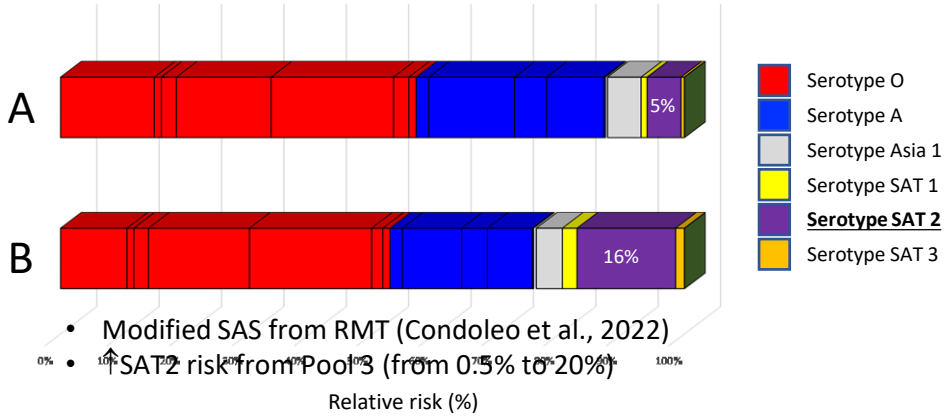
Annex 3: Vaccine recommendations

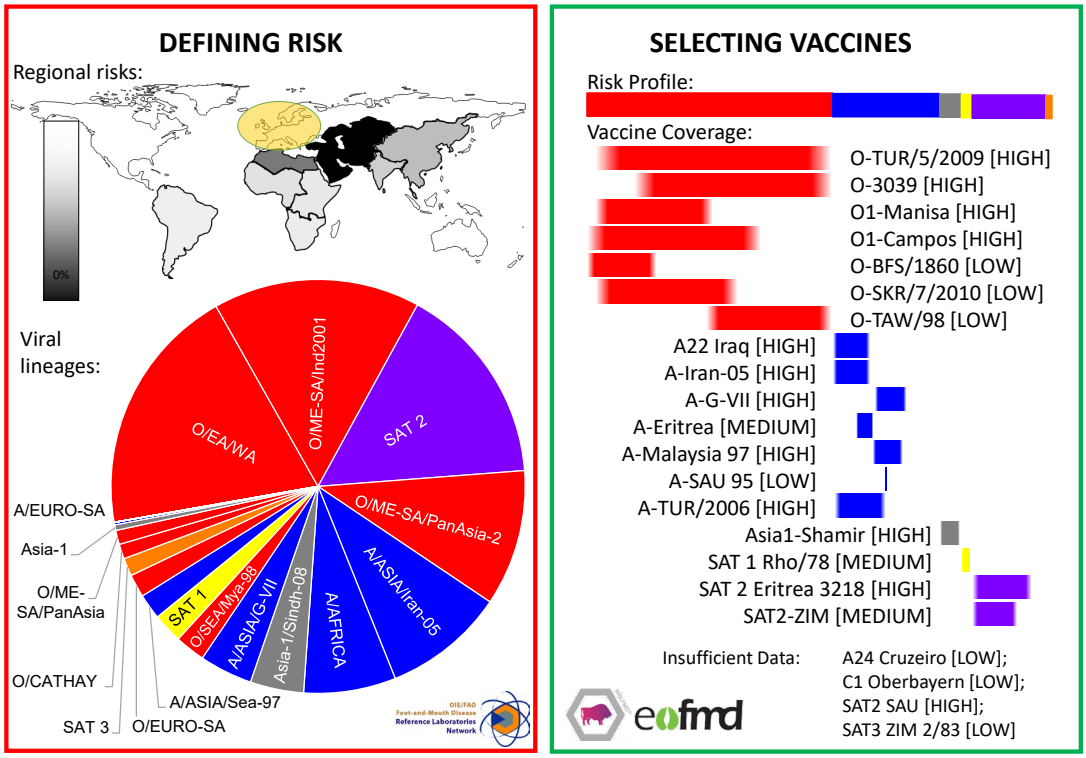
This report provides recommendations of FMDV vaccines to be included in antigen banks. These outputs are generated with a new tool (called PRAGMATIST) that has been developed in partnership between WRLFMD and EuFMD (http://www.fao.org/3/cb1799en/cb1799en.pdf). These analyses accommodate the latest epidemiological 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.

FMD risk profiles for Europe: July 2023:

NB: The two outputs below define FMD risks for Europe which reflect the on-going situation in Pool 3 where FMD cases due to SAT2/XIV have been reported in three countries (Iraq, Jordan and Türkiye). These outputs use Score Area Scores from PRAGMATIST that have been parameterised with data from the FMD EURL meeting in 2017 (A) or the approach describe by Condoleo *et al.*, 2022). The PRAGMATIST figure (below) uses the worst case SAT2 scenario.



- Modified SAS from RMT (Condoleo et al., 2022)
- ↑SAT2 risk from Pool 3 (from 0.5% to 20%)



NB: Analyses uses best available data, however there are gaps in surveillance and vaccine coverage data

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 recently in *Frontiers in Veterinary Science* - see: https://doi.org/10.3389/fvets.2022.1029075.

Condoleo *et al.*, 2022: Risk monitoring tool for FAST diseases (RMT-FAST): a semi-quantitative framework to estimate the risk of disease introduction. EuFMS Open Session, Marseille. (https://www.eufmd.info/os22)

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

Courses

- The EuFMD's Open Access Courses provide convenient self-paced training which you may study anytime, anywhere, free of charge. There are currently 8 courses in English and 1 in Arabic:
  - **Introduction to Foot-and-Mouth Disease** (available in English and French), introducing 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.
  - **Introduction to Lumpy Skin Disease**, a short open-access module made available to support countries in Asia and the Pacific facing this rapidly emerging threat.
  - **Introduction to Rift Valley Fever** aims to build your understanding of Rift Valley fever diagnosis, surveillance, prevention and control.
  - **What is the Progressive Control Pathway** (available in English and, for anyone who is new to the PCP-FMD, a short e-learning module is also available in Arabic) providing 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.
  - **Introduction to the Risk-Based Strategic Plan** introducing the Risk-Based Strategic Plan (RBSP).
- **Public Private Partnerships in the Veterinary Domain** course, developed in partnership with the World Organisation for Animal Health (WOAH), applying public-private partnerships to the control of FMD and similar transboundary animal diseases.
- **Simulation Exercises for Animal Disease Emergencies** (available through FAO eLearning academy) aiming at building your understanding of simulation exercises and their value as part of the emergency preparedness cycle.
- A course on **Introduction to the FMD Minimum Biorisk Management Standards** is currently in development. The virtual course will be open access, will target National Competent Authorities, Institute directors for FMD facilities, biorisk managers and laboratory personnel in laboratories handling infectious FMD. The learning objectives will include introduce the importance, implications and responsibilities of implementing the FMD Minimum Biorisk Management Standards.
- **FMD Emergency Preparation Courses** for veterinarians or those involved in the livestock industry in Foot-and-Mouth Disease (FMD) free countries who would be involved in the diagnosis and investigation of an outbreak of FMD were it to occur.
  - FMD Emergency Preparation Course – Malta. Online, 5th September to 3rd October 2023.
  - FMD Emergency Preparation Course – UK. Online, 12th September to 10th October 2023.
- **PCP-FMD Support Officer (PSO) training – English**, from 19th to 21st September 2023.
- **FAO Global Conference on Sustainable Livestock Transformation** from 25th to 27th September 2023 at FAO headquarters, Rome The event will provide a neutral forum for representatives of FAO Members, producer organizations, research and academic institutions, development agencies, civil society organizations and private sector bodies to engage in dialogues on innovations and pathways to efficiently produce more

nutritious, safe and accessible animal source foods with a reduced environmental footprint, and contribute to vibrant local and diversified livestock systems that are more resilient to shocks and disruptions.

- The **17th Conference of the World Organization Regional Commission for the Middle East** from 30th September to 5th October 2023.
- The **WOAH/FAO FMD Reference Laboratory Network Meeting** form 10th to 12th October 2023
- **Coordination Meeting - EuFMD**, regional FAO Office for the Near East and North Africa and the World Organisation for Animal Health in South-East Mediterranean (Near East) on 12th Octobter 2023.
- **PCP-FMD Support Officer (PSO) training – French**, from 17th to 19th October 2023.
- **Real Time Training in Kenya Induction Course (NTC 33)** from 7th to 10th November in Nakuru, Kenya.
- **Real Time Training in Kenya Induction Course (RTC 2)** from 13th to 15th November in Nakuru, Kenya.

Other resources

Podcasts

We have a constantly updated series of short podcasts relating to the FAST world (http://www.fao.org/eufmd/resources/podcasts/en/).

- The EuFMD has opened the Emergency Toolbox.
- A series of videos on foot-and-mouth disease in English, Bulgarian, Greek and Turkish (https://www.fao.org/eufmd/en/).
- Leaflets on FMD in English, Turkish, Bulgarian and Greek, for the Thrace region (https://www.fao.org/publications/card/en/c/CB4903EN).
- Join our Telegram channel to receive EuFMD updates (https://t.me/eufmd).
- Find out who TOM is and why you need him (https://www.eufmd.info/tom-training).

Emergency Preparedness Network (http://www.fao.org/eufmd/network/en/)

The Emergency Preparedness Network is a forum for emergency preparedness experts to share information and experience. You will regularly receive the latest information on topics related to prevention and control of foot-and-mouth and other similar transboundary animal diseases (“FAST" diseases).

Meetings

- **Executive Committee** (18 October 2023; Online)

Proficiency test scheme organised by WRLFMD

Invitation letters have been dispatched for a new PTS (supported with funding from EuFMD and Defra). Any interested laboratories should contract the WRLFMD for further information. Shipment of panels are expected to commence in September 2023 and progress of this PTS will be described in future quarterly reports.