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MONTHLY REPORT
FOOT-AND-MOUTH DISEASE SITUATION

Food and Agriculture Organization of the United Nations

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eufmd
european commission for the control of foot-and-mouth disease

Foot-and-Mouth Disease Situation
Food and Agriculture Organization of the United Nations
Monthly Report

August 2017

Guest Editor:
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#INFORMATION SOURCES USED:

Databases:
OIE WAHID World Animal Health Information Database
FAO World Reference Laboratory for FMD (WRLFMD)
FAO Global Animal Disease Information System (EMPRES-i)

Other sources:
FAO/EuFMD supported FMD networks
FAO/EuFMD projects and field officers

The sources for information are referenced by using superscripts.
The key to the superscripts is on the last page.

Please note that the use of information and boundaries of territories should not be considered to be the view of the U.N. Please, always refer to the OIE for official information on reported outbreaks and country status.

Contents

Guest Editor's comments:

It's a great privilege and pleasure for me to introduce this month's EuFMD update on the current Global FMD outbreak situation. As highlighted in previous reports, FMD is a highly dynamic disease causing incursions in new geographical areas and almost always changing the pattern of FMD virus distribution. Notable in the dynamics of FMD distribution is the identification of the A/ASIA/GVII lineage which caused outbreaks in Bhutan in March 2017. This serotype A strain had never been encountered in Bhutan before, but had been evolving in India for many years since 1999. It was detected in Saudi Arabia the same year, and then in Iran, Turkey and Armenia. In this year alone, it moved through Israel in May and was identified by WRLFMD sequencing data in August to have caused outbreaks in Nepal, 500 miles from Bhutan's west borders. This Nepal outbreak affected crossbreed cattle and buffaloes collected from different neighbouring districts and international bordering districts.

In Africa, just like in parts of South Asia, the wildlife-livestock interface has continued to influence the occurrence of new outbreaks even in areas where efforts to control the disease have been made. An example is the SAT 1 outbreak in cattle this month in Limpopo, South Africa's FMD protection zone close to Kruger National park. The outbreak was as a result of cattle contact with susceptible species of wild animals and does not affect South Africa's FMD Free zone.

EuFMD has been involved in providing monthly updates which is a vital source of information to help define the global patterns of FMD. To address FMD issues in the global perspective, it is also important to bring together veterinarians from both free and endemic regions. In this respect, FAO/EuFMD carries out FMD Real -time training in Kenya since 2011 and this has led to a total of 26 courses that have been done successfully. Veterinarians from EU member states and Kenya have benefitted from these courses. Particular emphasis is placed on aspects of clinical examination, diagnosis, epidemiological enquiry and biosecurity. E-learning Training materials can be accessed through EuFMD-Training@fao.org

FMD Real -Time Training
Nakuru, Kenya- Feb 2017

Eunice C. Chepkwony, FMD National Reference Laboratory, Kenya

I. GENERAL OVERVIEW

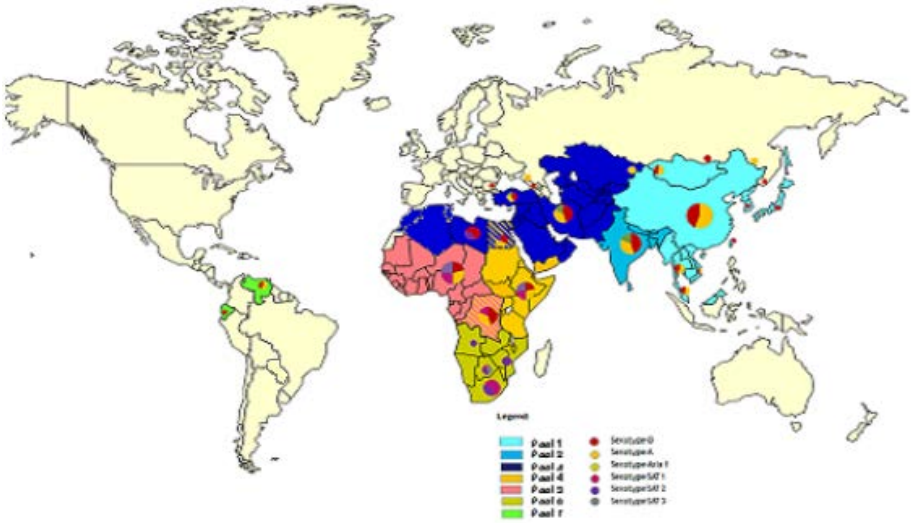
Pools represent independently circulating and evolving foot-and-mouth disease virus (FMDV) *genotypes; within the pools, cycles of emergence and spread occur that usually affect multiple countries in the region. In the absence of specific reports, it should be assumed that the serotypes indicated below are continuously circulating in parts of the pool area and would be detected if sufficient surveillance was in place (Table 1).*

Table 1: List of countries representing each virus pool for the period 2011 – 2016 (source EuFMD)

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

Egypt, Libya and **Democratic Republic of Congo** (highlighted in bold) are indicated as being in multiple pools, since they have evidence of FMDV originating from 2 or more pools in the past four years. * ONLY IN NORTH ZAMBIA AS SPILL-OVER FROM POOL 4

MAP 1: Foot-and-mouth disease (FMD) virus pools: world distribution by serotype in 2011-2016 (source EUFMD)



II. HEADLINE NEWS

POOL 1- SOUTHEAST ASIA/CENTRAL ASIA/EAST ASIA

Cambodia [1] – Field isolates belonging to FMDV serotypes A and O, detected in the samples collected in December 2016 for which host species was not reported, were subjected to vaccine matching strain differentiation (VMSD) tests which identified good matching results with some of the vaccine strains employed.

Mongolia [2] – FMD outbreaks that occurred from April to August 2017, involving different species were reported as a continuation of the outbreak, which started in January 2017. These last events respectively occurred at Dornogovi and Dundgovi that are in the Central Mongolia.

Myanmar [1] - FMDV detected in bovine samples collected in January and May 2017 and genotyped as O/ME-SA/Ind-2001d were subjected to VMSD tests which identified vaccine strains with good matching results.

POOL 2 - SOUTH ASIA

Buthan [1, 3]

FMDV serotypes A and O were detected in a batch of samples collected between March and July 2017. The lineage to which the serotype A belongs is A/ASIA/G-VII and this is the first report of its circulation in this country.
FMD outbreaks continue to occur in July 2017 in Tsento Gewog, following those of the previous month in gewogs Tsento, Lango, Dopshri and Hungrel of Paro District, Bhutan.

India [3, 4]

Since May 2015, the Indian Council of Agricultural Research - Directorate of Foot and Mouth Disease (ICAR-PDFMD), Mukteswar, India continues to solely detect FMDV serotype O as is also the case for the reporting month.
Deaths in cattle due to FMD were reported during June 2017, in Kangpokpi, Manipur State.

Nepal [1, 2, 5]

The National Foot and Mouth Disease and TADS Laboratory reported the circulation of FMDV serotype A and O which were also those detected by the WRLFMD in the 26 bovine samples forwarded by the same laboratory.
The FMDV serotype A refers to A/ASIA/G-VII, which even for this country represents a new introduction and was responsible for the outbreak reported on April 2nd 2017, involving cattle and buffaloes in various holdings in Narayani.

POOL 3 - WEST EURASIA & MIDDLE EAST

Afghanistan [6] - The Central Veterinary Diagnostic and Research Laboratory *(*CVDRL) of Kabul Afghanistan detected FMDV serotypes A, ASIA 1 and O in the 72 samples examined during August 2017.

Egypt [1] – The FMDVs detected in the set of buffalo and bovine samples collected between November 2016 and April 2017 were respectively genotyped as A/AFRICA/G-VI and O/EA-3.

Pakistan [7]- The 11 FMD outbreaks reported during August 2017 in some of the territories of the country were caused by serotypes A, Asia 1 and O.

POOL 4 - EASTERN AFRICA

Kenya [8] - FMDV serotypes O and SAT 1 were detected in the bovine samples examined by the FMD National Reference Laboratory, Embakasi.

POOL 5 - WEST/CENTRAL AFRICA

Cameroon [9] - The Laboratoire National Vétérinaire (LANAVET), Garoua detected FMDV in 13 of the 62 bovine samples examined.

POOL 6 - SOUTHERN AFRICA

Namibia [2] – Another outbreak was reported on July 27th 2017 following the two FMD episodes, which occurred in cattle during the same month at Katima-Mulilo, Zambezi.

South Africa [2] – FMD outbreaks due to SAT 1 and SAT 2 were respectively reported in cattle, in August 2017 at Limpopo and between March and April 2017 at Mpumalanga.

Zimbabwe [2] – Eleven FMD outbreaks for which serotyping is still pending occurred between July 21st and August 16th 2017 in Masvingo and Manicaland.

POOL 7 - SOUTH AMERICA

Columbia [2] **–** Another outbreak was reported on July 19th at Norte de Santander, further to the other outbreaks due to serotype O that was first detected at La Marota, Curipao, Tame, Arauca, Columbia on June 11th and followed by those which took place between June 1st of and July 20th 2017 in Cundinamarca and Norte de Santander.

Rest of Latin America [2, 10, 11] **-** Last registered circulation of FMD in Latin America before the above-mentioned events was announced during the OIE/FAO FMD Laboratory Meeting held in November 2016, where PANAFTOSA reported sequence data for historical FMD outbreaks that occurred in Venezuela in 2013.

COUNTER

****** 156 MONTHS SINCE THE LAST SEROTYPE C OUTBREAK WAS REPORTED***

III. DETAILED POOL ANALYSIS

A. POOL 1 – *SOUTHEAST ASIA/CENTRAL ASIA/EAST ASIA*

Cambodia [1]

Field isolates A/CAM/4 and 5/2015 and O/CAM/1 and 3/2016, respectively genotyped as A/ASIA/Sea 97 and O/ME-SA/PanAsia, obtained the following results in the VMSD tests:

For serotype A, good matching results were obtained for vaccine strains A/MAY/97 and A22 IRQ but not for A Iran 2005 and A TUR 20/16;

For serotype O, good matching results were obtained for vaccine strains O 3039 and O TUR 5/09 but not for O Manisa.

Mongolia [2]

Four FMD outbreaks that occurred between April and August 2017, involving different ruminant species, were reported as a continuation of the episode, which started in January 2017 due to FMDV serotype O. Diagnosis was confirmed by the WRLFMD on June 12th 2017. A summary of the animals involved and location of the outbreaks are reported in Table 2 and Map 2.

Control measures in place are the following: movement control inside the country screening, quarantine, stamping out, zoning, and disinfection. No treatment is being administrated to affected animals while vaccination in response to the outbreak was applied as reported in Table 3. Information on vaccine composition and period of administration is not available.

Table 2: summary of the animals involved in the FMD outbreaks that occurred between April and August 2017 at Dornogovi and Dundgovi, Mongolia. (source – WAHIS)

Species	Susceptible	Cases	Deaths	Killed and disposed of	Slaughtered	Apparent morbidity rate	Apparent mortality rate	Apparent case fatality rate	Proportion susceptible animals lost*
Cattle	/	91	0	91	0	**	**	0.00%	**
Goats	/	84	0	84	0	**	**	0.00%	**
Sheep	/	127	0	127	0	**	**	0.00%	**

*Removed from the susceptible population through death, destruction and/or slaughter

**Not calculated because of missing information

Map 2: location of the four FMD outbreaks that occurred between April and August 2017 at Dornogovi and Dundgovi, Mongolia (source - WAHIS)

Table 3: vaccination held in response to the outbreaks that occurred in Mongolia as reported in Map 2. (Source – Wahis)

Administrative division	Species	Vaccinated
DORNOD	Cattle	166,526
	Goats	290,011
	Sheep	478,584
KHENTII	Cattle	177,056
	Goats	483,809
	Sheep	764,176
SUKHBAATAR	Cattle	206,012
	Goats	973,009
	Sheep	1,523,375
Total		**5,062,558**

Myanmar [1]

Good matching results with O 3039, O Manisa and O Tur 5/09 were obtained for field isolate O/MYA/5/2017, but not for O/MYA/1/2017. Both viruses were genotyped as O/ME-SA/Ind-2001d and were detected in bovine samples collected in the country between January and May 2017.

Russian Federation [12]

In support of the post-vaccination monitoring phase, the Russian Federation Regional Reference Laboratory for FMD (FGBI-ARRIAH) examined 6,243 serum blood samples for the detection of FMDV antibodies.
The FGBI-ARRIAH continues to provide support to the Federal Service for Veterinary and Phytosanitary Surveillance of the Ministry of Agriculture of the Russian Federation and to the Veterinary Services of the Russian Federation by respectively supplying materials and technical advice.

Table 4: Summary of the history of FMD Pool 1, 2012 – 2017, for geographic distribution see Map 3 below. (Source – Wahis, EuFMD Global Monthly Report)

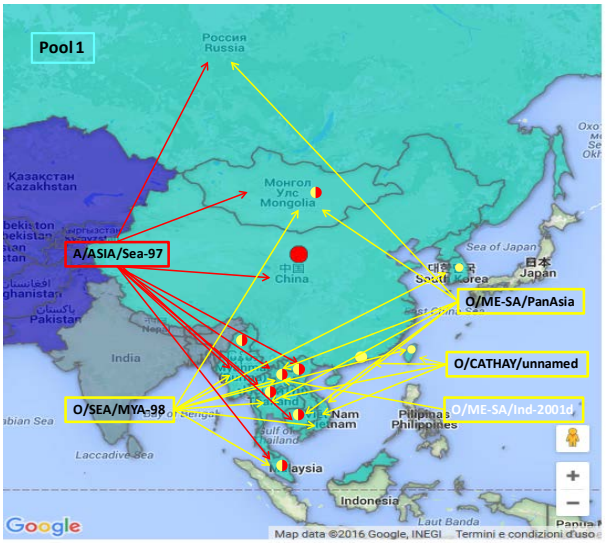
COUNTRY	FMD HISTORY FMDV serotypes, reported to OIE between 2012 – 2016 **(1st semester 2016)	LAST OUTBREAK REPORTED/SEROTYPE # see pg. 1	Comment
Cambodia	PENDING/2013-2016 O, A/2016, NOT SAMPLED, (ASIA /2016)	Dec 2016/ A & O	**See text**
China	Data up to 1st semester 2015 2013 & 2015/A, 2012-2013/O, 2012 -2014/NOT TYPED	May 2017/A and O	Follow-up needed
China, Hong Kong, SAR	O	Aug 2016/O	Follow-up needed
Democratic People's Republic of Korea	O/2016 2012-2013/DISEASE ABSENT 2014 & 2015/ NO DATA REPORTED	May 2014/not confirmed, July 2014/O	Follow-up needed
Lao People's Democratic Republic	Data up to 1st semester 2015) A, O/2015 2012/DISEASE PRESENT WITH QUANTITATIVE DATA BUT	Jan 2017/O Mar 2015/A,	Follow-up needed

	WITH AN UNKNOWN NUMBER OF OUTBREAKS		
Malaysia	A/2016, 2012 –2016/O, 2013 & 2015/NOT TYPED	August 2016/A & O	Follow-up needed
Mongolia	Disease Absent /2016**, 2014 & 2015/O, 2013/A & NOT TYPED	Aug 2017/O, Sept 2017/A,	**See text**
Myanmar	2012-2016/O, 2015/A & NOT TYPED	April 2017/Asia 1 & O, July 2016/ not typed, Oct 2015/A	**See text**
Republic of Korea	Data up to 1st semester 2015 2014 -2015/O, 2012-2013/DISEASE ABSENT	Feb 2017/O & A	Follow-up needed
Russian Federation	2013 – 2016**/A, 2012, 2014 & 2015/O	Dec 2016/O, Oct 2016/Asia 1, Jan 2016/ A	**See text**
Taiwan Province of China	2016/NO DISEASE PRESENT A/2015, 2012-2013/O	Jun 2015/A	Follow-up needed
Thailand	O, A NOT SAMPLED & NOT TYPED	Feb 2017 /A, Jan 2017/O June – July 2016/not typed	Follow-up needed
Viet Nam	O, NOT SAMPLED, NOT TYPED 2013-2016/A	November 2016/A, Oct 2016/O and not typed	Follow-up needed

Map 3: FMD distribution by serotype and topotype in South East Asia, 2012 – 2016 – white script in map refers to new introduction of viral lineage in pool or country of the pool during 2016. (source – Google Fusion Maps, WRLFMD).

Conjectured circulating FMD viral lineages in Pool 1 per 2016 [1, 11]:

- Serotype O: O/SEA/Mya-98, O/ME-SA/PanAsia, O/CATHAY, O/ME-SA/Ind-2001d (new detection in Myanmar and Thailand during 2016)
- Serotype A: A/ASIA/Sea-97 and Iran-05[SIS10] sublineage
- Serotype Asia-1 – reappearance of this serotype in 2016 in Russia where the virus was closely related to a vaccine strain Shamir – previous detection in the region was in 2006 in Vietnam and in China (People's Rep. of)



B. POOL 2 – South Asia

Buthan [1]

The National Centre for Animal Health of the Department of Livestock at Thimpu, Bhutan forwarded 22 samples, collected between March and July 2017, from one pig and the remaining from cattle, with the detection of FMDV serotype A in one sample and serotype O in 15 samples which were respectively genotyped as A/ASIA/G-VII and O/ME-SA/Ind-2001d. This represents the first report of the presence of A/ASIA/G-VII in the country.

FMD outbreaks continue to occur in July 2017 affecting cattlein Tsento Gewog. Health officials report that calves are those most affected owing to a scarce or absent immunity. Vaccination is being administered to the livestock that are not affected. The farmers were economically affected, as there was a ban on the sale of milk and dairy products and on the movement of animals. The livestock officers are conducting awareness campaigns.
FMD also occurred in the previous month in the gewogs of Tsento, Lango, Dopshri and Hungrel of Paro District, Bhutan.

India [3, 4]

ICAR-PDFMD, Mukteswar, India continues to detect the sole presence of FMDV serotype O. During the reporting month, this serotype was again detected in the five cattle samples tested for FMDV antigen and/or RNA detection. The laboratory submitted four field isolates, again positive for serotype O, for genotyping and five isolates were subjected to vaccine matching tests. The laboratory also conducted the analyses of 1,298 sera for the detection of FMD antibodies in the course of epidemiological studies.
The laboratory continues to be involved in the field investigations of FMD outbreaks and in providing expert advice to the Government and to the National and Local authorities. The institution also has ongoing research studies and collaborations with international organisations.
Cattle have died of FMD in an outbreak in Twilang area Manipur. The event started in early June and treatment and vaccination was provided to the sick and susceptible animals.

Nepal [1, 2, 5]

The National Foot and Mouth Disease and TADS Laboratory reported the circulation of FMDV serotype A and O that were also detected by the WRLFMD in the 26 bovine samples forwarded by the same laboratory.
Of the total, three (11.53%) were positive for serotype A and seven (26.92%) for serotype O were while 11 (42.31%) of the remaining samples were positive for FMDV genome but without successful serotyping and five (19.23%) were negative.
The genotyping results relative to these samples are summarised in Table 5 and location of collection of samples in Map 4.

Table 5: summary of the genotyping results relative to a set of bovine samples collected between January and May 2017 in Nepal. (Source – WRLFMD)

Sample Identification	Location origin of sample	Host species	Date of collection	Genotype	Most Closely Related Viruses not belonging to the country - Seq id %	Host species
NEP/12/2017	Chitwan	cattle	06/04/2017	**A/ASIA/G-VII**	PD78/IND/2015 (97.9)	/
NEP/13/2017						
NEP/14/2017						
NEP/3/2017	Ramechhap		20/01/2017	**O/MEA-SA/Ind-2001d**	/	
NEP/4/2017	Kathmandu		26/01/2017			
NEP/8/2017	Chitwan		13/03/2017			
NEP/10/2017	Rasuwa		15/03/2017			
NEP/22/2017	Nawalparasi		03/05/2017		SAU/2/2016 (>96.2)	bovine
NEP/23/2017						
NEP/24/2017						

Map 4: location of the set of bovine samples collected between January and May 2017 in Nepal and genotyped by the WRLFMD. (Source – WRLFMD and Google Fusion Maps)

This is the first report of the circulation of A/ASIA/G-VII in the country, responsible of the outbreak reported on April 2nd 2017 involving cattle and buffaloes on four animal holdings in Narayani. A summary of the animals involved and location of the outbreak are presented in Table 6 and Map 5.

The National Foot and Mouth Disease and TADS Laboratory confirmed the outbreak on April 6th 2017 and the virus was subsequently genotyped as reported above by the WRLFMD. The outbreak was reported as resolved on May 3rd 2017.

The source of outbreak was attributed to the illegal movement of animals. Both young and adult animals presented typical signs of FMD, represented by high fever, drooling of saliva, chomping of jaws, lesions on tongue, lameness and off feed, even if no mortality was registered among the sick animals. The animals had not received any vaccination against FMD in the past year. Close to this episode, there was a buffalo collection and an animal selling centre as well as a herd of buffaloes consisting of animals from different neighbouring and international bordering districts. Further investigations are ongoing to determine the origin of the outbreak.

Control measures in place are movement control inside the country, surveillance within and outside containment and/or protection zone, quarantine, disinfection, vaccination permitted if available and no treatment to affected animals is being administered.

Table 6: summary of the animals involved in the FMD outbreak that occurred on April 6th 2017 at Narayani, Nepal. (source – WAHIS)

Species	Susceptible	Cases	Deaths	Killed and disposed of	Slaughtered	Apparent morbidity rate	Apparent mortality rate	Apparent case fatality rate	Proportion susceptible animals lost*
Cattle	17	17	0	0	0	100.00%	0.00%	0.00%	0.00%
Buffaloes	3	3	0	0	0	100.00%	0.00%	0.00%	0.00%
Total	**20**	**20**	**0**	**0**	**0**	**100.00%**	**0.00%**	**0.00%**	**0.00%**

Map 5: location of the FMD outbreak that occurred on April 6th 2017 at Narayani, Nepal. (source – WAHIS)

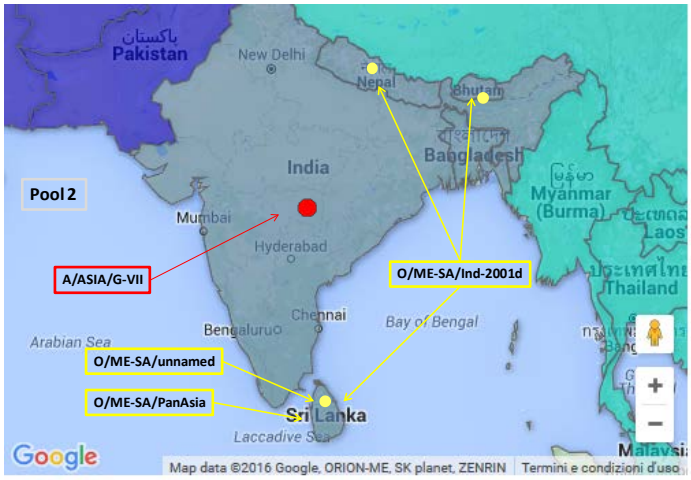
Table 7: Summary of the history of FMD Pool 2, 2012 – 2017, for geographic distribution see Map 6 below. (Source – Wahis, EuFMD Global Monthly Report)

COUNTRY	FMD HISTORY FMDV serotypes, reported to OIE between 2012 – 2016 **(1st semester)	LAST OUTBREAK REPORTED/SEROTYPE # see pg. 1	Comment
Bangladesh	NO DATA AVAILABLE/2016, DISEASE PRESENT BUT WITHOUT QUANTITATIVE DATA	Dec 2016/A, ASIA 1 and O	Follow-up needed
Bhutan	2013-2016/O, NOT TYPED or NOT REPORTED 2013 & 2014/NOT SAMPLED	July 2017/O, April 2017/A, May 2017/Untyped,	**See text**
India	NO DATA AVAILABLE/2016, O, A, NOT SAMPLED 2012-2014/Asia 1 2013/NOT TYPED	July 2017/O, Apr 2015/A Asia 1	**See text**
Mauritius	DISEASE ABSENT	Sep 2016/0	Follow-up needed
Nepal	O, 2012-2103/Asia 1	May 2017/O, April 2017/A	**See text**
Sri Lanka	2015 -16/NO DATA REPORTED, 2012 – 2014/O	2016/O	Follow-up needed

Map 6: FMD distribution by serotype and topotype in South Asia, 2012 – 2016 (source – Google Fusion Maps, WRLFMD).

Conjectured circulating FMDV lineages in Pool 2 per 2016 [1, 11]:

- O/ME-SA/Ind-2001d predominates (the O/ME-SA/Ind-2011 lineage that emerged during 2011 has not been recognized during 2012-15), outbreaks of this serotype detected in Mauritius during 2016 (**not reported in Map**)
- O/ME-SA/PanAsia-2 (last detected in 2011 in Sri Lanka)
- A/ASIA/G-VII (genotype 18)
- Asia-1 (lineage C subdivided into Eastern and Western clusters) – not reported in map



C. POOL 3 – <u>West Eurasia & Middle East</u>

Afghanistan [6]

The Central Veterinary Diagnostic and Research Laboratory *(*CVDRL), of Kabul Afghanistan detected FMDV serotypes A (24.14%), ASIA 1 (4.08%) and O (40.82%) in the 72 samples examined during August 2017. In addition, serotyping was not achieved for 11 of these FMDV positive samples. The distribution of the serotypes among the samples examined is reported in Graph 1 while the country location of the positive samples is reported in Map 7, 8 and 9.

The laboratory successfully conducted the optimization of the sensitivity of a FMD multiplex real time RT-PCR test employing a panel of positive samples with low signals to improve the quality of the test results.

The laboratory personnel was involved in the investigation a FMD outbreak in sheep were sampling was carried out. Further information provided by the laboratory, is that in spite of the circulation of FMDV in Lam no outbreak has until now been reported on vaccinated farms. Also, in some provinces, such as Herat, where many cattle farms are present, serotypes O and Asia1 were simultaneously detected.

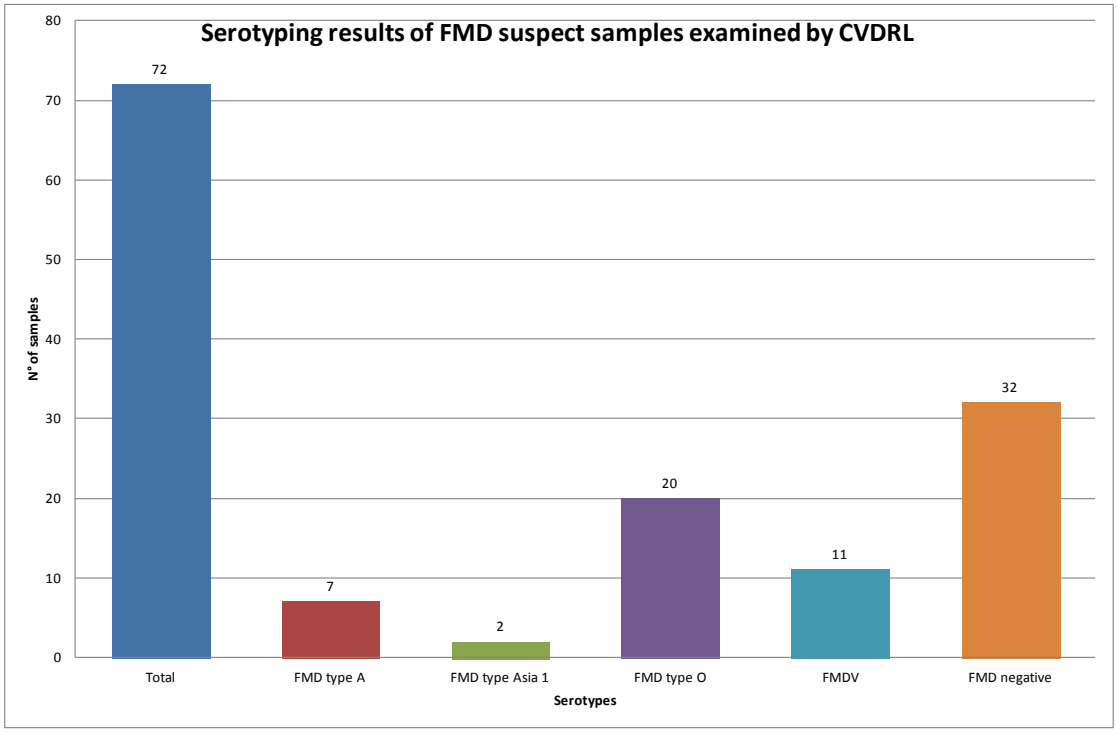
The preliminary results obtained by the WRLFMD for the set of 38 samples forwarded for genotyping are as follows:

The nine samples containing serotype A belong to lineage A05 IRN, sublineages SIS-13 and FAR-11 with no detection of A/ASIA/G-VII lineage was detected.

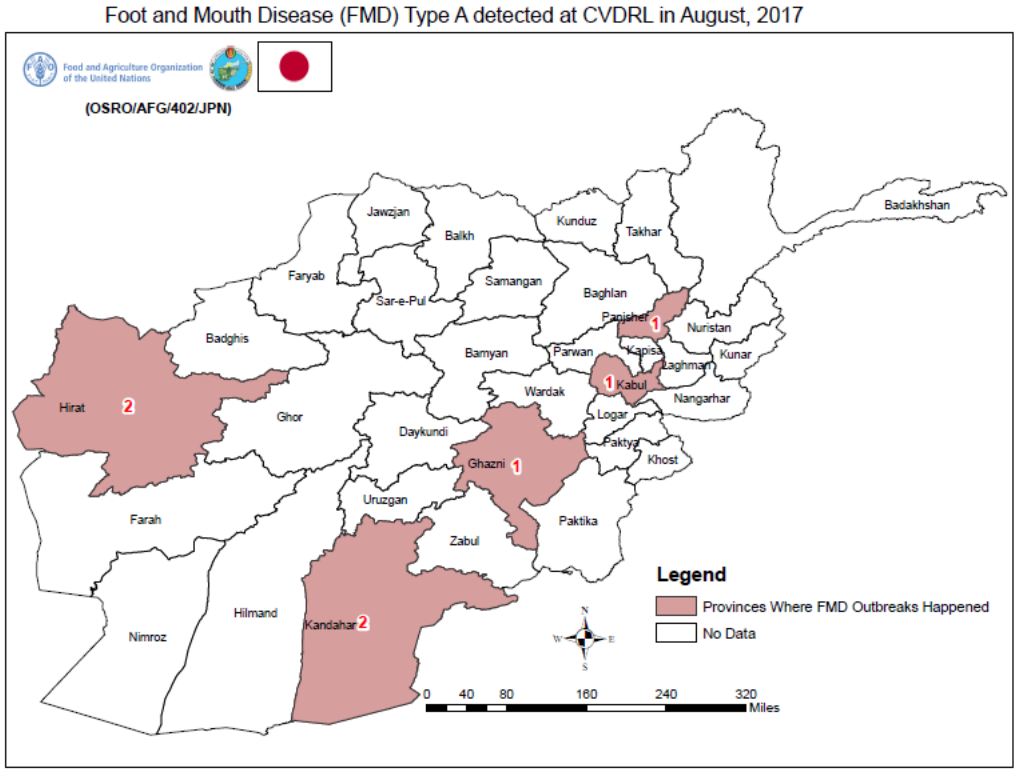
The two samples containing serotype Asia1 detected were sequenced as Sindh-08.

The five samples containing serotype O detected were sequenced as lineage PanAsia-2, sublineage ANT-10.

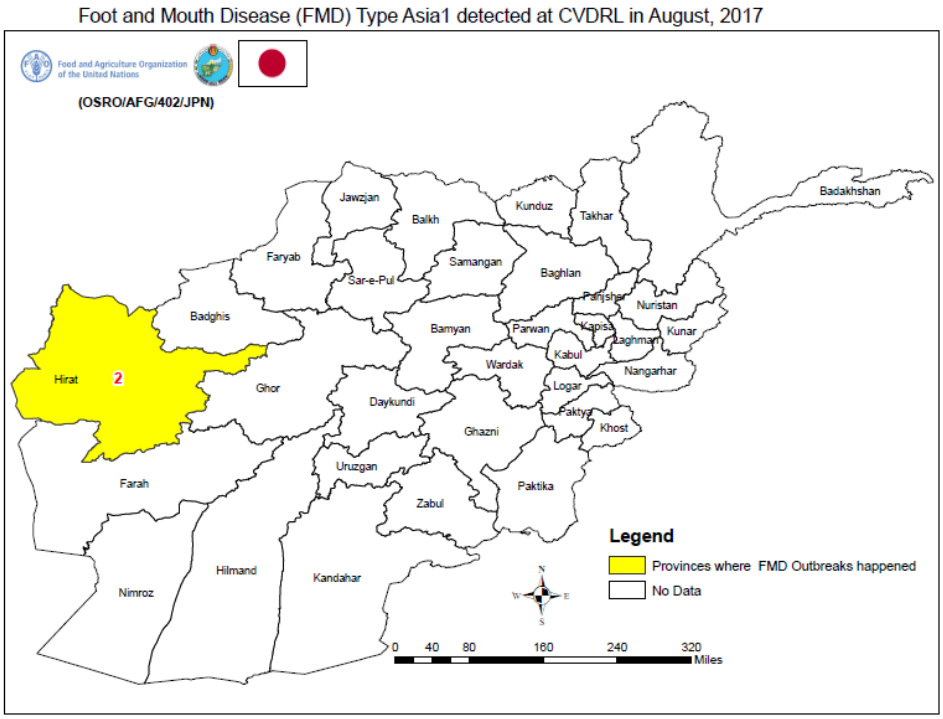
Graph 1: relative distribution of the FMDV serotypes among the samples collected in the different provinces of Afghanistan during August 2017. (Source – CVDRL, Afghanistan)



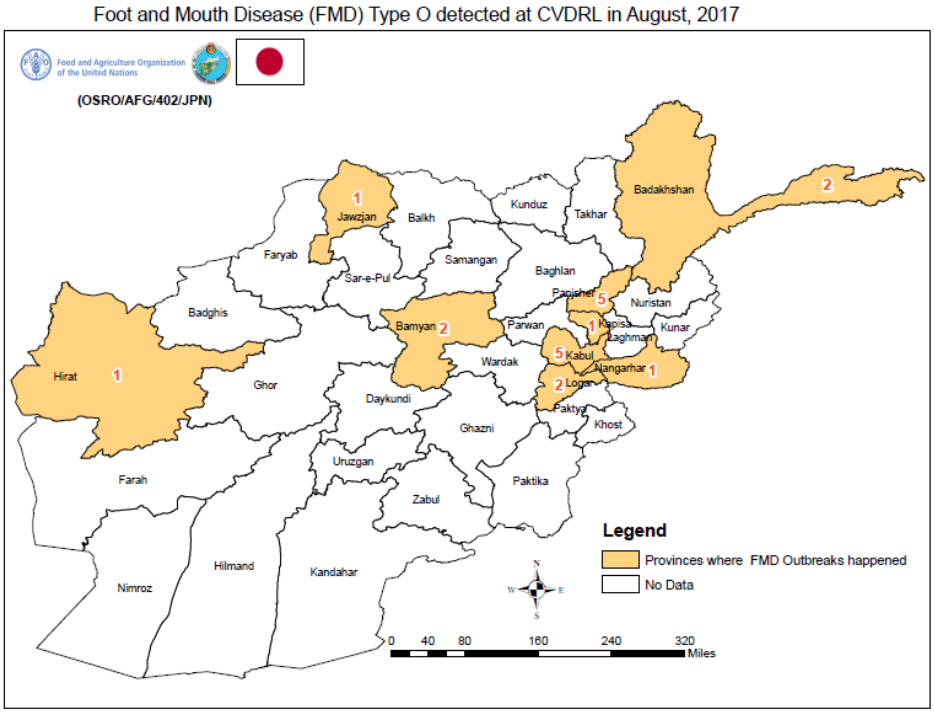
Map 7: (Source – CVDRL, Afghanistan)



Map 8: (Source – CVDRL, Afghanistan)



Map 9: (Source – CVDRL, Afghanistan)



Egypt [1]

A batch of 35 biological samples (4 from buffaloes and 31 from cattle) collected between November 2016 and April 2017 were positive for FMDV serotypes A (1 – 2.86%) and O (21 – 60%), while the remaining samples were either positive for the FMDV genome without serotyping achieved (10 – 28.57%) or negative (3 – 8.57%). The serotypes were respectively genotyped as A/AFRICA/G-VI and O/EA-3. A summary of the genotyping results are represented in Table 8, while location of where the samples were collected is reported in Map 10. The O/EA-3 sequences from Egypt are very closely related to sequences from outbreaks this year in the Gaza Strip, the West Bank and Israel.

Table 8: summary of the genotyping results relative to the bovine and water buffalo samples collected between November 2016 and April 2017 in Egypt. (Source – WRLFMD)

Sample Identification	Location origin of sample	Host species	Date of collection	Genotype	Most Closely Related Viruses not belonging to the country - Seq id %	Host species
EGY/19/2016	Giza	cattle	07/11/2016	**A/AFRICA/G-VI**	ETH/19/2015 (97.5)	
EGY/4/2017	Nabaroh, Dakahlia	water buffalo	30/01/2017			
EGY/6/2017	Elraed, Ganain, Suez	cattle	04/02/2017			
EGY/7/2017	Tolombat, Baniebed, Dakahlia	cattle	05/02/2017			
EGY/8/2017	Sandahor, Banha, Qualubia	cattle	06/02/2017			
EGY/9/2017	Awesh, Mansora, Dakahlia	cattle	12/02/2017			
EGY/10/2017	Sela, Fayoum, Fayoum	water buffalo	13/02/2017			
EGY/11/2017	Berkaelsab, Monofia	water buffalo	14/02/2017			
EGY/13/2017	Grees, Ashmon, Monofia	cattle	15/02/2017			
EGY/16/2017	Entag Farm, Nobaria, Alexandria	cattle	22/02/2017			
EGY/17/2017	Shalofa, Ganain, Suez	cattle	27/02/2017			
EGY/19/2017	Aish, Ganob, Port Said	cattle	08/03/2017	**O/EA-3**	PAT/2/2017 (>99.2 - 99.8)	cattle
EGY/21/2017	Abodraz, Fowa, Kafr El Sheikh	cattle	13/03/2017			
EGY/22/2017	Kilo 17, Ganob, Port Said	water buffalo	19/03/2017			
EGY/25/2017	El Rabeaa, Meet Sweb, Dakahlia	cattle	30/03/2017			
EGY/26/2017	Abodraz, Fowa, Kafr El Sheikh	cattle	01/04/2017			
EGY/27/2017	Banimohamed, Etaelbarod, Behaira	cattle	05/04/2017			
EGY/28/2017	Kalamon, Dakhla, New Vally	cattle	11/04/2017			
EGY/30/2017	Ezab Kasr, Dakhla, New Vally	cattle	15/04/2017			
EGY/31/2017	Borg Elarab, Alexandria	cattle	16/04/2017			
EGY/32/2017	Fowa, Kafr El Sheikh	cattle	18/04/2017			
EGY/33/2017	Elsaraw, Faraskor, Domiatte	cattle	23/04/2017			

Map 10: location of the set of bovine and water buffalo samples collected between November 2016 and April 2017 in Egypt and genotyped by the WRLFMD. (Source – WRLFMD and Google Fusion Maps)

Pakistan [7]

Eleven FMD outbreaks were reported during August 2017 in some areas of the country that were caused by serotypes A, Asia 1 and O. The distribution of FMDV serotypes relative to the outbreaks and location of these in the different provinces is reported in Table 9 and Map11. Ring vaccination was also carried out in three provinces as reported in Table 10, two of which were the ones registering outbreaks for the reporting month, i.e. in Azad Kashmir and Punjab.

The project that is currently operated only Punjab and FMD information relative to AJK and ICT is provided on voluntarily basis.

Table 9: summary of the FMD outbreaks reported in Pakistan during August 2017. (source – Progressive Control of Foot and Mouth Disease in Pakistan, *Dr. Muhammad Afzal*, Project Coordinator)

Province	District	Number Outbreaks				
		Subtotals	'O'	'A'	'Asia-1'	Un-Typed
Azad Kashmir	Mirpur	7	2	--	2	3
Punjab	Okara	1	1	--	--	--
	Shaikhupura	3	--	3	--	--
Total		**11**	**3**	**3**	**2**	**3**

Table 10: summary of the vaccination activities conducted in some provinces of Pakistan during August 2017. (source – Progressive Control of Foot and Mouth Disease in Pakistan, *Dr. Muhammad Afzal*, Project Coordinator)

Province	Ring Vaccination (Doses)
Punjab	600
Azad Kashmir	500
Islamabad Capital Territory	250
Total	**1,350**

Map 11: location of the FMD outbreaks reported in Pakistan during August 2017. (source – Google Fusion Maps, Progressive Control of Foot and Mouth Disease in Pakistan, *Dr. Muhammad Afzal*, Project Coordinator)

Palestinian [2]

The outbreak, which started on May 1st 2017 due to serotype O was reported as resolved on August 1st 2017. Control measures applied were the following: surveillance within and outside containment and/or protection zone, screening, traceability, quarantine, zoning and disinfection. No treatment was provided to the affected animals. Vaccination was administered to 9,846 cattle and to 97,924 sheep and goats. Details of the type of vaccine employed were not provided.

Table 11: Summary of the history of FMD Pool 3, 2012 – 2017, for geographic distribution see Map 12 below. (Source – Wahis, EuFMD Global Monthly Report)

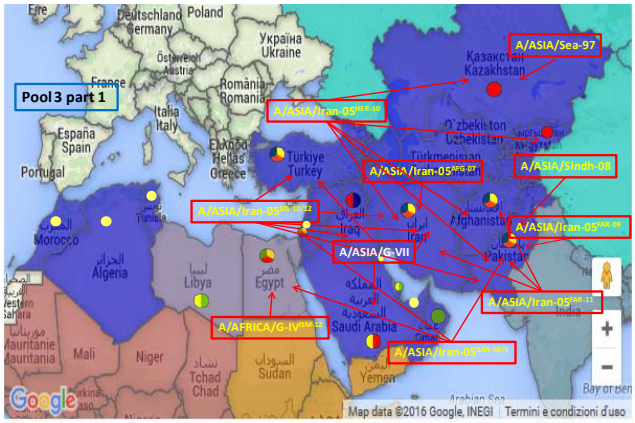
COUNTRY	FMD HISTORY FMDV serotypes, reported to OIE in 2012 – 2016 **(1st semester)	LAST OUTBREAK REPORTED/SEROTYPE # see pg. 1	Comment
Afghanistan	2013-2016**/O, A, Asia 1, NOT TYPED 2012/SEROTYPE NOT REPORTED	Aug 2017/A, Asia 1 & O	**See text**
Algeria	Data available up to 1st semester 2015 2014 -2015/O	Apr 2017/A, Apr 2015/O	Follow –up needed
Armenia	2015 -2016**/A , 2012-2014/DISEASE ABSENT	Dec 2015/A	Follow –up needed
Azerbaijan	DISEASE ABSENT	2007/0	Follow –up needed
Bahrain	DISEASE ABSENT/2016, 2012, 2014 &2015 /O	Mar 2015/O	Follow –up needed
Egypt	2012, 2014, 2016**/SAT 2 2012 – 2016**/O, A	April 2017/O, Nov 2016/A May-Jun 2016/Sat 2, Aug 2016/typing pending	**See text**
Georgia	DISEASE ABSENT	2001/ASIA 1	Follow –up needed
Iran (Islamic Republic of)	2012-2016/A, Asia 1 & O	Feb 2017/A & O, 2013/Asia 1	Follow –up needed
Iraq	2015-16/O, 2012-2016/A 2015/ SEROTYPE NOT REPORTED, 2012-13	Dec 2013/A, ASIA 1	Follow –up needed

Israel	2012-2015**/O	May 2017/A & O	Follow –up needed
Jordan	DISEASE ABSENT	Mar 2017/O, 2006/A	Follow –up needed
Kazakhstan	2014-2016**/ DISEASE ABSENT, 2012/O,2012 –2013/A	Jun 2013/ A & Aug 2012/O	Follow –up needed
Kuwait	O/2016 2013 – 2014/ DISEASE ABSENT, 2012/O	April 2016/O	Follow –up needed
Kyrgyzstan	2015 -16/ DISEASE ABSENT, 2012-2014/O, A	Aug 2014/not typed & Apr 2013 /O, A,	Follow –up needed
Lebanon	DISEASE ABSENT/2016**, 2015/ NO DATA REPORTED	2010/not typed	Follow –up needed
Libya	NO DATA REPORTED	Oct 2013/O	Follow –up needed
Morocco	2012-14,2016**/DISEASE ABSENT, O/2015	Oct 2015/O	Follow –up needed
Oman	2016/ NO DATA REPORTED, 2012-2015/O	May 2015/SAT 2	Follow –up needed
Pakistan	2012 & 2015-16/ NO DATA REPORTED 2013-2014/A, ASIA 1 & O	Aug 2017/ A, Asia 1 & O	**See text**
Palestine	O, 2012-2013/SAT 2	Jun 2017/serotying pending May 2017/O, Mar 2013/Sat 2	**See text**
Qatar	NO DATA AVAILABLE/2016 2012-2015/O	Dec 2013/O	Follow –up needed
Saudi Arabia	2012-2014, 2016**/O A/2015	Oct 2016/A & April 2016/O	See text Follow –up needed
Syrian Arab Republic	DISEASE ABSENT**	2002/ A & O	Follow –up needed
Tajikistan	2016/ NO DATA REPORTED 2014-2015**/DISEASE ABSENT 2012- 2013/NOT TYPED	Nov 2012/ not typed & Nov 2011/Asia 1,	Follow –up needed
Tunisia	2015-16**/ DISEASE ABSENT, 2014/O	April 2017/A, Oct 2014/O	Follow –up needed
Turkey	A & O, NOT TYPED Asia 1/2012-15	Oct 2015/ A May, 2014-2015/ Asia 1 and O	Follow –up needed
Turkmenistan	2013-2016**/DISEASE ABSENT, 2012/NO DATA REPORTED	Not available	Follow –up needed
United Arab Emirates	O/2016 2012, 2015/DISEASE ABSENT 2013-2014/O	Sep 2016/O	Follow –up needed

Map 12 : FMD distribution by serotype and topotype for West Eurasia and Middle East, 2012 – 2016 - white script in map refers to new introduction of viral lineage in pool or country of the pool during 2016. (source – Google Fusion Maps, WRLFMD).

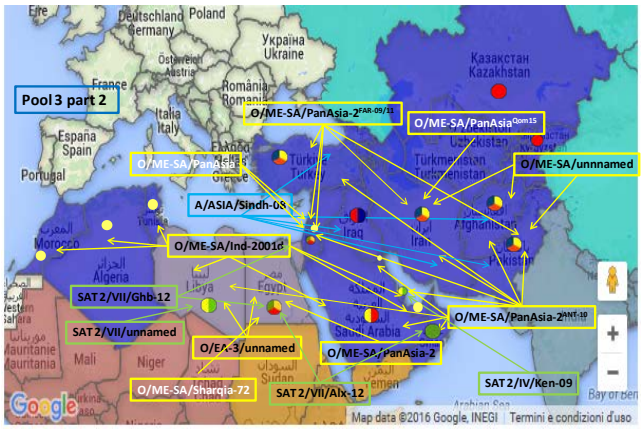
Conjectured circulating FMDV serotype A lineages in Pool 3 per 2016 [1, 11]:

- A/ASIA/Iran-05 (from AFG-07, HER 10, SIS-10/12, FAR-09/11 and BAR-08 sub-lineages)
- A/Asia/G-VII (recent incursion from South Asia - detected also in Iran in 2016)
- A/ASIA/Sea-97
- A/ASIA/Sindh-08
- A/AFRICA/G-IV
- Asia-1 (Sindh-08 lineage).



Conjectured circulating FMDV serotype O and SAT 2 lineages in Pool 3 **(cont'd)**

- O/ME-SA/PanAsia-2 (predominantly from ANT-10 and FAR-09 /11 sub-lineages)
- O/ME-SA/Ind-2001 (recent incursions per 2013/14 from the Indian sub-continent)
- New detection during 2016 of O/ME-SA/Sharqia-72 in Egypt and of O/ME-SA/PanAsia-2QOM-15 in Iran
- O/EA-3/unnamed in Egypt and Lybia
- SAT 2/IV/Ken-09
- SAT 2/VII/Alx-12 and Ghb-12 sublineages



D. POOL 4 – Eastern Africa

Ethiopia [13]

No FMD outbreaks were reported in the country. In the meantime, the National Animal Health Diagnostic and Investigation Center (NAHDIC) is organizing validation workshops for different stakeholders within the country in view of the National FMD control strategy design, which is being carried out according to the Progressive Control Pathway.

Kenya [8]

FMDV serotypes SAT 1 and O were respectively detected in one and four of six bovine samples examined by the FMD National Reference Laboratory, Embakasi.

The laboratory has ongoing collaborations with Sandia National Laboratories, USA.

The last samples last forwarded by the country to the WRLFMD for genotyping was in 2013. Past genotypes detected in relation to the serotypes reported this month were O/EA-1/unnamed, O/EA-2/unnamed and O/EA-4/unnamed collected between 2009 and 2011.

Table 12: Summary of the history of FMD Pool 4, 2012 – 2017, for geographic distribution see Map13 below. (Source – Wahis, EuFMD Global Monthly Report)

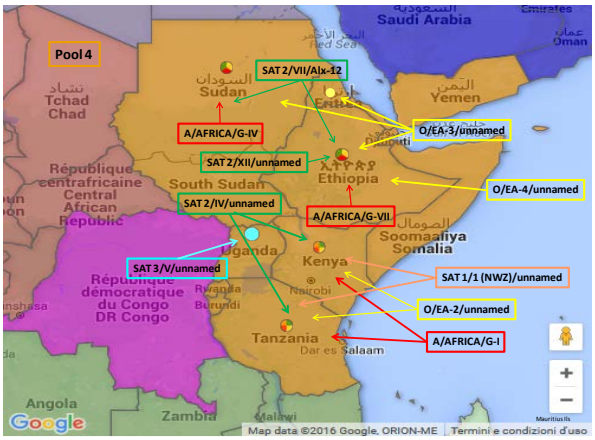
COUNTRY	FMD HISTORY FMDV serotypes, reported to OIE in 2012 – 2016 **(1st semester)	LAST OUTBREAK REPORTED/SEROTYPE #see pg. 1	Comment
Burundi	DISEASE PRESENT	Aug 2013 / not available	Typing required
Comoros	NO DATA AVAILABLE	2010	Follow –up needed
Democratic Republic of Congo	2012 – 2016**/A, O, SAT 1	May 2017/not typed	Follow –up needed
Djibouti	DISEASE ABSENT	Not available	Follow –up needed
Egypt	2012, 2014, 2016**/SAT 2 2012 – 2016**/O, A	May-Jun 2016/ O & Sat 2, March 2016/A, Aug 2016/typing pending	Follow –up needed
Eritrea	2014, 16/ DISEASE PRESENT 2015/ NO DATA REPORTED 2013/ DISEASE ABSENT, 2012/O	Nov 2016/not reported, Jan 2012/O	Follow –up needed
Ethiopia	O, 2015-16/SAT 1 2012 & 2105/SAT 2, 2012/A	Jun 2017/A, March 2017/O & SAT 1, May 2016/SAT 2	**See text**
Kenya	2012 – 2016 /NOT TYPED, A, O, SAT1, SAT2	Aug 2017/O & SAT 2, Jun 2017/SAT 1, Jan 2016/ A	**See text**
Libya	NO DATA REPORTED	Oct 2013/ O, Sat 2/Apr 2012	Follow-up needed
Rwanda	2015-16/NO DATA AVAILABLE 2012-2013/A, O, SAT1, SAT 2	Nov 2012/not typed	Typing required
Somalia	2012-13, 2015-16/DISEASE PRESENT, 2014/PENDING	June 2016/not reported	Follow –up needed
Sudan	2015-16 -16/A, SAT 1 & NOT SAMPLED, 2012-2014/O & NOT TYPED 2013/SAT 2,	Dec 2016/ not sampled, Oct 2016/O, Dec 2013/A, Jan 2014/SAT 2	Follow –up needed
South Sudan	2015/DISEASE PRESENT 2014/A, O SAT 1, SAT 2, SAT 3 2012-2013 & 2016 NO DATA REPORTED	2011	Follow –up needed
United Republic of Tanzania	2012-2016/A, O, SAT 1, SAT 2	Oct 2016/SAT 1, Aug 2016/O & SAT 2, Jun 2016/ A	Follow –up needed
Uganda	2016/NO DATA REPORTED 2013-16/NOT TYPED or NOT SAMPLED, 2012, 2015/ SAT 1,2012, 2014-15/O	May 2014/O Nov 2014/SAT1, Jan 2015/A and SAT 3, July 2015/ SAT 2 and untyped	Follow –up needed
Yemen	2015-16/NO DATA REPORTED 2013 – 2014/ DISEASE	2009/O	Follow –up needed

	PRESENT BUT WITHOUT QUANTITATIVE DATA, 2012/O		

Map 13: FMD distribution by serotype and topotype for East Africa. 2011 – 2016. (source – Google Fusion Maps, WRLFMD).

East Africa is known to be endemic for FMD, but available data is at present limited.
Conjectured circulating FMDV lineages in Pool 4 per 2015 2 [1, 11]:

- O (topotypes EA-2 (Kenya, Tanzania, DR Congo & Uganda), EA-3 (Egypt, Ethiopia, Eritrea, Kenya & Sudan) and EA-4 (Ethiopia, Kenya, Uganda).
- A/AFRICA (genotypes I (Kenya, Tanzania, D.R. Congo), IV (Sudan, Eritrea & Egypt) and VII (Ethiopia & Egypt))
- A/ASIA/Iran-05 BAR-08 sub-lineage (Egypt)
- SAT 1 (topotypes I (Kenya, Tanzania), IX (Ethiopia))
- SAT 2 (topotypes IV (Kenya, Tanzania), VII (Sudan, Egypt, Ethiopia), XII (Ethiopia, Sudan))
- SAT 3 (only detected in African buffalo in the south of the QENP, Uganda in 1970 & 1997 and recently in 2013)



E. POOL 5 – <u>West / Central Africa</u>

Cameroon [9]
The LANAVET), Garoua, Cameroon detected FMDV in 13 (20.97%) of the 62 bovine samples examined using RT- PCR. It also reported the serological testing of 74 bovine samples of which 22 (29.73%) resulted positive. The laboratory is also continuing its collaborative research project with the Ohio State University and Plum Island of the USA.
Most recent genotypes identified in the country are represented by A/AFRICA/G-IV and SAT 2/VII/Lib-12 in samples collected in 2013 for which VMSD tests are not available.

Ghana [14], **Nigeria** [15] **and Senegal** [16]
The ACCRA Veterinary Laboratory, Ghana, the National Veterinary Research Institute Vom, Nigeria and the Laboratoire National de l'Elevage et de Recherches Vétérinaires of Senegal reported that there were no diagnostic confirmations of FMD outbreaks in the respective countries, even if Nigeria is in the process of examining a batch of FMD suspect epithelial samples. This laboratory also provided advice to local farmers.

Table 13: Summary of the history of FMD Pool 5, 2012 – 2017, for geographic distribution see Map 14 below. (Source – Wahis, EuFMD Global Monthly Report)

Country	**FMD history FMDV serotypes, reported to OIE in 2012 – 2016 **(1st semester)**	**Last outbreak reported/serotype** #see pg. 1	**Comment** (Genotyping would be useful for this region)
Benin	2016/NO DATA REPORTED A, O, SAT 1, SAT 2/2012-2015	Jun 2014/O, A, SAT 1, SAT 2	Follow –up needed

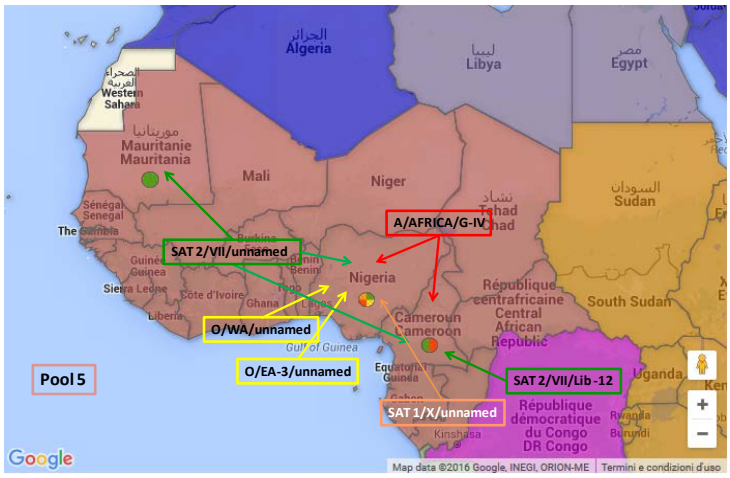
Burkina Faso	DISEASE PRESENT	Dec 2016/ not available	Follow –up needed
Cameroon	2016/NO DATA REPORTED DISEASE PRESENT	April 2017/untyped, Nov 2014/O, SAT 2, May 2014/SAT 1, Apr 2014/ A	**See text**
Cabo Verde	DISEASE ABSENT	Not available	Follow –up needed
Central African Republic	DISEASE PRESENT BUT WITHOUT QUANTITATIVE DATA	Not available	Follow –up needed
Chad	2016/DISEASE PRESENT 2014-15/ DISEASE ABSENT 2012 – 2013/ DISEASE PRESENT	Aug 2016/Not reported	Follow –up needed
Democratic Republic of the Congo	2012 – 2016/A, O, SAT 1	Dec 2016/A, O & Sat 1	Typing required
Congo	NO DATA AVAILABLE	Jun 2013/not typed	Typing required
Côte d'Ivoire	2013-16/ not sampled or not reported, 2012/A,	Jul 2016/not reported	Follow –up needed
Equatorial Guinea	2014 – 2016/ NO DATA AVAILABLE 2012 – 2013/DISEASE SUSPECTED	Not available	Follow –up needed
Gabon	2012, 2014-16/DISEASE ABSENT 2013/NO DATA AVAILABLE	Not available	Follow –up needed
Gambia	NO DATA AVAILABLE	2012/O	Follow –up needed
Ghana	2016/NO DATA AVAILABLE 2012 – 2015/DISEASE PRESENT	Dec 2016/ O & SAT 2 2014/not available	**See text**
Guinea-Bissau	2015-16**/DISEASE SUSPECTED 2014/ DISEASE PRESENT 2012-2013/DISEASE ABSENT	Oct 2016/O Dec 2016/SAT1 & SAT 2	Follow –up needed
Guinea	2012-2013, 2015-16**/ DISEASE ABSENT 2014/ DISEASE PRESENT	2014/not available	Follow –up needed
Liberia	NO DATA AVAILABLE	Not available	Follow –up needed
Mali	2013, 2016/DISEASE PRESENT 2015/A, SAT 1 2014-2015/SAT 2 2012/ NO DATA AVAILABLE	Oct 2016/not reported	Follow –up needed
Mauritania	2016/DISEASE SUSPECTED, 2014-2015**/SAT 2, 2012-2013/NO REPORTED OUTBREAKS	Dec 2014/SAT 2	Follow –up needed
Niger	2016**/DISEASE PRESENT BUT WITH NO QUALITATIVE DATA, 2015/O 2012 – 2014/NOT SAMPLED	2014/not sampled, May 2015/O	Follow –up needed
Nigeria	2015-16/DISEASE PRESENT 2012-2014/O	Feb 2017/not typed	**See text**

		Sept 2016/ O & SAT 1 Nov 2015/A, Sept 2014/ SAT 2	
Sao Tome Principe	2013-16/NO DATA AVAILABLE 2012/DISEASE ABSENT	Not available	Follow –up needed
Senegal	2015-16/DISEASE PRESENT 2012, 2014/NOT SAMPLED 2013/NO DATA AVAILABLE	Feb 2015/ A and O, 2014/ SAT 2	**See text**
Sierra Leone	DISEASE ABSENT**	Oct 1958	Follow –up needed
Togo	O, SAT 1	2012/O	Follow –up needed

Map 14: FMD distribution by serotype and topotypes for West Africa, 2012 – 2016 - white script in map refers to new introduction of viral lineage in pool or country of the pool during 2016. (source – Google Fusion Maps, WRLFMD).

Conjectured circulating FMDV lineages in Pool 5 per 2016 [1, 11]:

- Serotype O (topotypes WA, EA-3 (Nigeria))
- Serotype A (topotypes AFRICA IV & VI)
- Serotype SAT 1 - detection of a new viral lineage, SAT 1/X/unnamed in Nigeria
- Serotype SAT 2 (topotype VII/Lib-12 (Mauritania), and unnamed genotypes)



F. POOL 6 – Southern Africa

Namibia [2]

Another clinical FMD outbreak due to contact with wild animals was reported in cattle on July 27th 2017 at a village in Katima-Mulilo, Zambezi following the two episodes which occurred during the same month. Diagnosis by the Central Veterinary Laboratory is pending.

Summary of the animals present in the outbreak is reported in Table 14 and outbreak location in Map 15.

General control measures are movement control inside the country, vaccination in response to the outbreak, surveillance within containment and/or protection zone, traceability, quarantine, and disinfection while no treatment is being administered to the sick animals.

Table 14: summary of the animals involved in the FMD outbreak that occurred on July 27th 2017 at a village in Katima-Mulilo, Zambezi (source – WAHIS)

Species	Susceptible	Cases	Deaths	Killed and disposed of	Slaughtered	Apparent morbidity rate	Apparent mortality rate	Apparent case fatality rate	Proportion susceptible animals lost*
Cattle	500	15	0	0	0	3.00%	0.00%	0.00%	0.00%

*Removed from the susceptible population through death, destruction and/or slaughter

Map 15: location of the FMD outbreak that occurred on July 27th 2017 at a village in Katima-Mulilo, Zambezi, Namibia. (source – WAHIS)

South Africa [2, 17,]

Two independent FMD episodes respectively due to SAT 1 and SAT 2 were reported in the country.

The first episode caused by SAT 2 occurred between March and May 2017 and involved cattle of three different villages of Mpumalanga. Source of outbreaks is unknown and control measures adopted are movement control inside the country, screening, traceability and quarantine. Vaccination prohibited and affected animals are not receiving treatment.

Summary of the animals present in the outbreak is reported in Table 15 and outbreak location in Map 16

Map 16: approximate location of the FMD outbreaks that occurred between March at three different villages of Mpumalanga, South Africa. Coordinates were modified to protect privacy as required by South African legislation. (source – WAHIS)

Table15: summary of the animals involved in the FMD outbreaks due to FMDV serotype SAT 2 that occurred between March and May 2017 at Mpumalanga, South Africa. (source – WAHIS)

Species	Susceptible	Cases	Deaths	Killed and disposed of	Slaughtered	Apparent morbidity rate	Apparent mortality rate	Apparent case fatality rate	Proportion susceptible animals lost*
Cattle	108,679	21	0	0	0	0.02%	0.00%	0.00%	0.00%

*Removed from the susceptible population through death, destruction and/or slaughter

The second event due to FMDV serotype SAT 1, occurred again in cattle, on August 21st 2017 at Limpopo and was due to contact with wild animal species. As the outbreak is within South Africa's FMD protection zone, close to the Kruger National Park it does not affect South Africa's FMD free zone status. Location of the outbreak is not available while a summary of the animals present in the outbreak is presented in Table 16. Control measures adopted in this area are the same as those described for the previous episode.

Table 16: summary of the animals involved in the FMD outbreak due to FMDV serotype SAT 1 that occurred in cattle, on August 21st 2017. (source – WAHIS)

Species	Susceptible	Cases	Deaths	Killed and disposed of	Slaughtered	Apparent morbidity rate	Apparent mortality rate	Apparent case fatality rate	Proportion susceptible animals lost*
Cattle	1,010	3	0	0	0	0.30%	0.00%	0.00%	0.00%

*Removed from the susceptible population through death, destruction and/or slaughter

Of the six FMD suspect samples examined by PCR by the ARC- Onderstepoort Veterinary Institute one resulted positive and its typing is in process. No details are available on the origin of these samples.
The laboratory also examined 4,065 serum samples using liquid-phase blocking ELISA for the detection of FMDV serotypes SAT 1, SAT 2 and SAT 3 and 449 sera using FMD NSP ELISA. The ARC-Onderstepoort Veterinary Institute is continuing its collaboration on research projects with international organisations.

Zimbabwe [2]

Eleven FMD outbreaks, for which serotyping is still pending, occurred between July 21st and August 16th 2017 in Masvingo and Manicaland. Diagnosis was on serological basis and was confirmed by the Central Veterinary Laboratory on July 25th 2017, while the Botswana Vaccine Institute, OIE Reference Laboratory, is conducting viral confirmation.
Origin of outbreaks is reported as due to contact with infected animals at grazing/watering as also contact with wild species. In fact, although the outbreaks are occurring in FMD vaccination zones of the southeastern lowveld this lies close to a Gonarezhou National Park and wildlife conservancies. The events could be due to a low overall population immunity as routine vaccinations in these areas are now long overdue. Cattle and buffaloes are comingling due to the shortage of grazing pastures. Quarantine was imposed on all the infected districts with the institution of veterinary check-points to prevent cattle movement. Inspections and community education campaigns are currently being provided. Control measures in place are movement control inside the country, vaccination in response to the outbreaks, surveillance within/outside containment and/or protection zone, traceability, quarantine, control of wildlife reservoirs, zoning, while affected animals are not receiving treatment.
Summary of the animals present in the outbreaks is reported in Table 17 and outbreak location in Map 17.

Table 17: summary of the animals involved in the FMD outbreaks that occurred in cattle, occurred between July 21st and August 16th 2017 in Masvingo and Manicaland, Zimbabwe. (source – WAHIS)

Species	Susceptible	Cases	Deaths	Killed and disposed of	Slaughtered	Apparent morbidity rate	Apparent mortality rate	Apparent case fatality rate	Proportion susceptible animals lost*
Cattle	14,967	1094	49	0	0	7.31%	0.33%	4.48%	0.33%

*Removed from the susceptible population through death, destruction and/or slaughter

Map 17: location of the FMD outbreaks that occurred in cattle, occurred between July 21st and August 16th 2017 in Masvingo and Manicaland, Zimbabwe. (source – WAHIS)

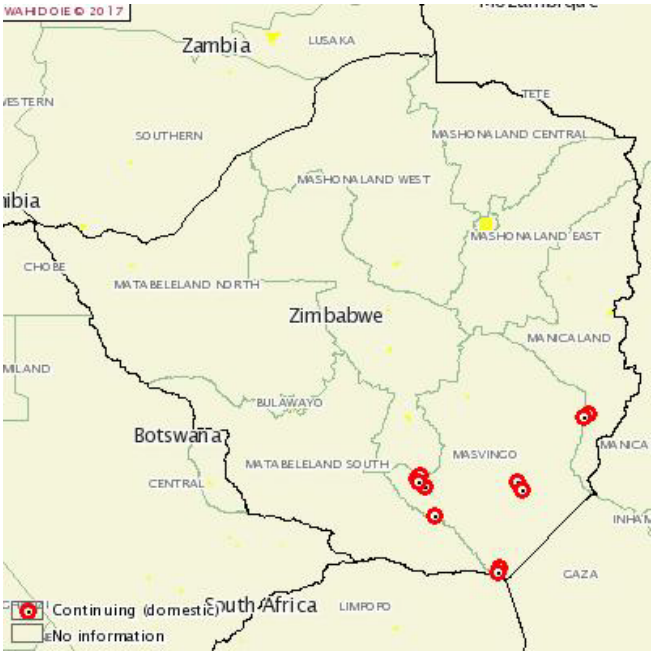


Table 18: Summary of the history of FMD Pool 6, 2012 – 2017, for geographic distribution see Map 18 below. (Source – Wahis, EuFMD Global Monthly Report)

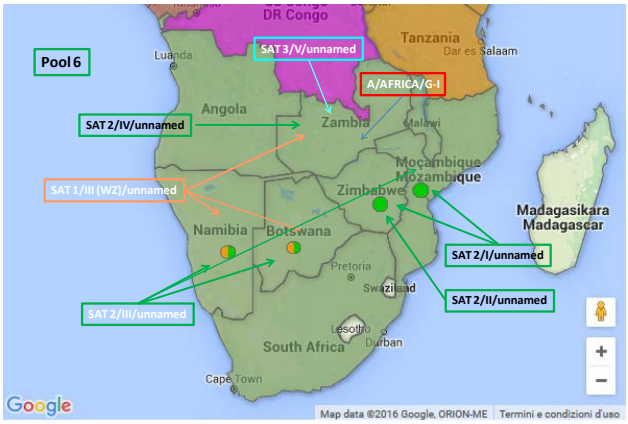
COUNTRY	FMD HISTORY FMDV serotypes, reported to OIE in 2012 – 2016 **(1st semester)	LAST OUTBREAK REPORTED/SEROTYPE #see pg. 1	Comment
Angola	2015-2016**/ DISEASE PRESENT 2013-2014/DISEASE ABSENT 2012/DISEASE SUSPECTED BUT NOT CONFIRMED	April 2016/SAT 2, July 2015/ SAT 2	Follow –up needed
Botswana	2012-2016**/SAT 2 2014-2015/SAT 1	Jun 2015/typing pending July 2015/SAT 2, June 2015/SAT 1	Follow –up needed
Democratic Republic of the Congo	2012 – 2016/A, O, SAT 1	Dec 2016/A, O & Sat 1	Typing required
Malawi	2012/NO OUTBREAKS REPORTED 2013-2015/ NO DATA AVAILABLE	Oct 2011, Sep 2015/serotyping pending	Follow –up needed
Mozambique	2016**/ NO DATA AVAILABLE 2012 -2015/DISEASE ABSENT	Dec 2016/SAT 2, Sep 2016/ Typing pending, May 2015/ SAT 1	Follow –up needed
Namibia	2014-2016**/SAT 22012-2014/SAT 1	Aug 2017/typing pending, May 2015/SAT 1, Jun 2015/SAT 2,	**See text**
South Africa	2015-16**/SAT 3 2012-2015/SAT 2	Aug 2017/SAT 1, May 2017/SAT 2 Dec 2015/SAT 3,	**See text**

	2013/SAT 1		
Zambia	2016/SAT 3 & NOT TYPEC 2013-2014/ NO DATA AVAILABLE 2012/SAT 1, SAT 2	Mar 2017/SAT 2, Jan 2013/SAT 1, Feb 2015/A, Mar 2016/SAT 3	Follow –up needed
Zimbabwe	2012-2016/SAT 2 2014-15SAT 1 2013/SAT 3	Aug 2017/typing pending, May 2017/SAT 2, Aug 2015/ SAT 1, Jun 2013/SAT 3	**See text**

Map 18: FMD distribution by serotype and topotype for Southern Africa, 2012 – 2016. (source – Google Fusion Maps, WRLFMD).

Swaziland and Lesotho are free from FMD without vaccination. There is a zone in both Botswana and Namibia, which has been FMD free without vaccination, since 2010 and 1997 respectively.
Conjectured circulating FMDV lineages in pool 6 per 2015 [1, 11]:

- Serotype SAT 1 (topotypes I, II and III) – new detection of SAT 1/III (WZ)/unnamed in Botswana during 2016
- Serotype SAT 2 (topotypes I, II, III and IV) - new detection of SAT 2/III/unnamed in Namibia
- Serotype SAT 3 (?) (topotypes I, II and III) – new detection of SAT 3/V/unnamed in Zambia during 2016



G. POOL 7 – South America

Columbia [2]

Following the outbreaks on July 14th and 28th 2017, another event occurred on July 19th at Cucuta, Norte De Santander. The third identified outbreak involving a cattle farm is located between the first outbreak notified on July 19th and the second one notified on July 28th. Diagnosis was confirmed on August 1st by the National veterinary diagnostic laboratory using real-time PCR.
All the animals were killed and disposed of and veterinary outbreak investigations were carried out in more than 176 farms in the zone, with a total population of 13,221 bovines, 1,759 swine, 24 buffalos 80 sheep and four goats. The animals are undergoing individual check-up for FMD signs. The quarantine measures kept in place are surveillance within and outside containment and/or protection zone, quarantine, disinfection and vaccination if available for the serotype responsible of the outbreak. Other measures to be adopted are movement control inside the country, traceability, official destruction of animal products and carcasses, by-products and waste, stamping out and zoning. Farms are under a sanitation process and once terminated, sentinel animals will be introduced. An epidemiological investigation is ongoing to determine the means of introduction of the virus.
A summary of the number of animals involved and location of the outbreak at Cucuta, Norte De Santander is reported in Table 19 and Map 19.

Table 19: animals involved in the FMD outbreak that occurred on July 19th 2017 reported at Cucuta, Norte De Santander. (source – WAHIS)

Species	Susceptible	Cases	Deaths	Killed and disposed of	Slaughtered	Apparent morbidity rate	Apparent mortality rate	Apparent case fatality rate	Proportion susceptible animals lost*
Cattle	330	10	0	330	0	3.03%	0.00%	0.00%	100.00%

*Removed from the susceptible population through death, destruction and/or slaughter

Map 19: location of the FMD outbreak that occurred on July 19th 2017 in cattle at Cucuta, Norte De Santander Columbia. (source - WAHIS)

Rest of Latin America [2, 10, 11]

The OIE FMD status of the countries in South America as reported in June 2017 is presented in Map 19.

Most South American countries are FMD free with vaccination (Uruguay) or without vaccination (Chile, Guyana) or with free zones with vaccination (Argentina, Bolivia, Brazil, Colombia, Peru and continental Ecuador) or without vaccination (Argentina, Bolivia, Brazil, Colombia, Peru) as described by the OIE maps (see: http://www.oie.int/en/animal-health-in-the-world/official-disease-status/fmd/en-fmd-carte/).

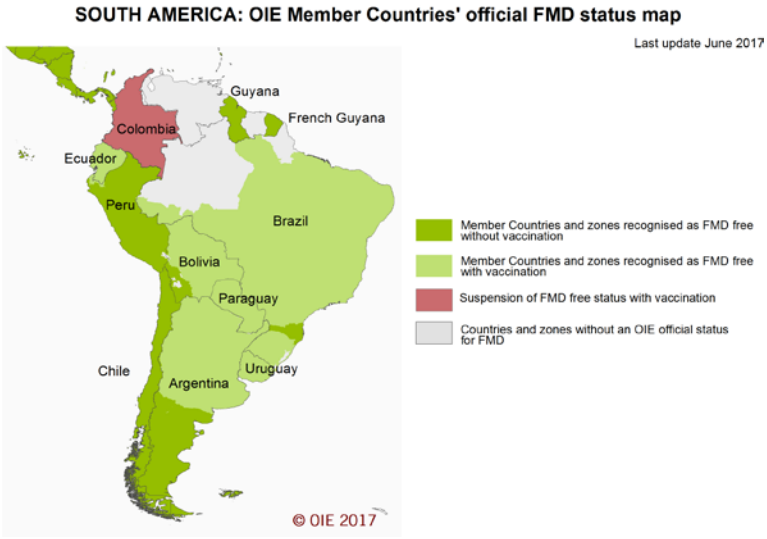
Small areas of the continent may still be considered as endemic but clinical cases are rare (Map20). In fact, before the outbreak reported in Columbia, during the OIE/FAO FMD Laboratory Meeting held in November 2016, PANAFTOSA reported data for historical FMD outbreaks that occurred in Venezuela in 2013. The FMD history relative to the Region for 2012 –2017 is reported in Table 20.

Table 20: Summary of the history of FMD Pool 16, 2012 – 2017, for geographic distribution see Map 20 below. (Source – WAHIS, EuFMD Global Monthly Report)

COUNTRY	FMD HISTORY FMDV serotypes, reported to OIE in 2012 2016**(1st semester)	LAST OUTBREAK REPORTED/SEROTYPE #see pg. 1	Comment
Columbia	DISEASE ABSENT	July 2017/O	**See text**
Paraguay	DISEASE ABSENT	Dec 2011/O	Follow –up needed

Venezuela (Bolivarian Republic of)	DISEASE ABSENT**	2011/O, 2013/ A	National situation needs verification

Map 20: FMD status for South America [2] (Source – OIE)



IV. OTHER NEWS:

POOL 2 – <u>South Asia</u>

Bangladesh [3] – During July 2017, FMD was reported as spreading fast in cattle causing even deaths in a high proportion of the affected animals.

[1]The 2nd WRLFMD Quarterly Report for the period April – June 2017 contains a list of recommended FMDV strains for antigen banks of FMD-Free countries. The discussion of this table is within the report. (Table 21)
The WRLFMD is at present working to adopt a risk-based approach for identifying circulating FMDV lineages and relate these to priority vaccines for use in Europe and other FMD-free settings.

RECOMMENDATIONS FROM WRLFMD® ON FMD VIRUS STRAINS TO BE INCLUDED IN FMDV ANTIGEN BANKS (FOR FMD-FREE COUNTRIES)

June 2017:

Note: Virus strains are NOT listed in order of importance

High Priority	A/ASIA/G-VII(G-18)* O Manisa O PanAsia-2 *(or equivalent)* Asia 1 Shamir A Iran-05 *(or A TUR 06)* A22 Iraq A24 Cruzeiro O BFS or Campos SAT 2 Saudi Arabia *(or equivalent i.e. SAT 2 Eritrea)*
Medium Priority	A Eritrea-98 SAT 2 Zimbabwe SAT 1 South Africa A Malaysia 97 (or Thai equivalent such as A/Sakolnakorn/97) A Argentina 2001 O Taiwan 97 *(pig-adapted strain or Philippine equivalent)*
Low Priority	A Iran '96 A Iran '99 A Iran 87 or A Saudi Arabia 23/86 *(or equivalent)* A15 Bangkok related strain A87 Argentina related strain C Noville SAT 2 Kenya SAT 1 Kenya SAT 3 Zimbabwe

Note: Discussions are currently underway to adopt a risk-based approach for different FMD viral lineages to identify priority vaccines for use in Europe and other FMD-free settings.

*Recent *in vitro* data from WRLFMD for serotype A viruses from Saudi Arabia and Iran highlights an apparent gap in vaccines supplied by international manufacturers for this viral lineage.

Table 21: Recommendations from WRLFMD® on FMD virus strains to be included in FMDV antigen banks (for FMD-free countries).
Note: Virus strains are NOT listed in order of importance

V. REFERENCES - Superscripts

1. World Reference Laboratory for Foot-and-Mouth Disease (WRLFMD), www.wrlfmd.org.
2. WAHID Interface – OIE World Animal Health Information Database http://web.oie.int/wahis/public.php?page=home
3. http://www.rsu-saarc.org/weekly-e-info
4. Project Directorate on Foot and Mouth Disease (PD-FMD), Indian Council of Agricultural Research, Mukteswar, India - *Dr. S. Saravanan*.
5. National Foot and Mouth Disease and TADS Laboratory, Nepal - *Dr. Sharmila Chapagain*
6. Central Veterinary Diagnostic and Research Laboratory *(CVDRL)*, of Kabul Afghanistan – Dr. Nazem Shirazi.
7. Progressive Control of Foot and Mouth Disease in Pakistan, - *Dr. Manzoor Hussain*, National Project Director and *Dr. Muhammad Afzal*, Project Coordinator.
8. National FMD Reference Laboratory, Embakasi, Kenya - *Dr. Abraham Sangula, Dr. Kenneth Ketter*.
9. Laboratoire National Vétérinaire (LANAVET) - Garoua, Cameroon - *Dr. Simon Dickmu Jumbo*.
10. 44a Reunión Ordinaria de la Comisión Sudamericana para la Lucha contra la Fiebre Aftosa - 6 – 8 March 2017, Rio de Janeiro, Brasil.
11. OIE/FAO FMD Reference Laboratory Network, Annual Report 2016
12. Regional Reference Laboratory for FMD (ARRIAH, Russia) - *Dr. S. Fomina.*
13. National animal health diagnostic and investigation center (NAHDIC), Ethiopia - *Dr. Daniel Gizaw.*
14. ACCRA Veterinary Laboratory, Ghana - *Dr. Joseph Adongo Awuni.*
15. FMD Research Centre, Virology Research Department, National Veterinary Research Institute, Vom, Plateau State, Nigeria - *Dr. Ularamu Hussaini.*
16. Laboratoire National de l'Elevage et de Recherches Vétérinaires (LNERV, Senegal) – *Miss Mariame Diop and Dr. Moustapha Lô.*
17. ARC -Onderstepoort Veterinary Institute, Republic of South Africa - *Ms E. Kirkbride, Dr F. Maree, Dr L. E. Heath*.