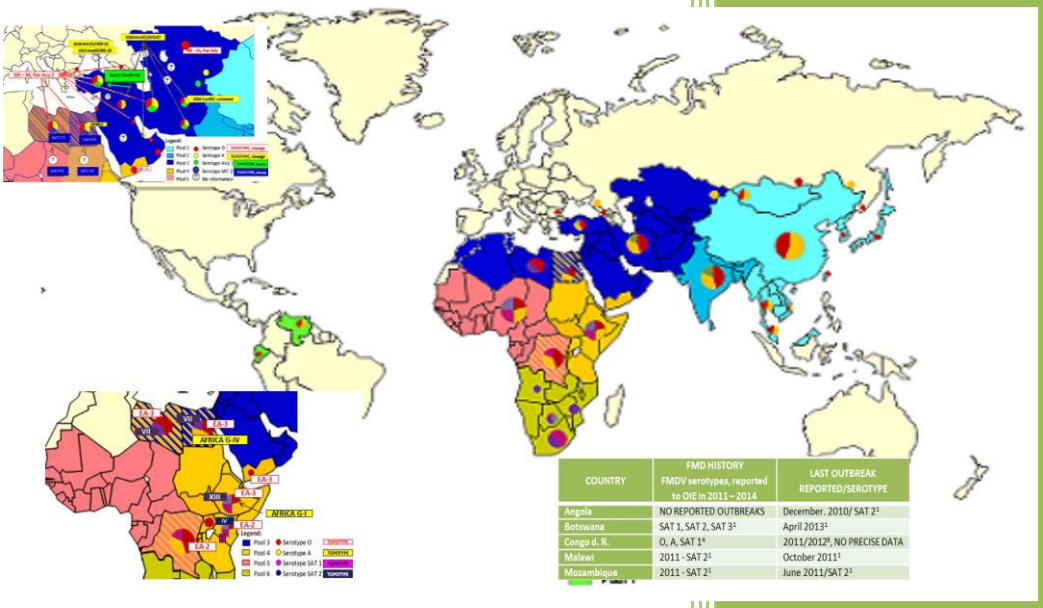
2015

Foot-and-Mouth Disease Situation
Monthly Report December 2015



COUNTRY	FMD HISTORY FMDV serotypes, reported to OIE in 2011 – 2014	LAST OUTBREAK REPORTED/SEROTYPE
Angola	NO REPORTED OUTBREAKS	December, 2010/ SAT 2[1]
Botswana	SAT 1, SAT 2, SAT 3[1]	April 2013[1]
Congo d. R.	O, A, SAT 1[1]	2011/2012[1], NO PRECISE DATA
Malawi	2011 - SAT 2[1]	October 2011[1]
Mozambique	2011 - SAT 2[1]	June 2011/SAT 2[1]

EuFMD

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

December 2015

Guest Editor
Dr. David Paton
(FAO World Reference Laboratory for FMD)

#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.

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Guest Editor's comments

We start 2016 with familiar concerns about FMD virus strains extending their range, and questions about what has triggered this and what may be the consequences. A common pool of serotypes O, A and Asia 1 virus strains are recognised in India and neighbouring countries linked by livestock trading, such as Bangladesh, Nepal and Bhutan [1]. If these FMD viruses gain access to Pakistan and Myanmar, the respective flows of ruminants from these countries towards the Middle East and South East Asia provide a conduit for further spread. Indian subcontinent viruses have also turned up further afield without any obvious intermediary spread [2]. In the past, there has often been a considerable lag between the emergence of new strains in the Indian subcontinent and their appearance in the Middle East, South East Asia and beyond [3]. In the case of westward spread, the militarised border between India and Pakistan may act as a significant barrier.

The O India 2001 strain of the Middle East South Asia topotype (O/ME-SA/Ind-2001; [4]) is the most prevalent FMD virus in India and despite being there for 15 years, it has only recently become widely recognised outside of the region. It was detected in the United Arab Emirates in 2009 and 2014 and in Saudi Arabia and Libya in 2013 and 2014. In 2014, it entered Tunisia and Algeria and in 2015, it arrived in Morocco and in Laos.
Serotype A in India has become dominated by a region specific strain, G-VII, of the Asia topotype that has been evolving there for many years [5]. A virus of this strain was detected in Myanmar in 2010. In 2015, this virus also appeared for the first time in the Middle East, being detected in Saudi Arabia and subsequently in Iran and Turkey.

Whether these viruses have been spread beyond the Indian subcontinent by animal movements, overseas workers or trade in meat or other commodities, they now threaten Europe and Central Asia. Considering their relatively distinct antigenic phenotypes, there is a danger that they may evade the protection offered by immunity whether derived from prior infection with other FMD viruses or due to prophylactic or emergency vaccination with non-Indian vaccine strains. Certainly this appears to be the case for the Indian A, where recent in-vitro matching-matching data from WRLFMD, indicates poor match with the vaccines that are widely used in the Middle East.

Suitable vaccines in India may not be readily available elsewhere pointing to a lack of coordination in managing international vaccine cover. Consequently, undue reliance for FMD control should not be placed on vaccination, and the maintenance of other preventive measures remains vital. Secondly, the suitability of the vaccine strains and vaccination regimens used as well as the strains held in vaccine banks must be kept under continuous review. Vaccine procurers should maintain dialogue with reference laboratories and vaccine manufacturers concerning the need and availability of new vaccine strains.

This month's report of SAT 3 in South African cattle is unusual, as cases of this serotype in livestock have been much less frequent than SAT 1 and SAT 2, which are generally considered more important components of the trivalent SAT vaccines used in Southern Africa.

References

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[2] Knowles NJ, Bachanek-Bankowska K, Wadsworth J, Mioulet V, Valdazo-González B, Eldaghayes IM, Dayhum AS, Kammon AM, Sharif MA, Waight S, Shamia AM, Tenzin S, Wernery U, Grazioli S, Brocchi E, Subramaniam S, Pattnaik B, King DP. (2014). Outbreaks of Foot-and-Mouth Disease in Libya and Saudi Arabia During 2013 Due to an Exotic O/ME-SA/Ind-2001 Lineage Virus. Transbound Emerg Dis. doi: 10.1111/tbed.12299.
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[4] Subramaniam S, Mohapatra JK, Sharma GK, Biswal JK, Ranjan R, Rout M, Das B, Dash BB, Sanyal A, Pattnaik B. (2015). Evolutionary dynamics of foot-and-mouth disease virus O/ME-SA/Ind2001 lineage. Vet Microbiol. 178(3-4):181-9.
[5] Subramaniam S, Pattnaik B, Sanyal A, Mohapatra JK, Pawar SS, Sharma GK, Das B, Dash BB. (2012). Status of foot-and-mouth disease in India. Transbound Emerg Dis. 60(3):197-203.

I. GENERAL OVERVIEW

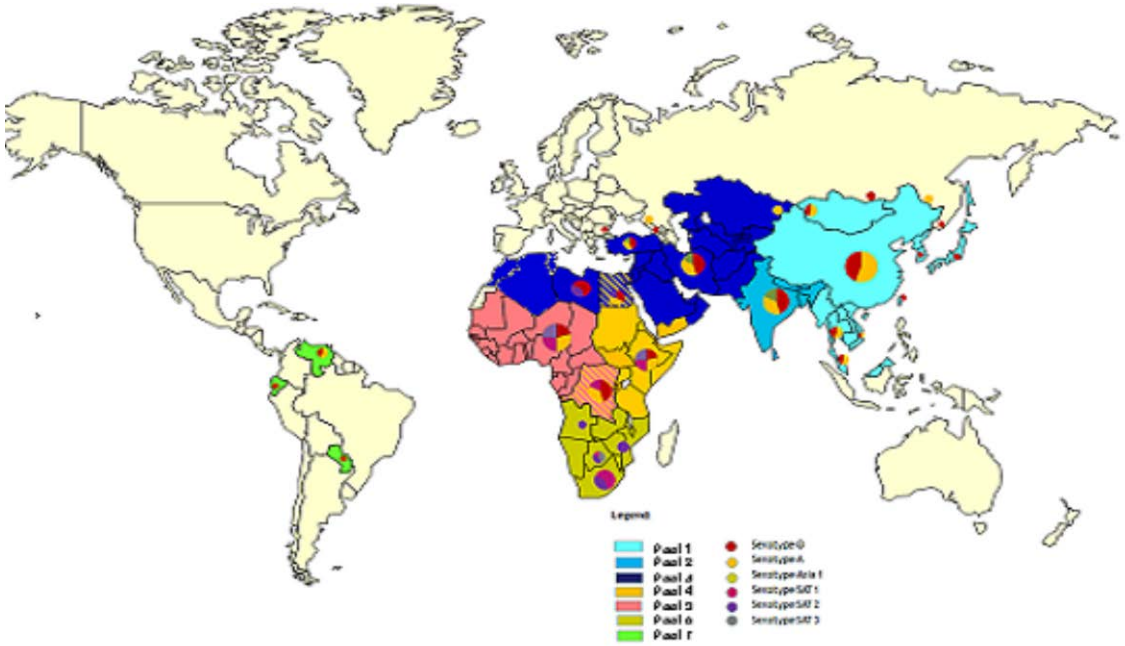
Pools represent independently circulating and evolving Foot-and-Mouth Disease virus (FMDV) *genotypes; within the pools, cycles of emergence and spread occur that usually affect multiple countries in the region. In the absence of specific reports, it should be assumed that the serotypes indicated below 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 – 2015

POOL	REGION/COUNTRIES – colour pools as in Map	SEROTYPES
1	**SOUTHEAST ASIA/CENTRAL ASIA/EAST ASIA** Cambodia, China (People's Rep. of), China (Hong Kong, SAR), China (Taiwan Province), Korea (DPR), Korea (Rep. of), Laos PDR, Malaysia, Mongolia, Myanmar, Russian Federation, Thailand, Viet Nam	**O, A and Asia 1**
2	**SOUTH ASIA** Bangladesh, Bhutan, India, Nepal, Sri Lanka	**O, A and Asia 1**
3	**WEST EURASIA & MIDDLE EAST** Afghanistan, Algeria, Armenia, Azerbaijan, Bahrain, Bulgaria, **Egypt**, Georgia, Iran, 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, **Congo D. R.**, Djibouti, **Egypt**, Eritrea, Ethiopia, Kenya, **Libya**, Rwanda, Somalia, Sudan, South Sudan, Tanzania, Uganda, Yemen	**O, A, SAT 1, SAT 2 and SAT 3**
5	**WEST/CENTRAL AFRICA** Benin, Burkina Faso, Cameroon, Cape Verde, Central Afr. Rep., Chad, **Congo D. R.**, Congo, Côte d'Ivoire, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea Biss., 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** Ecuador, Paraguay, Venezuela	**O and A**

Egypt, Libya and **Congo D. R.** (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

Foot-and-mouth disease (FMD) virus pools: world distribution by serotype in 2011-2015



II. HEADLINE NEWS

POOL 1- SOUTHEAST ASIA/CENTRAL ASIA/EAST ASIA

Cambodia [1] **–** FMDV was detected in porcine and bovine samples collected during September 2015 and respectively genotyped by the WRLFMD as A/ASIA/SEA-97 and O/ME-SA/PanAsia.
Details of the results of the cell culture/ELISA serotyping, genotyping of VP1 and vaccine matching strain differentiation (VMSD) tests carried out by the WRLFMD that are cited in this report will be described in the forthcoming 4th Quarterly WRLFMD Report (October - December, 2015).

China (Hong Kong, SAR) [1] **-** FMDV serotype O was detected by the WRLFMD in porcine tissue samples collected during November 2015 and for which genotyping is pending.

Laos PDR [1] **-** FMDV serotype O/ME-SA/Ind-2001d was detected by the WRLFMD in tissue samples collected during June 2015, for which species origin was not reported.

Myanmar [1] **–** FMDV serotypes O and A were detected by the WRLFMD in bovine tissue samples collected during October 2015 and genotyped as A/ASIA/SEA-97 and O/SEA/Mya-98.

Russian Federation [2] **-** The Russian Research Institute for Animal Health (FGBI-ARRIAH) reported the detection of FMDV serotype A/ASIA/G-VII and serotype O/ME-SA/PanAsia 2.

Vietnam [3] **–** The South-East Asia and China Foot and Mouth Disease (SEACFMD) Campaign reported that in November 2015, ten FMD outbreaks occurred in Vietnam involving different ungulate species. Only two of these outbreaks were serotyped, showing them to be caused by FMDV serotype O.

POOL 2 - SOUTH ASIA

India [4]- The Indian Council of Agricultural Research - Project Directorate on Foot and Mouth Disease (ICAR-PDFMD), Mukteswar, India detected FMDV serotype O among the 74 samples tested.

POOL 3 - WEST EURASIA & MIDDLE EAST

Iran [1, 5] - A FMD outbreak was caused by serotype A on the 8th of August 2015 in cattle in the village of Qom, Iran. Bovine samples collected during August and September 2015 were genotyped by the WRLFMD as A/ASIA/G-VII. VMSD tests carried out to compare the isolates with six vaccine strains, revealed no matches indicative of protection.

Israel [6] **–** Further to the first outbreak reported in Hazafon Israel, on a pig farm on the 11th of November, a second FMD outbreak occurred on the 13th of November 2015 on a beef cattle farm caused by the same serotype O.

Morocco [1] **–** VMSD tests were carried out by the WRLFMD on the isolates, identified as O/ME-SA/Ind-2001 responsible of the outbreaks of October 2015, in Central Morocco, obtaining results that are indicative of protection by three vaccine strains.

Palestine [7]**–** Sheep samples collected from a flock in the village Jamma'in, in the Nablus (Shechem) district were sent by the Palestinian Authority on the 12th of November 2015 to the FMD laboratory of the Kimron Veterinary Institute. The samples were found positive for FMDV serotype O.

Pakistan [8] **-** The Progressive Control of Foot and Mouth Disease Project reported 223 FMD outbreaks that occurred during November and December 2015, within which serotypes A, Asia 1 and O were detected.

Saudi Arabia [1] **–** None of the ten vaccine strains used in the VMSD tests carried out by the WRLFMD obtained results that were indicative of protection against the A/ASIA/G-II isolates responsible for the outbreaks of October 2015 in Riyadh.

POOL 4 - EASTERN AFRICA

Ethiopia [9] – The National Animal Health Diagnostic and Investigation Center (NAHDIC) detected FMDV SAT 2 in bovine samples collected during an outbreak.

Kenya [10] **-** The Foot-and-Mouth Disease Laboratory, Embakasi, Kenya detected FMDV serotype A among the seven bovine samples collected from different counties of the country.

POOL 5 - WEST/CENTRAL AFRICA

No FMD outbreaks were reported within this pool for December.

POOL 6 - SOUTHERN AFRICA

Republic of South Africa (RSA) [5] **–** A FMD outbreak caused by serotype SAT 3 was reported on the 8th of December 2015, in cattle of a village in Limpopo.

Zimbabwe [1] **–** The WRLFMD detected FMDV SAT 1/II (SEZ)/unnamed and SAT 2/II/unnamed among the nineteen bovine epithelium samples collected in Zimbabwe between April and August 2015.

POOL 7 - SOUTH AMERICA

Latin America [6] - It is a great achievement for South America as it is four years since the last report of a FMD outbreak in the region.

COUNTER

****** 48 MONTHS SINCE THE LAST OUTBREAK IN SOUTH AMERICA WAS REPORTED***

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

III. DETAILED POOL ANALYSIS

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

Cambodia [1]

The WRLFMD examined the cell culture isolated strains from two porcine and three bovine samples, all collected during September 2015, detecting FMDV in all except for one of the bovine samples. The viruses identified as A/ASIA/SEA-97 and O/ME-SA/PanAsia were respectively collected in cattle and pigs.

A summary of the sample and the genotyping details of the FMDV strains reported by the WRLFMD is presented in Table 2 and area location of sample collection in Map 2. Interesting to note is that the most closely related reference virus is a porcine isolate from Cumbria, United Kingdom even if the genetic distance between the two viruses is not high (Table 2).

Previous reports in the country for the genotypes detected were in 2009 for serotype A and 2013 for serotype O. During December the country reported 120 outbreaks as ongoing of which only six were sampled and identified as caused by FMDV serotype O.

Table 2: summary of the sample and the genotyping details of the FMDV strains collected in Cambodia in September 2015.

Strain Identifiaction	Sample species	Location of sample collection	Date of collection	Serotype/Topotype/Genotype	Most closey related field virus (seq id%)	Most closey related reference virus (seq id%)
CAM/2/2015	Cattle	Kampong Speu	14/09/2015	A/ASIA/Sea-97	A/CAM/2/2008 (HQ116294)(96.86)	A/TAI/7/2003 (HQ116312) (93.71)
CAM/5/2015			26/09/2015			
CAM/1/2015	Pig	Pursat	14/09/2015	O/ME-SA/PanAsia	O/CAM/1/2010 (95.77)	O/UKG/35/2001 (AJ539141) (90.92)
CAM/3/2015			15/09/2015			

Map 2: Location of areas in Cambodia from where samples reported in Table 0 were collected.

A/ASIA/Sea-97 O/ME-SA/PanAsia

China (Hong Kong, SAR) [1]

The WRLFMD reported the detection of FMDV serotype O in three of the four porcine tissue samples collected during November 2015 and for which genotyping is pending. These samples are further to the ones collected in September in which FMDV O/CATHAY/unnamed was detected.

Laos PDR[1]

FMDV serotype O/ME-SA/Ind-2001d was detected by the WRLFMD in three of the four tissue samples, for which species origin is not reported, collected in Vientiane Laos during June 2015. The strains had a 100% sequence identity (seq id) indicating a common epidemic origin. The most closely related field virus, not pertaining to the country, is O/IND189/2013 (KM264361) with a seq id of 98.59%, while the most closely related reference virus is O/BHU/3/2009 (KM921814) with a seq id of 95.46. The genetic relationship of these viruses reflects the transboundary movements of infected animals and/or commodities across wide areas of the region. As reported by the SEACFMD Campaign, there are no ongoing outbreaks during December in the country, while in 2015 the country registered 19 events.

Myanmar [1]

A/ASIA/SEA-97 and O/SEA/Mya-98 were detected by the WRLFMD in the five bovine tissue samples collected during October 2015. A summary of the sample and the genotyping details of the FMDV strains is presented in Table 3. Although the samples were collected from the same species, on the same day and within the same area of Mandalay State, a grade of genetic heterogeneity was noted for the two serotype O strains isolated.

During December, Myanmar did not report any FMD outbreaks, while 22 events were reported by SEACFMD to have occurred in 2015.

Table 3: summary of the sample and the genotyping details of the FMDV strains collected in Myanmar in September 2015.

<table>
<tr><th>Strain Identification</th><th>Serotype/Topotype/Genotype</th><th>Most closey related field virus (seq id%)</th><th>Most closey related reference virus (seq id%)</th></tr>
<tr><td>MYA/1/2015</td><td rowspan="2">O/SEA/MYA-98</td><td>O/MAY/11/2012 (95.31)</td><td rowspan="2">O/MYA/7/98 (DQ164925) (91.24 - 92.81)</td></tr>
<tr><td>MYA/5/2015</td><td>O/MYA/1/04 (TRRL) (93.43)</td></tr>
<tr><td>MYA/2/2015</td><td rowspan="3">A/ASIA/Sea-97</td><td>A/MYA/3/2015 (100)</td><td rowspan="3">A/TAI/7/2003 (HQ116312)(93.87)</td></tr>
<tr><td>MYA/3/2015</td><td rowspan="2">A/MYA/2/2015 (100)</td></tr>
<tr><td>MYA/4/2015</td></tr>
</table>

Russian Federation [2]

FGBI-ARRIAH reported the detection of FMDV serotype A, genetic lineage G-VII and O genetic lineage of PanAsia 2, respectively in one sample and three samples. The genetic lineage G-VII of FMDV serotype A was also responsible for the recent outbreaks reported in Iran (see below), Saudi Arabia and Turkey. The latter two were described in the October and November issues of this Report.

The laboratory examined 19,798 sera for post vaccination monitoring purposes. Other activities being conducted are studies on the immunobiological properties of the FMDV serotype A and O isolates and the provision of materials to the Federal Service for Veterinary and Phytosanitary Surveillance of the Ministry of Agriculture of the Russian Federation and advice to the Veterinary Services of the Russian Federation Subjects.

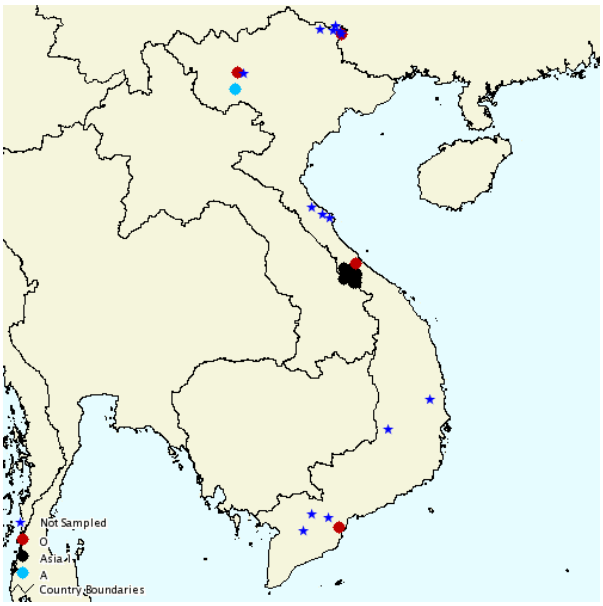
Vietnam [3]

Ten FMD outbreaks occurred in the country during November 2015, involving buffaloes, cattle and swine. Only two outbreaks were attributed to FMDV serotype O, as the remaining outbreaks were not sampled. The total number of new and ongoing FMD outbreaks per province is reported in Table 4 while their relative location is presented in Map 3.

Table 4: Number of FMD outbreaks per province reported in Vietnam as new/ongoing outbreaks during November 2015.

Province	Outbreaks reported in Nov. 2015	Total number of outbreaks (including previous ongoing episodes)
BEN TRE	0	1
CAN THO CITY	1	1
CAO BANG	6	6
DAK NONG	0	1
HA TINH	2	3
PHU YEN	0	1
QUANG TRI	1	1
SON LA	0	1
THAI BINH	0	15
TIEN GIANG	0	2
YEN BAI	0	2
Total	**10**	**34**

Map 3: Location of the new and ongoing FMD outbreaks that occurred in Vietnam during November 2015.



SEACFMD[3]

No outbreaks were reported during December 2015 in the countries belonging to the Organization. A summary of the FMD outbreaks that occurred in this area during 2015 are listed in Table 5 with their location presented in Map 4. Circulating FMDV serotypes within these countries are A, ASIA 1 and O, as also shown in Map 4.

Table 5: Distribution in the SEACFMD countries of the number of FMD outbreaks that occurred in 2015.

SEACFMD Countries	Total number of FMD outbreaks registered for 2015
Cambodia	128
Laos	19
Myanmar	22
Malaysia	52
Thailand	52
Viet Nam	80
Total	**353**

Map 4: Location of the FMD outbreaks that occurred or are ongoing during 2015 in the SEACFMD countries listed in Table 5.

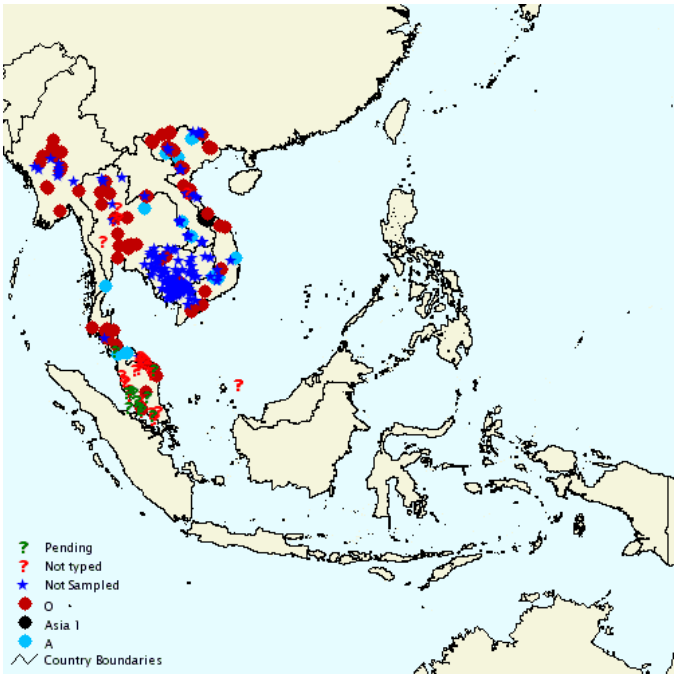


Table 6: Summary of the history of FMD Pool 1, 2012 – 2015, for geographic distribution see Map 5 below.

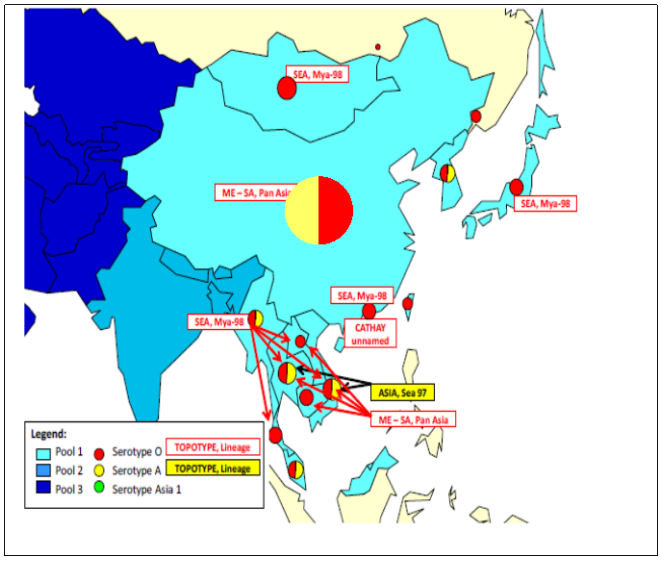
COUNTRY	FMD HISTORY FMDV serotypes, reported to OIE between 2012 – 2014	LAST OUTBREAK REPORTED/SEROTYPE # see pg. 1	Comment
Cambodia	O, 2013-2014/NOT SAMPLED	Sep 2015/O and A, Aug 2014/ not typed, June 2014/not typed	See text
China (People's Rep. of)	2012-2013/O, 2013/A,	Apr 2015/O, May 2015/A	Typing required
China (Hong Kong, Sar)	O	Nov 2015/O	See text
China (Taiwan Province)	2012-2013/O,	Jun 2015/A	Typing required
Korea (DPR)	2012-2013/DISEASE ABSENT	May 2014/not confirmed, July 2014/O	Follow-up needed
Korea (Rep. of)	2012-2013/DISEASE ABSENT	April 2015/O	Follow-up needed
Laos PDR	2012/DISEASE PRESENT WITH QUANTITATIVE DATA BUT WITH AN UNKNOWN NUMBER OF OUTBREAKS	Mar 2015/A, June 2015/O	See text
Malaysia	2012 –2013/O 2013/NOT TYPED	Sep2015/O	Typing required
Mongolia	2013/A	Sept 2013/A, May 2015/O, Oct 2015/O	Follow-up needed
Myanmar	2012-2013/O	Oct 2015/A and O, July 2014/ not typed	See text
Russian Federation	2012/O, 2013/A	Dec 2015/ A and O	See text
Thailand	O, A and NOT TYPED	Sep 2015 /A, Feb 2015/O,	

		Sept 2014/not typed	See text
Vietnam	O, NOT SAMPLED 2013- 2014/A,	Apr 2015/A, Sep 2015/ Asia 1 Nov 2015/O and not typed	See text

Map 5: FMD distribution by serotype and topotype in South East Asia, 2010 – 2014 (EuFMD).

Conjectured circulating FMD viral lineages in Pool 1 per 2014 [15]:

- Serotype O: O/SEA/Mya-98, O/ME-SA/PanAsia, O/CATHAY
- Serotype A: A/ASIA/Sea-97
- Prior to turning up in Vietnam at the end of 2015, Serotype Asia-1 had not been detected in the region since 2005 (Myanmar) and 2006 (P.R. China)



B. POOL 2 – South Asia

India [3]

FMD serotype O was detected among the 74 (50 cattle and 24 buffaloes) samples analysed by ICAR-PDFMD, Mukteswar, India using FMDV antigen and/or RNA detection tests.

FMDV serotype O strains isolated from five samples were genotyped and subjected to vaccine matching tests.

For epidemiological purposes, 18,612 sera were tested for FMDV antibodies. FMD diagnosis was carried out using indigenous diagnostic kits developed at PDFMD.

The laboratory was involved in the provision of expert advice to the Government, to the National and Local authorities and in research studies and collaborations with international organisations.

Table 7: Summary of the history of FMD Pool 2, 2012 – 2015, for geographic distribution see Map 6 below.

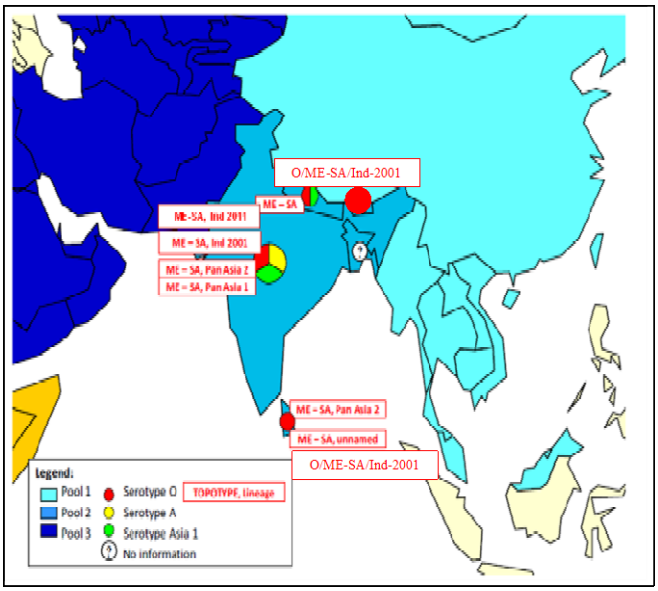
COUNTRY	FMD HISTORY FMDV serotypes, reported to OIE between 2012 – 2014	LAST OUTBREAK REPORTED/SEROTYPE # see pg. 1	Comment
Bangladesh	DISEASE PRESENT BUT WITHOUT QUANTITATIVE DATA	Not available	Follow –up needed
Bhutan	NOT TYPED, 2013/NOT SAMPLED 2013-2014/O	Not available	Follow –up needed
India	O, A, NOT SAMPLED 2012-2013/Asia 1 2013/NOT TYPED	Mar/Asia 1, Apr 2015/A, Dec 2015/O	See text
Nepal	O, 2012-2103/Asia 1	Apr 2014/O	Follow-up needed

Sri Lanka	2012 – 2013/O	Sept 2014/O	Follow-up needed

Map 6: FMD distribution by serotype and topotype in South Asia, 2011 – 2014 (EuFMD).

Conjectured circulating FMDV lineages in Pool 2 per 2014 [15]:

- O/ME-SA/Ind-2001 predominates (the O/ME-SA/Ind-2011 lineage that emerged during 2011 has not been recognized during 2012-13)
- O/ME-SA/PanAsia-2 (last detected in 2011 in Sri Lanka)
- A/ASIA/IND (genotype 18)
- Asia-1 (lineage C subdivided into Eastern and Western clusters)



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

Iran [1, 6]

A FMD outbreak was caused by serotype A on the 8th of August 2015 in fattening calves in the village of Qom, Iran. The Central Veterinary Laboratory of Iran confirmed the outbreak on the 2nd of December 2015. A summary of the animals involved in the outbreak and their location is respectively reported in Table 8 and Map 7. Control measures adopted were movement control inside the country, quarantine, disinfection and vaccination in response to the outbreak of 28,800 cattle of Qom using Merial/Razi polyvalent vaccine. Strains contained in the vaccine were not reported. No treatment was administered to the affected animals. The last reports of FMD were registered in the country in April 2014 that were caused by A/ASIA/Iran-05 and O/ME-SA/PanAsia or unnamed strains. One sample collected from the event was sent to the WRLFMD together with another collected in September 2015. According to the OIE report, these samples were collected from fattening calves, illegally introduced into a big fattening complex. The origin of the calves was traced to Miyandoab live animal market located in West Azerbaijan province. Fomites, vehicles and feed were also involved in the virus transmission.

The samples were genotyped by WRLFMD as A/ASIA/G-VII. The two viruses had a seq id of 99.06%. The most closely related field virus, not isolated in the country, was A/Van/TUR/203/2015 (FMDI) with a seq id between 98.75% and 99.37%. This result confirms the current presence of this strain in this country, further to similar reports of the last two months for Saudi Arabia and Turkey, as well as its circulation in Bangladesh in 2013 and in India since 2003. Six vaccine strains represented by A Iran 2005, A MAY 97, A SAU 95 (1), A SAU 95(2), A Tur 20/6 and A22IRQ were evaluated with the above isolates in the VMSD test obtaining r_1 values ranging from 0.00 to 0.26, that were indicative of poor match and little or no protection by the vaccines.

Table 8: summary of the number of cattle involved in the FMD outbreak of the 8th of August 2015 in Qom Iran.

Species	Susceptible	Cases	Deaths	Destroyed	Slaughtered	Apparent morbidity rate	Apparent mortality rate	Apparent case fatality rate	Proportion susceptible animals lost*
Cattle	1,250	15	2	0	0	1.20%	0.16%	13.33%	0.16%

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

Map 7: Location of the FMD outbreak that occurred on the 8th of August 2015 in Qom Iran.

Israel [5]

A second FMD outbreak in Hazafon Israel occurred on the 13th of November 2015 on a beef cattle farm five kilometres away from the first outbreak that was reported on a pig farm, on the 11th of the same month. On the 30th of November, the Virology Division of the Kimron Veterinary Institute, FMD National laboratory, confirmed the diagnosis as FMDV serotype O, as for the previous swine outbreak. A summary of the animals involved in the outbreak and their location is respectively reported in Table 9 and Map 8.

Control measures in place are disinfection, quarantine, movement control inside the country, surveillance outside and within containment and/or protection zone, official disposal of carcasses, by-products and waste and zoning.

Vaccination is carried out in response to the outbreaks and 2,200 pigs in Hazafon were administered a trivalent vaccine containing FMDV A, Asia 1 and O strains. No treatment is being given to affected animals.

Map 8: Location of the FMD outbreak that occurred on the 13th of November 2015 in Hazafon Israel.

Table 9: summary of the number of cattle involved in the FMD outbreak on the 13th of November 2015 in Hazafon Israel.

Species	Susceptible	Cases	Deaths	Destroyed	Slaughtered	Apparent morbidity rate	Apparent mortality rate	Apparent case fatality rate	Proportion susceptible animals lost*
Cattle	65	2	0	0	0	3.08%	0.00%	0.00%	0.00%

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

Morocco [1, 5]

The VMSD tests carried out on the O/ME-SA/ Ind-2001d isolates responsible for the outbreaks of October 2015, in Central Morocco with three vaccine strains represented by O 3039, O Manisia and O/TUR/5/2009, obtained results that are indicative of protection.

The outbreaks that occurred between October/November 2015 were reported as resolved while the control measures that are still applied are disinfection, quarantine, screening of animals, surveillance within and outside containment and/or protection zone movement control inside the country, stamping out, official destruction of animal products, carcasses, by-products and waste. No treatment is being administered to affected animals while vaccination has been administered to 38,917 cattle in response to the outbreaks using a vaccine prepared from strains FMDV O Manisa and O 3039.

Palestine [7]

A press release by the Director of the Field Veterinary Services & Animal Health of the Ministry of Agriculture reported that sheep samples collected from a flock in the village Jamma'in, in the Nablus (Shechem) district, sent by the Palestinian Authority on the 12th of November 2015 to the FMD laboratory of the Kimron Veterinary Institute, were found positive for FMDV serotype O, as were the outbreaks reported in Hazafon, Israel.

Genotyping of the viruses isolated from the different episodes would be useful to follow the epidemic origin of the outbreaks.

FMD was suspected due to the sudden death with no premonitory clinical signs of about 70 lambs, 7-10 days old, approximately 50 percent of the age category present in the flock. The lesions observed during the autopsy, carried out in several dead lambs, included increased thoracic fluid, lung oedema, myocarditis, myocardial haemorrhages, and myocardial focal necrosis ("tiger heart"), frequently observed in young animals dying from FMD.

Pakistan [8]

The Progressive Control of Foot and Mouth Disease Project reported 87 and 136 FMDV outbreaks in November and December 2015, respectively. Summaries of the outbreaks and of the vaccination activities carried out in December 2015 are reported in Table 10 and 11.

Table 10: FMD outbreaks that occurred in November and December 2015 in various parts of Pakistan.

Province	Number Outbreaks	Number of Outbreaks due to FMD Virus Serotype(s) for				ELISA Negative	Number Outbreaks	Number of Outbreaks due to FMD Virus Serotype(s) for				ELISA Negative	Not yet typed
		O	A	Asia-1	Mixed			O	A	Asia-1	Mixed		
Sindh	13	5	-	3	1	4	49	9	6	8	22	5	-
Azad Kashmir	7	-	4	-	-	3	3	2	-	-	-	1	-
Khyber Pakhtunkhwa	4		1	3	-	-	1			1		1	-
Punjab	58	20	12	10	0	16	77	26	14	5	0	25	6
Islamabad Capital Territory	5	-	-	5	-	-	5	-	-	5	-	-	-
Total	**87**	**25**	**17**	**21**	**1**	**23**	**136**	**37**	**20**	**19**	**22**	**32**	**6**

Table 11: vaccination activity carried out during December in various parts of Pakistan.

Province	Ring Vaccination	Cost sharing basis
Sindh	275	25,780
Balochistan	-	1,000
Khyber Pakhtunkhwa	100	-
Punjab	2,200	6,050
Azad Kashmir	100	-
Islamabad Capital Territory	200	250
Total	**2,875**	**33,080**

Saudi Arabia [1]

The r_1 values, ranging from 0.00 to 0.23, obtained for the ten vaccine strains that were evaluated in the VSMD test with the isolates responsible of the outbreaks of October 2015 in Riyadh, were not indicative of protection. The vaccine strains used in the test were represented by A Iran 2005, A IRN 87, A IRN 96, A IRN 99, A MAY 97, A SAU 95, A SAU 95 (1), A SAU 95(2), A Tur 20/6 and A22 IRQ with A MAY 97.

Turkey [5]

While no FMD outbreaks were reported for December 2015, the following control measures are still in force: disinfection, quarantine, surveillance within containment and/or protection zone, movement control inside the country and vaccination of 789 and 460 cattle, respectively in Amasya and Bitlis. Details of the vaccine administered are unavailable.

Table 12: Summary of the history of FMD Pool 3, 2012 – 2015, for geographic distribution see Map 9 below.

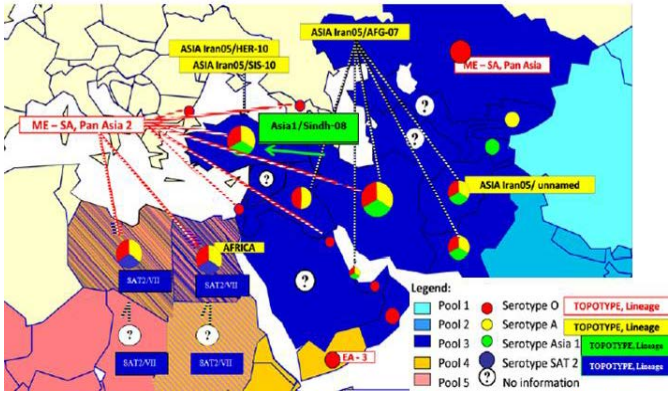
COUNTRY	FMD HISTORY FMDV serotypes, reported to OIE in 2012 – 2014	LAST OUTBREAK REPORTED/SEROTYPE # see pg. 1	Comment
Afghanistan	2013/O, A, Asia 1, NOT TYPED 2012/SEROTYPE NOT REPORTED	2014/A, Asia 1, O	Follow –up needed
Algeria	2014/O	Apr 2015/O	Follow –up needed
Armenia	2012-2013/DISEASE ABSENT	2006/A	Follow –up needed
Azerbaijan	DISEASE ABSENT	2007/0	Follow –up needed
Bahrain	2012 /O	Oct 2014/O	Follow –up needed
Egypt	2012, 2014/SAT 2 2012 - 2014/O, A	April 2014/Sat 2, Jan-April 2015/A & O	Follow –up needed
Georgia	DISEASE ABSENT	2001/ASIA 1	Follow –up needed
Iran	O, A, 2012-2013/Asia 1	Jun 2013/Asia 1, Apr 2014/O, A	Follow –up needed
Iraq	2012-2013/O, A	Dec 2013/A, O	Follow –up needed
Israel	2012-2013/O	Feb 2014/O, Nov 2015/not typed	Follow –up needed
Jordan	DISEASE ABSENT	2006/A	Follow –up needed
Kazakhstan	2012/O 2012 –2013/A	Aug 2012/O, Jun 2013/ A	
Kuwait	2012/O 2013 – 2014/ DISEASE ABSENT	Jan 2012/O	Follow –up needed
Kyrgyzstan	2012-2013/O, A	Apr 2013 /O, A, Aug	Typing required

		2014/not typed	
Lebanon	DISEASE ABSENT	2010/not typed	Follow –up needed
Libya	NO DATA AVAILABLE	Oct 2013/O	Follow –up needed
Morocco	No outbreaks reported for that period	Oct 2015/O	See text (last reported outbreak in 1999 due to FMDV O)
Oman	2012-2013/O	May 2015/SAT 2	Follow –up needed
Pakistan	DISEASE LIMITED TO ONE OR MORE ZONES	Oct 2015/A, Asia 1 and O	See text
Palestine	O, 2012-2013 - SAT 2	Mar 2013/Sat 2, Nov 2014/O	Follow –up needed
Qatar	2012-2013/O	Dec 2013/O	Follow –up needed
Saudi Arabia	2013/O	Mar 2014/O, Oct 2015/A	See text
Syrian Arab Republic	DISEASE ABSENT	2002/ A & O	Follow –up needed
Tajikistan	2012/NOT TYPED 2013/DISEASE ABSENT	Nov 2011/Asia 1, Nov 2012/ NOT TYPED	Follow –up needed
Tunisia	2014/O	Oct 2014/O	Follow –up needed
Turkey	Asia 1, A, O, NOT TYPED	May 2014- 2015/ Asia 1 and O, Oct 2015/ A	Follow –up needed
Turkmenistan	NO DATA AVAILABLE	Not available	Follow –up needed
United Arab Emirates	2012/DISEASE ABSENT 2013-2014/O	Jan 2014/O	Follow –up needed
Uzbekistan	NO DATA AVAILABLE	Not available	Follow –up needed

Map 9: FMD distribution by serotype and topotype for West Eurasia and Middle East, 2012 – 2014 (EuFMD).

Conjectured circulating FMDV lineages in Pool 3 per 2014 [15]:

- O/ME-SA/PanAsia-2 (predominantly from ANT-10 and FAR-09 sub-lineages)
- O/ME-SA/Ind-2001 (recent incursion per 2013/14 from the Indian sub-continent)
- A/ASIA/Iran-05 (from SIS-12, SIS-10, FAR-11 and BAR-08 sub-lineages)
- Asia-1 (Sindh-08 lineage).
- A/Asia/G-VII (recent incursion from South Asia)[1]



D. POOL 4 – Eastern Africa

Ethiopia [9]

During a FMD outbreak in cattle, personnel from the NAHDIC collected 13 tissue and swab samples and 21 sera and provided expert advice relative to the outbreak investigation. FMDV serotype SAT 2 was responsible of the event as it was detected in eight of the tissue and swab samples using antigen detection ELISA while, antibodies against FMDV non-structural protein (NSP) were detected in thirteen of the sera samples using the 3ABC ELISA.
In a serosurvey, 28 out of 1304 (2.15%) samples collected from small ruminants were found positive for FMDV antibodies using 3ABC NSP ELISA.

NAHDIC has also participated to the proficiency test, funded by the EuFMD and organized by the WRLFMD.
A FMD meeting on OIE twinning will be held between 12thto 14th January 2016 and, during this period, 5 experts from the WRLFMD will be visiting NAHDIC.

Kenya [10]

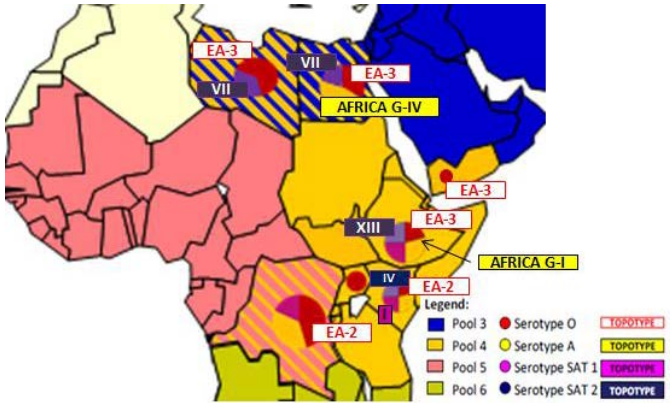
The FMD Laboratory, Embakasi, Kenya detected FMDV serotype A using FMD Ag detection ELISA and/or RT-PCR in four of the seven bovine samples collected from different counties of Kenya. The laboratory also carried out post-vaccination monitoring activities in herds of different countries vaccinated with those produced by the Kenya Veterinary Vaccines production Institute (KEVEVAPI).

Table 13: Summary of the history of FMD Pool 4, 2012 – 2015, for geographic distribution see Map 10 below.

COUNTRY	FMD HISTORY FMDV serotypes, reported to OIE in 2012 - 2014	LAST OUTBREAK REPORTED/SEROTYPE #see pg. 1	Comment
Burundi	NO DATA AVAILABLE	Aug 2013 / not available	Typing required
Comoros	NO DATA AVAILABLE	2010	Follow –up needed
Congo d. R.	NO DATA AVAILABLE	Jun 2013/not typed	Typing required
Djibouti	DISEASE ABSENT	Not available	Follow –up needed
Egypt	2012, 2014/SAT 2 2012 - 2014/O, A	April 2014/Sat 2, May 2014/A, Oct 2014/O	Follow –up needed
Eritrea	2012/O	Jan 2012/O	Follow –up needed
Ethiopia	O, 2012/A, SAT 2	Dec 2015/SAT 2, Aug 2015/O, Jun 2014/A and SAT 1, Jan 2015/confirmation pending,	See text
Kenya	O, SAT1, SAT2, 2012 – 2013/A, 2012/NOT TYPED	Dec 2015/ A, Oct 2015/SAT1 and SAT 2, Apr 2015/O	See text
Libya	NO DATA AVAILABLE	Oct 2013/ O, Sat 2/Apr 2012	Follow-up needed
Rwanda	2012-2013/A, O, SAT1, SAT 2	Nov 2012/not typed	Typing required
Somalia	2012/NOT SAMPLED 2013 – 2014/ NO DATA AVAILABLE	2011	Follow –up needed
Sudan	O, 2013/SAT 2, 2013-2014/NOT TYPED	2013/O, SAT2	Follow –up needed
South Sudan	NO DATA AVAILABLE	2011	Follow –up needed
Tanzania	2012/O 2012-2013/A, SAT 1, SAT 2	May 2015/O Apr2013/ A, SAT 1, SAT2	Follow –up needed
Uganda	2012/O, SAT 1 2012-2013/NOT TYPED	May 2014/O Nov 2014/SAT1, Jan 2015/A, and SAT 3, July 2015/ SAT 2 and untyped	See text
Yemen	2012/O, 2013 – 2014/ DISEASE PRESENT BUT WITHOUT QUANTITATIVE DATA	2009/O	Follow –up needed

Map 10: FMD distribution by serotype and topotype for East Africa. 2011 – 2014 (EUFMD)

East Africa is known to be endemic for FMD, but currently available data are limited.



Conjectured circulating FMDV lineages in Pool 4 per 2014 [15]:

- O (topotypes EA-2 (Kenya, Tanzania, DR Congo, Uganda), EA-3 (Ethiopia, Eritrea, Sudan, Egypt) and EA-4 (Ethiopia, Kenya, Uganda).
- O/ME-SA/Ind2001 (in Libya, Tunisia and Algeria)
- 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) and IX (Ethiopia))
- SAT 2 (topotypes IV (Kenya, Tanzania), VII (Sudan, Egypt), XIII (Ethiopia, Sudan))
- SAT 3 (only detected in African buffalo in the south of the QENP, Uganda in 1970 & 1997 and recently in 2014)

E. POOL 5 – West / Central Africa

Cameroon [11]

Of the 82 cattle serum samples tested, the Laboratoire National Vétérinaire detected 22 as positive for FMD antibodies using NSP ELISA.

The laboratory personnel were also involved in the investigations of outbreaks and collaborative partnerships with the Ohio State University and Plum Island Laboratory, USA are proceeding.

Ghana [12] and Senegal [13]

The Accra Veterinary Laboratory, Ghana and Laboratoire National de l'Elevage et de Recherches Vétérinaires (ISRA-LNERV), Dakar, Senegal reported that no FMD activities were conducted during December 2015.

Table 14: Summary of the history of FMD Pool 5, 2012 – 2015, for geographic distribution see Map 11 below.

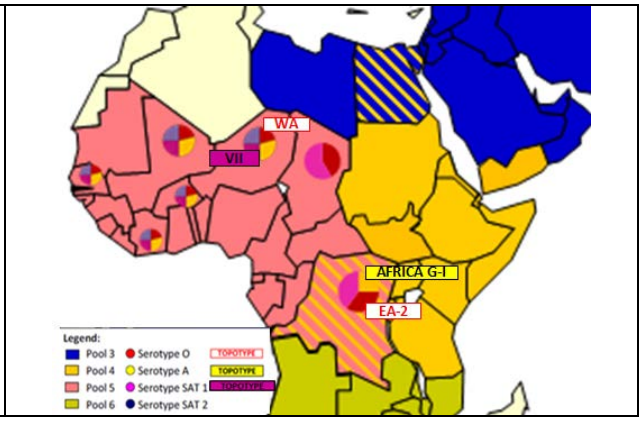
Country	FMD history FMDV serotypes, reported to OIE in 2012 – 2014	Last outbreak reported/serotype #see pg. 1	Comment (Genotyping would be useful for this region)
Benin	A, O, SAT 1, SAT 2	Jun 2014/O, A, SAT 1, SAT 2	Follow –up needed
Burkina Faso	SEROTYPES NOT REPORTED	2013/ not available	Follow –up needed
Cameroon	SEROTYPES NOT REPORTED	Apr 2014/ A, Nov 2014/O, SAT 2, May 2014/SAT 1, Jun 2014, Jan 2015 and July-Aug 2015/untyped	See text Serotyping and genotyping required
Cape Verde	NO DATA AVAILABLE	Not available	Follow –up needed
Central Afr. Rep.	DISEASE PRESENT BUT WITHOUT QUANTITATIVE DATA	Not available	

Chad	2012 – 2013/SEROTYPES NOT REPORTED	Not available	
Congo D. R.	2012 – 2013/A, O, SAT 1	Jun 2013/not typed	Typing required
Congo R.	NO DATA AVAILABLE	Jun 2013/not typed	Typing required
Cote D'Ívoire	2012/A, NOT SAMPLED 2013/ SEROTYPES NOT REPORTED	Jun 2013/not typed	Follow –up needed
Equatorial Guinea	DISEASE SUSPECTED BUT NOT CONFIRMED	Not available	Follow –up needed
Gabon	NO DATA AVAILABLE	Not available	
Gambia	NO DATA AVAILABLE	2012/O	
Ghana	2012 – 2014/SEROTYPES NOT REPORTED	2014/not available	See text Follow –up needed
Guinea Biss.	DISEASE ABSENT	No data available	Follow –up needed
Guinea	2012-2013/ DISEASE ABSENT	2014/not available	
Liberia	NO DATA AVAILABLE	Not available	Follow –up needed
Mali	2012/DISEASE ABSENT 2013/ SEROTYPES NOT REPORTED	2011/2012, no precise data	
Mauritania	2012-2013/NO REPORTED OUTBREAKS	Dec 2014/SAT 2	Follow –up needed
Niger	2012 – 2014/NOT SAMPLED	2014/not sampled, May 2015/O	See text
Nigeria	2012 – 2014/NOT SAMPLED	Nov 2015/A and SAT 1, Sept 2014/0 and SAT 2	See text Genotyping required Follow –up needed
Sao Tome Principe	2012/DISEASE ABSENT, 2013/NO DATA AVAILABLE	Not available	Follow –up needed
Senegal	2012, 2014/NO DATA AVAILABLE 2013/DISEASE ABSENT,	2014/ SAT 1 Feb 2015/ A and O	See text Follow –up needed
Sierra Leone	DISEASE ABSENT	Oct 1958	Follow –up needed
Togo	O, SAT 1, 2013/NOT TYPED	2012/O	Follow –up needed

Map 11: FMD distribution by serotype and topotypes for West Africa, 2011 – 2014 (EuFMD)

Conjectured circulating FMDV lineages in Pool 5 per 2014 [15]:

- Serotype O (topotypes WA, EA-3 (Nigeria))
- Serotype A (topotype AFRICA, genotypes IV and VI)
- Serotype SAT 1 (?)
- Serotype SAT 2 (topotype VII)



F. POOL 6 – SOUTHERN AFRICA

Botswana [5]

Subsequent to the outbreaks that started on the 26th of July in Zone 2e and on the 3rd of August 2015 in Zone 2D of Ngamiland, both caused by FMDV SAT 2, control measures are still in place even if the last outbreaks took place respectively on the 20th of August and 4th of September. These measures are disinfection, movement control inside the country, traceability, surveillance within and outside containment and/or protection zone and control of wildlife reservoirs for the outbreak that occurred in Zone 2D.

In response to outbreaks, a ring vaccination was carried out using a trivalent vaccine containing serotypes SAT 1, SAT2 and SAT 3 administered respectively to 6,479 cattle in Zone 2D and to 17,505 cattle in Zone 2e.

There were no suspects of FMD during the clinical surveillance carried out in the two areas, while epidemiological investigations are continuing.

Mozambique [5]

No further outbreaks were reported in the provinces of Gaza and Maputo following those of May and July 2015, both due to FMDV SAT 2. The number of outbreaks registered between May and the last were 426 (152 in Massingir district of Gaza Province and 274 in Magude district of Maputo province). A drought, currently present in the region, is favouring the concentration of a high number of animals in a few water bodies with an increase of movement of susceptible animals and interactions with wildlife species. In this area, a ring vaccination including 30,139 cattle in Gaza and to 50,619 cattle in Maputo was carried out using a vaccine containing FMDV serotypes SAT 1 and 2.

Republic of South Africa (RSA) [5, 13]

The FMD outbreak caused by serotype SAT 3 that occurred on the 8th of December 2015, in cattle of a village of Limpopo, RSA is close to the borders with Mozambique and Zimbabwe. The episode was confirmed on the 10th of December 2015 by the Agricultural Research Council – Onderstepoort Veterinary Institute (ARC – OVI) (OIE Reference Laboratory) using PCR and liquid-phase blocking ELISA. Cattle with FMD suspect signs were detected in one diptank area in the FMD protection zone for this the present outbreak has no effect on South Africa's FMD free status. The source of outbreak has been attributed to contact with wild animals. Control measures applied are quarantine and movement control inside the country with no treatment of affected animals. Other measures to be applied are vaccination in response to the outbreak and surveillance within containment and/or protection zone. Summary of the animals involved and location of outbreak are respectively reported in Table 15 and Map 12.

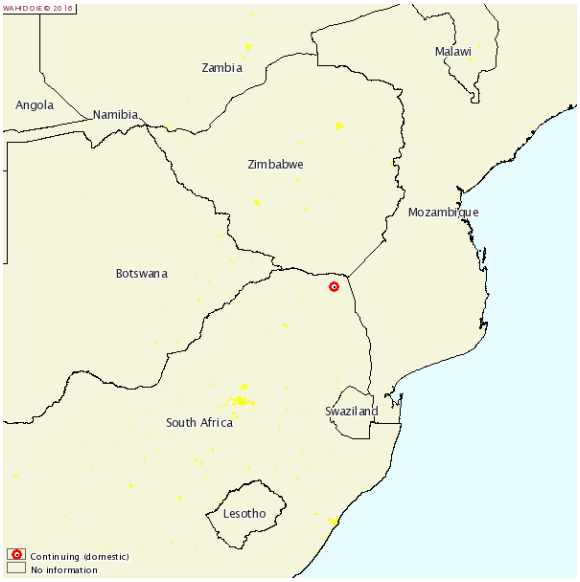
The ARC – OVI conducted 2,121 tests in liquid-phase blocking ELISA for the detection of antibodies against serotypes SAT 1, SAT 2 and SAT 3, as well as 303 tests using NSP ELISA. The laboratory also has ongoing research studies and collaborations with international organisations.

Table 15: summary of the number of cattle involved in the FMD outbreak that occurred on the 8th of December 2015, in Limpopo, RSA.

Species	Susceptible	Cases	Deaths	Destroyed	Slaughtered	Apparent morbidity rate	Apparent mortality rate	Apparent case fatality rate	Proportion susceptible animals lost*
Cattle	1,200	14	0	0	0	1.17%	0.00%	0.00%	0.00%

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

Map 12: Location of the FMD outbreak that occurred on the 8th of December 2015, in Limpopo, RSA.



Zimbabwe [1]

The WRLFMD detected FMDV SAT 1 and SAT 2 respectively in four and eleven bovine epithelium samples of the seventeen collected in Zimbabwe between April and August 2015, with one sample positive for both serotypes. Genotyping of the isolates respectively identified them as SAT 1/II (SEZ)/unnamed and SAT 2/II/unnamed. For the FMDV SAT 1 strains, the seq id (99.40 and 100%) of the fours isolates indicated their close genetic relationship. The most closely related field virus outside this group was SAT1/ZIM/P18/91 GN-11, a buffalo isolate, with a seq id of 90.35%, while the most closely related reference virus was SAT1/RV/11/37 (AY593839) with a seq id of 84.62%. The VP1 sequences of the FMDV SAT 2 isolated fell into three distinct genetic lineages within the topotype II. For the eleven FMDV SAT 2 isolates, a summary of the origin of the samples and genotyping results is presented in Table 16.

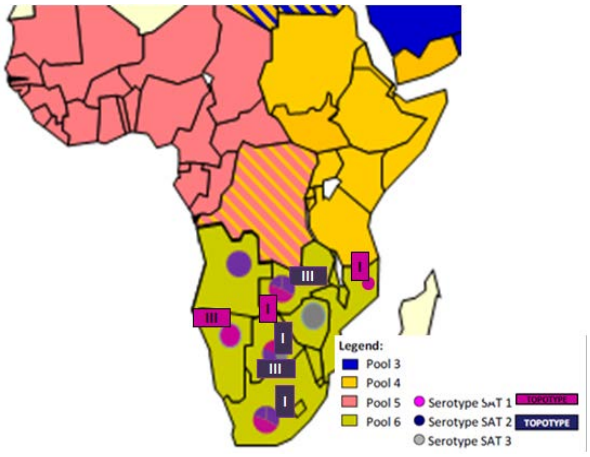
Table 16: summary of the origin of the samples and genotyping results relative to the FMDV SAT 2 isolates collected in Zimbabwe between April and August 2015.

Strain Identification	Location of sample collection	Date of collection	Most closey related field virus (seq id%)	Most closey related reference virus (seq id%)
ZIM/4/2015	Midlands	07/04/2015	SAT2/ZIM/9/2015 (99.85)	SAT2/ZIM/7/83 (AF136607) (88.12 - 90.74)
ZIM/5/2015		03/06/2015	SAT2/ZIM/15/2015 (99.85)	
ZIM/6/2015		06/06/2015	SAT2/ZIM/20/2015 (99.69)	
ZIM/9/2015		03/09/2015	SAT2/ZIM/4/2015 (99.85)	
ZIM/11/2015	Matabeland North	23/06/2015	SAT2/ZIM/1/2015 (99.38)	
ZIM/13/2015		07/07/2015	SAT2/ZIM/2/2010 (88.12)	
ZIM/15/2015	Midlands	17/07/2015	SAT2/ZIM/16/2015 (99.85)	
ZIM/16/2015		20/07/2015	SAT2/ZIM/15/2015 (99.85)	
ZIM/20/2015		12/08/2015	SAT2/ZIM/21/2015 (100.00)	
ZIM/21/2015		12/08/2015	SAT2/ZIM/20/2015 (100)	
ZIM/22/2015		18/08/2015	SAT2/ZIM/20/2015 (99.85)	

Table 17: Summary of the history of FMD Pool 6, 2012 – 2015, for geographic distribution see Map 13 below.

COUNTRY	FMD HISTORY FMDV serotypes, reported to OIE in 2012 – 2014	LAST OUTBREAK REPORTED/SEROTYPE #see pg. 1	Comment
Angola	2012/DISEASE SUSPECTED BUT NOT CONFIRMED 2013/DISEASE ABSENT 2014/NO DATA AVAILABLE	July 2015/ SAT 2	Follow –up and typing required
Botswana	2012-2014/SAT 2 2014/SAT 1	Jun 2015/typing pending July 2015/SAT 2, June 2015/SAT 1	See text Typing required
Congo D. R.	2012 – 2013/A, O, SAT 1	Jun 2013/not typed	Follow –up needed
Malawi	2012 -2013/NO REPORTED OUTBREAKS	Oct 2011, Sep 2015/typing pending	See text Follow –up needed
Mozambique	2012 -2013/DISEASE ABSENT, 2014/NO DATA AVAILABLE	July 2015/SAT 2, May 2015/ SAT 1	See text Follow –up needed
Namibia	2012-2013/SAT 1	May 2015/SAT 1, Jun 2015/SAT 2, July/typing pending	See text Typing required
South Africa	2012/SAT 2 2013/SAT 1	Aug 2013/SAT 1, Nov 2014/ SAT 2	See text Genotyping required
Zambia	2012/SAT 1, SAT 2	Jan 2013/SAT 1, SAT 2, Oct 2015/typing pending	See text Follow –up needed
Zimbabwe	2012-2013/SAT 2 2013/SAT 3 2014/SAT 1	Jun 2013/SAT 3, Sept 2014/SAT 1, Sep 2015/ SAT 2	See text

Map 13: FMD distribution by serotype and topotype for Southern Africa, 2011 – 2014 (EuFMD)



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 2014 [15]:

- Serotype SAT 1 (topotypes I, II and III)
- Serotype SAT 2 (topotypes I, II and III)
- Serotype SAT 3 (topotypes I, II and III)

G. POOL 7 – South America

South America [5, 15]

A great success had been obtained by South America with the absence of FMD outbreaks during the past four years.

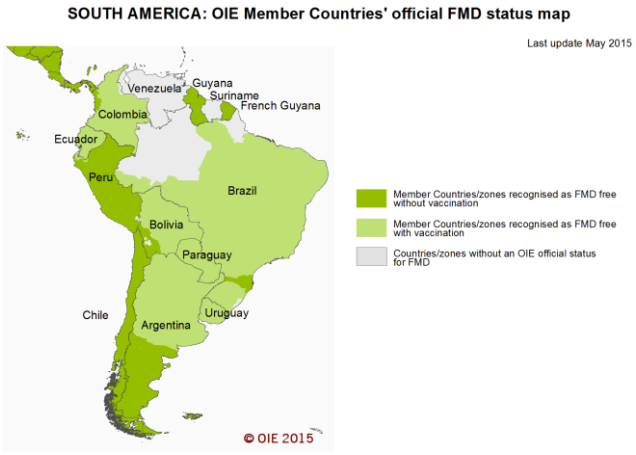
The OIE FMD status of the countries in South America as reported in April 2015 is presented in Map 14.

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 (Map 14). The FMD history between 2012 –2014 is given in Table 18.

Table 18: Summary of the history of FMD Pool 7, 2012 – 2014, for geographic distribution see Map 14 below

COUNTRY	FMD HISTORY FMDV serotypes, reported to OIE in 2012 2014	LAST OUTBREAK REPORTED/SEROTYPE #see pg. 1	Comment
Paraguay	DISEASE ABSENT	Dec 2011/O	
Venezuela	DISEASE ABSENT	2011/O, A	National situation needs verification

Map 14: FMD status for South America [5].



IV. OTHER NEWS:

[1]**The WRLFMD Quarterly Report April – June 2015** published the following table (Table 19) that contains a list of FMDV strains for antigen banks of FMD-Free countries. The discussion of this table is within the report.
The WRLFMD is at present working to adopt a risk-based approach for identifying FMDV lineages and relate these to priority vaccines for use in Europe and other FMD-free settings.

Table 19: Recommendations by the WRLFMD® on FMD virus strains to be included in FMDV antigen banks (for FMD -free countries) – June 2015
Note: Virus strains are NOT listed in order of importance

High Priority	O Manisa O PanAsia-2 *(or equivalent)* O BFS or Campos A24 Cruzeiro Asia 1 Shamir A Iran-05 *(or A TUR 06)* A22 Iraq SAT 2 Saudi Arabia *(or equivalent i.e. SAT 2 Eritrea)*
Medium Priority	A Eritrea 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

V. REFERENCES - Superscripts

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5. WAHID Interface – OIE World Animal Health Information Database http://web.oie.int/wahis/public.php?page=home
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8. National animal health diagnostic and investigation center (NAHDIC), Ethiopia - (*Dr. Daniel Gizaw*)
9. National FMD Reference Laboratory, Embakasi, Kenya - (*Dr. Abraham Sangula, Dr. Kenneth Ketter*)
10. Laboratoire National Vétérinaire (LANAVET) -Garoua, Cameroon - (*Dr. Simon Dickmu Jumbo)*
11. ACCRA Veterinary Laboratory, Ghana - (*Dr. Joseph Adongo Awuni*)
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15. OIE/FAO FMD Reference Laboratory Network, Annual Report 2014