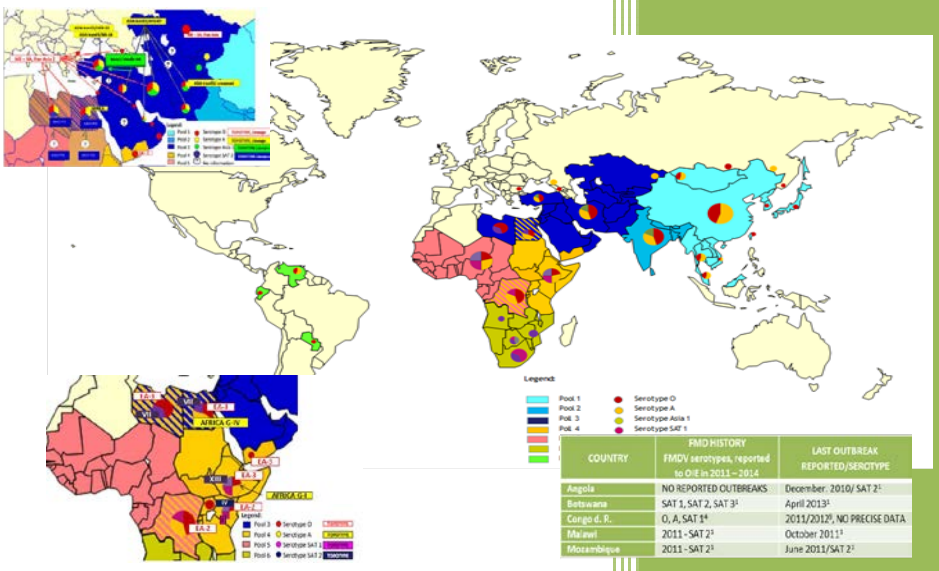
2015

Foot-and-Mouth Disease Situation
Monthly Report March 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[4]	2011/2012[9], NO PRECISE DATA
Malawi	2011 - SAT 2[3]	October 2011[1]
Mozambique	2011 - SAT 2[3]	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

March 2015

Guest Editor
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Head of WRLFMD,
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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

Overview:

I am pleased to be asked to write this short update for the EuFMD monthly report. The start of 2015 has been a very busy period for the WRLFMD team. Our new high-containment building (BBSRC National Virology Centre: The Plowright Building) has now been occupied, and the complex process of transferring our routine reference laboratory work is now underway, which will hopefully be completed by later in the summer.

I want to take this opportunity to expand on two new important FMD events in different regions that are covered in more detail in the different sections of this report. These are both on-going situations that have developed since my last editorial in December 2014.

Firstly, in the Republic of Korea (South Korea), >100 FMD outbreaks have now been reported since the first cases due to this particular FMD virus incursion were recognised in early December 2014. VP1 sequencing of representative viruses at the Animal and Plant Quarantine Agency in Korea, and at Pirbright has shown that the causative lineage for these outbreaks is O/SEA/Mya-98, and that these viruses are closely related, but probably distinct to viruses that caused earlier outbreaks in the country (during July 2014 and earlier in 2010). The majority of the affected premises have been pig farms and disease appears to have occurred in spite of a vaccination programme (with O1-Manisa). Although some questions still remain about whether the particular animals with clinical disease have been adequately vaccinated, other recent in-vivo data from Dr Wilna Vosloo and colleagues (CSIRO, Geelong - presented at the EuFMD Open Session in Cavtat in November) indicate that the O-Manisa vaccine does not provide adequate protection in pigs, although results for cattle were more encouraging. Based on these data, the recent events in Korea may not be that unexpected, and these findings highlight that work should now be undertaken to explore vaccine antigens that individually (or in combination) may generate an appropriate immune response in pigs against the O/SEA/Mya-98 lineage.

Secondly, a number of new FMD outbreaks have occurred in the Sidi Bel Abbes and Saida Provinces of Algeria during March 2015. Some of these new outbreaks that have occurred in goats and sheep are in a different region to areas that were affected during 2014. Genotyping of representative FMD viruses from these cases is now urgently required to confirm that these outbreaks are caused by the O/ME-SA/Ind-2001 lineage that has spread recently across Libya, Tunisia and Algeria. In view of the rapid spread of this lineage during 2013/14, a resurgence of new cases (now 12 outbreaks in 2015 [ed. update April 2015]) that is focussed further to the west than the outbreaks in 2014 (and closer to the border with Morocco) needs to be carefully monitored. Furthermore, the involvement of small ruminants in these outbreaks needs to be considered in the context of using vaccination to control these outbreaks. Together, these data reaffirm the importance of maintaining systems that follow the epidemiological patterns for FMD and the work of the OIE/FAO FMD Laboratory Network.

I. GENERAL OVERVIEW

Pools represent independently circulating and evolving 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).

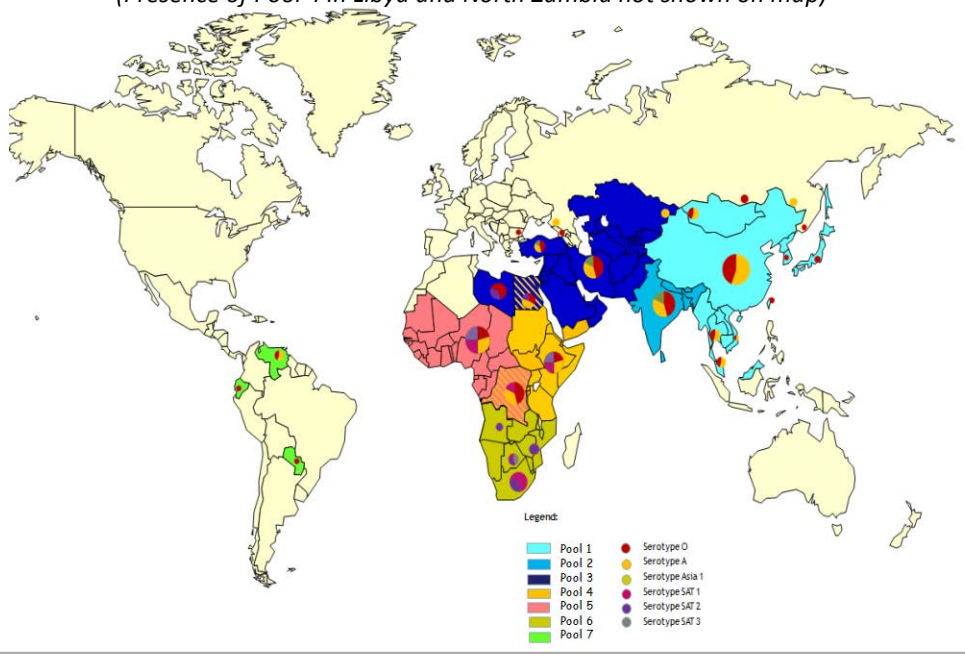
Table 1: List of countries representing each virus pool for the period 2010 – 2015

POOL	REGION/COUNTRIES – colour pools as in figure	SEROTYPES
1	**CENTRAL/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, Asia 1**
2	**SOUTH ASIA** Bangladesh, Bhutan, India, Nepal, Sri Lanka	**O, A, Asia 1**
3	**WEST EURASIA & MIDDLE EAST** Afghanistan, Algeria, Armenia, Azerbaijan, Bahrain, Bulgaria, **Egypt**, Georgia, Iran, Iraq, Israel, Jordan, Kazakhstan, Kuwait, Kyrgyzstan, Lebanon, **Libya**, Oman, Pakistan, Palestine Autonomous Territories, Qatar, Saudi Arabia, Syrian Arab Republic, Tajikistan, Tunisia, Turkey, Turkmenistan, Uzbekistan	**O, A, 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, 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, SAT 2**
6	**SOUTHERN AFRICA** Angola, Botswana, **Congo D. R.,** Malawi, Mozambique, Namibia, South Africa, Zambia, Zimbabwe	**{O, A}*, SAT 1, SAT 2, SAT 3**
7	**SOUTH AMERICA** Ecuador, Paraguay, Venezuela	**O, 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 *(Map 1)*

(Presence of Pool 4 in Libya and North Zambia not shown on map)



II. HEADLINE NEWS

POOL 1

Korea (Rep. of) [1, 2] **–** Further FMD outbreaks (40) caused by serotype O occurred between the 2nd and the 23rd of March 2015, on pig farms in various area of Korea (Rep. of).

Mongolia [1, 2] **–** Two new FMD outbreaks caused by FMDV serotype O occurred on the 1st and 2nd of March 2015, in Khovd, on two farms involving cattle, sheep and goats on one premises and only cattle on the other.

Southeast Asia [3] **–** While no new FMD outbreaks have been reported during March 2015, 210 outbreaks in Cambodia, Myanmar, Malaysia, Thailand and Viet Nam are reported as ongoing.

Russian Federation [4] **–** The Regional Reference Laboratory for FMD (ARRIAH, Russia) diagnosed FMDV serotypes A and O in clinical samples.

POOL 2

India [5] **-** The Project Directorate on Foot and Mouth Disease (PDFMD), Mukteswar, India, detected the circulation of FMDV serotypes Asia 1 and O.

POOL 3

Algeria [1, 2] **–** An FMD outbreak involving principally sheep, caused by serotype O, was reported on the 2nd of March 2015 and was followed by other 6 outbreaks in the two administrative units, El Bayadh and El Oued.

Pakistan [6]- Seventy-nine FMD outbreaks were reported during February 2015, throughout Pakistan, within the Progressive Control of Foot and Mouth Disease Project. Laboratory results reconfirmed the circulation of three FMDV serotypes A, Asia 1 and O, already reported in February 2015.

POOL 4

Ethiopia [7] **–** The National Animal Health Diagnostic and Investigation Centre (NAHDIC), Ethiopia, detected FMDV serotype SAT 2 in samples collected from an FMD outbreak.

Kenya [8]**–** The Foot-and-Mouth Disease Laboratory, Embakasi, Kenya diagnosed FMDV serotypes A, O and SAT 2 in clinical samples.

POOL 5

No reports of FMD outbreaks in this pool during the month of March.

POOL 6

Botswana [1, 2] **–** A new FMD outbreak was reported on the 9th of March 2015 in Ngamiland that was followed by other three episodes, all involving domestic cattle of a village. The FMDV serotype presently responsible for the events is SAT 2.

POOL 7

Latin America [1]- No outbreaks reported

COUNTER

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

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

III. DETAILED POOL ANALYSIS

A. POOL 1 – Central /East Asia

Korea (Rep. of) [1, 2]

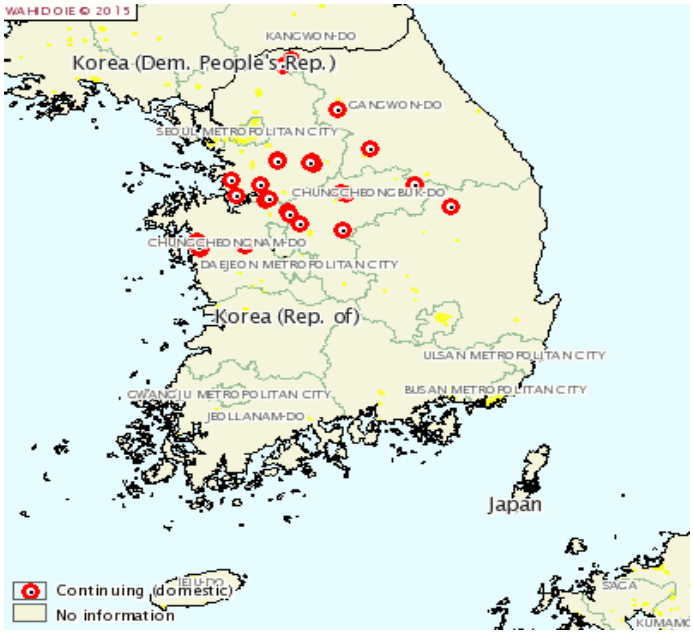
Another forty FMD outbreaks caused by serotype O occurred exclusively on pig farms in various areas of Korea (Rep. of) between the 2nd and the 23rd of March 2015. From the beginning of the current event that was initially reported on the 3rd of December 2014, 159 outbreaks have been registered, 154 involved pig farms. The latest outbreaks are spreading in a Northeast direction (Map 2).

A summary of the outbreaks is reported in Table 2 with their location presented in Map 2. Number of reported FMD outbreaks per week, from beginning of event to March 2015 in Korea (Rep. of) is presented in Graph 1.

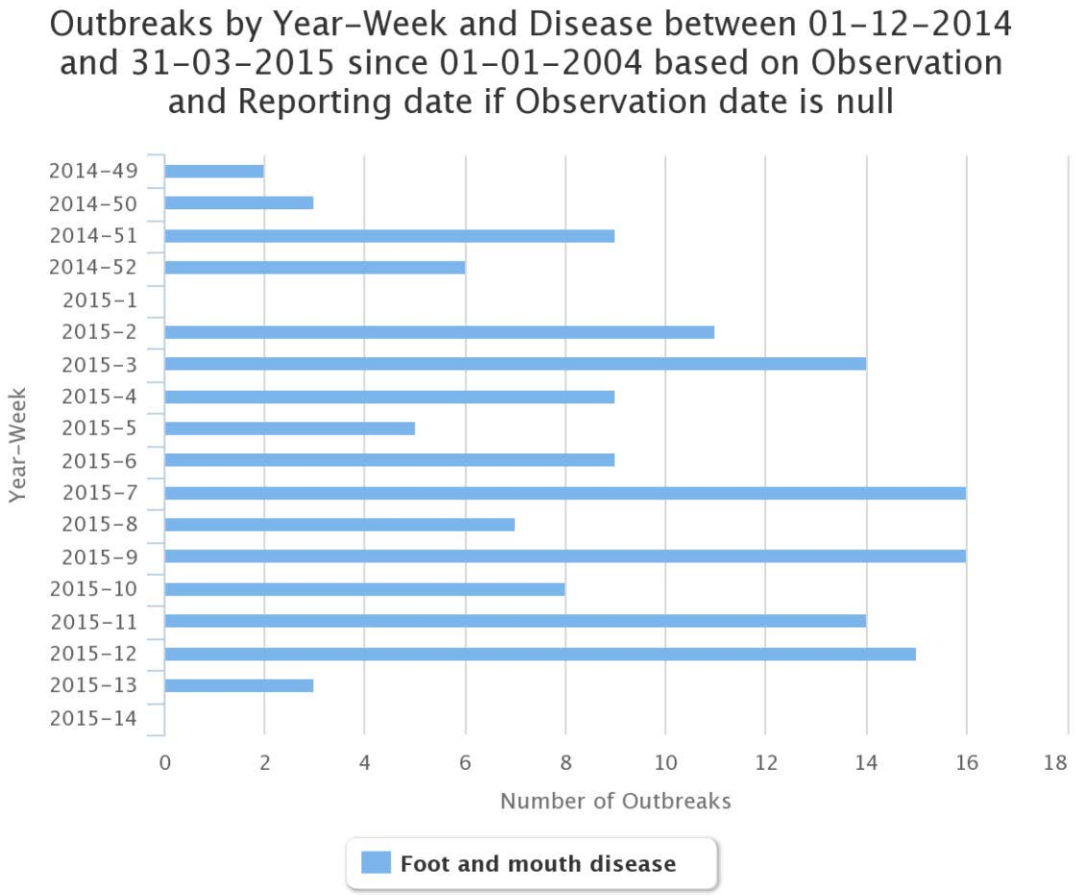
Table 2: summary of the locations and number of pigs involved in the outbreaks that occurred in Korea (Rep. of) during March 2015.

Administrative units in which FMD outbreak occurred	Species	Sum At Risk	Sum of Cases	Sum of Deaths	Sum Destroyed	Sum Slaughtered
Chungchongnam-do	domestic, swine	35462	351	0	0	0
Kang-won-do		10594	1022	0	994	0
Kyonggi-do		14426	1922	0	1780	0
Kyongsangbuk-do		1400	2	0	0	0
	Totals	**61882**	**3297**	**0**	**2774**	**0**

Map 2: Location of FMD outbreaks occurring during March 2015 in Korea (Rep. of) [1].



Graph 1[2]: trend of outbreaks per week following report of 1st FMD outbreak on 3rd of December 2014 in Korea. (Rep. of).



Mongolia [1, 2]

Two new FMD outbreaks, occurred on the 1st and 2nd of March 2015 caused by FMDV serotype O on two farms involving cattle, sheep and goats on one premises and only cattle on the other. These outbreaks were located in Khovd, in a similar region to the previous registered in February 2015. The diagnosis and serotyping were confirmed within a few days from the first outbreak, on the 6th of March 2015 by the State Central Veterinary Laboratory (National laboratory) using non-structural protein (NSP) ELISA, reverse transcription - polymerase chain reaction (RT-PCR) and gene sequencing.

Source of outbreaks is unknown or inconclusive and sanitary measures are still in place consisting in quarantine, movement control inside the country, screening, zoning and vaccination in response to the outbreaks.

A summary of the outbreaks is reported in Table 3 with location of outbreaks presented in Map 3.

Table 3: summary of the number of species involved in the outbreaks in Khovd, Mongolia since February 25th 2015.

Species	Susceptible	Cases	Deaths	Destroyed	Slaughtered	Apparent morbidity rate	Apparent mortality rate	Apparent case fatality rate	Proportion susceptible animals lost*
Cattle	Data not available	301	1	0	1	**	**	0.33%	**
Camelidae		14	0	0	0	**	**	0.00%	**
Goats		381	0	0	0	**	**	0.00%	**
Sheep		81	0	0	0	**	**	0.00%	**

*Removed from the susceptible population through death, destruction and/or slaughter **Not calculated because of missing information

Map 3: Location of FMD outbreaks that occurred during February and March 2015, in Khovd, Mongolia.

Russian Federation [4, 5]

The Regional Reference Laboratory for FMD (ARRIAH, Russia) diagnosed FMDV serotypes A and O in clinical samples. Genotyping of FMDV serotypes A and O identified them within the Sea-97 and Mya-98 genetic lineages respectively. ARRIAH is conducting studies on the antigenic relationship between epidemic isolates and vaccine strains of FMDV serotypes A and O. Post vaccination monitoring was carried out by examining 585 sera. Research on FMDV is being conducted by ARRIAH focused on the immunobiological properties of serotype SAT2.

ARRIAH was involved in the provision of materials and advice 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 Subjects.

Experts of the FGBI "Federal Centre for Animal Health" participated in the "Regional OIE Seminar on the Procedure of Recognition of the Member State's Freedom from FMD and on Validation of National FMD Control Program" which was held in Astana (the Republic of Kazakhstan) on March 26-27, 2015. The European Union and the Ministry of Agriculture of Kazakhstan supported the event.

The seminar was aimed at training the participants in preparation of dossiers to receive the OIE official recognition of the country as FMD-free with or without vaccination and on the procedures undertaken by OIE for the validation of National FMD control programs. Representatives of Tajikistan, Turkmenia, Uzbekistan, Kyrgyzstan, Georgia, Armenia, Azerbaijan took part in the seminar.

Participants studied standard operational procedures for the official recognition of the country as FMD free and for validation of National FMD control programs. Working groups underwent training in preparation of dossiers to receive the OIE official recognition of the country as FMD free.

Southeast Asia [3]

No reports of FMD outbreaks have been described during March 2015, in the countries reported in Table 4. Last reported outbreaks were in Viet Nam, in December 2014. The episodes ongoing from previous months add to a total of 210. The FMDV serotypes circulating are A, Asia 1 and O. Location of outbreaks is presented in Map 4.

Table 4: FMD outbreaks reported as ongoing during March 2015, in the countries of the Southeast Asia area, are listed below.

Country registering FMD outbreeaks	Prior outbreaks continuing
Cambodia	142
Myanmar	3
Malaysia	46
Thailand	4
Viet Nam	15
Total	**210**

Map 4: Location of FMD outbreaks reported as ongoing during March 2015 in the countries of the Southeast Asia area listed in Table 4 (SEAFMD).

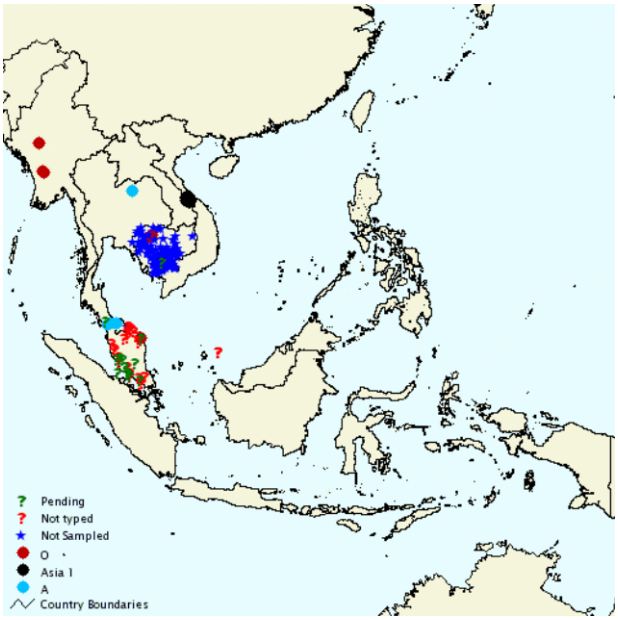


Table 5: Summary of the history of FMD Pool 1, 2012 – 2014, for geographic distribution see Map 5 below.

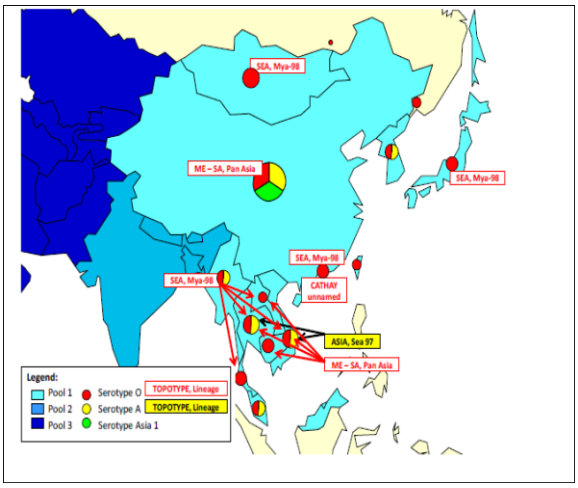
COUNTRY	FMD HISTORY FMDV serotypes, reported to OIE between 2012 – 2014	LAST OUTBREAK REPORTED/SEROTYPE[#]	Comment
Cambodia	O, 2013-2014/NOT SAMPLED	Jun 2014/O, Aug 2014/ not typed	Typing required
China (People's Rep. of)	2012-2013/O, 2013/A,	Nov 2014/O, Jan 2015/A	Genotyping required
China (Hong Kong, Sar)	O	Oct 2014/O	
China (Taiwan Province)	2012-2013/O,	Jul 2013/O	
Japan	FMD-FREE WITHOUT VACCINATION	Jul 2010/O	
Korea (DPR)	2012-2013/DISEASE ABSENT	May 2014/not confirmed, July 2014/O	
Korea (Rep. of)	2012-2013/DISEASE ABSENT	March 2015/O	See text

Laos PDR	2012/DISEASE PRESENT WITH QUANTITATIVE DATA BUT WITH AN UNKNOWN NUMBER OF OUTBREAKS	Mar 2013/O	
Malaysia	2012 –2013/O 2013/NOT TYPED	Jun 2014/O	Typing required
Mongolia	2013/A	Sept 2013/A, March 2015/O	See text Typing required
Myanmar	2012-2013/O	Jun 2014/O, July 2014/ not typed	Typing required
Russian Federation	2012/O, 2013/A	March 2015/O and A	See text
Thailand	O, A and NOT TYPED	Jun 2014 /A, Oct 2012/O, Sept 2014/not typed	Genotyping required
Vietnam	O, NOT SAMPLED 2013- 2014/A,	Apr 2013/A Jun 2014/O, July 2014/not typed	Typing required

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 [16]:

- Serotype O: O/SEA/Mya-98, O/ME-SA/PanAsia, O/CATHAY
- Serotype A: A/ASIA/Sea-97
- Serotype Asia-1 (not detected in the region since 2005 (Myanmar) and 2006 (Vietnam, P.R. China)



B. POOL 2 – South Asia

India [6]

The Project Directorate on Foot and Mouth Disease (PDFMD), Mukteswar, India, examined 22 clinical samples (18 samples from cattle and 4 from buffaloes) by antigen and/or RNA detection tests and FMDV serotypes O and Asia 1 were diagnosed. Nineteen field isolates, positive for FMDV serotype O, were subjected to vaccine matching tests. A total of 35,400 serum samples were tested for FMDV antibodies for epidemiological studies. The indigenous diagnostic kits developed at PDFMD, Mukteswar were used for these tests.

The laboratory personnel are constantly investigating FMD field outbreaks and provide expert advice to Government, national/local authorities or to other services. The laboratory is also involved in research studies and collaborations with international organisations.

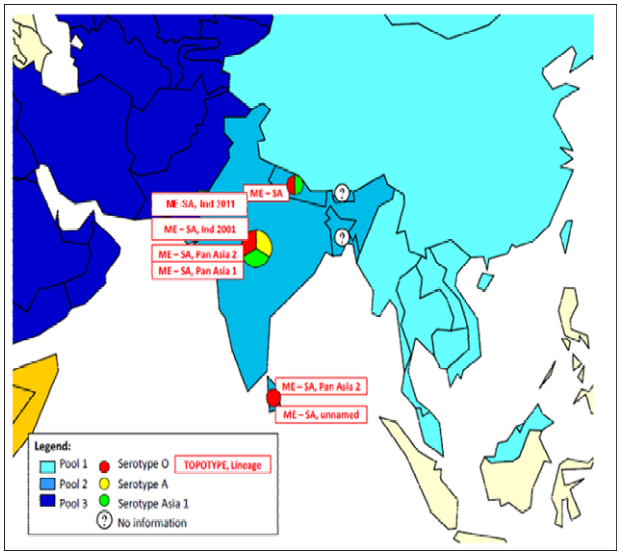
Table 6: Summary of the history of FMD Pool 2, 2012 – 2014, for geographic distribution see Map 6 below.

COUNTRY	FMD HISTORY FMDV serotypes, reported to OIE between 2012 – 2014	LAST OUTBREAK REPORTED/SEROTYPE#	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	March 2015/Asia1 and O	See text
Nepal	O, 2012-2103/Asia 1	Apr 2014/O	
Sri Lanka	2012 – 2013/O	Sept 2014/O	

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

Conjectured circulating FMDV lineages in pool 2 per 2014 [16]:

- O/ME-SA/Ind-2001 (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>

Algeria [1, 2]

An FMD outbreak, caused by FMDV serotype O, was reported on the 2nd of March 2015, after an interruption of their occurrence in the country for nearly five months. The previous outbreaks in the country, due to the same serotype, had started on the 25th of July 2014 and were resolved on the 12th of October 2014. While bovines were principally involved in the previous outbreaks, the present ones are mainly involving sheep.

The seven outbreaks recorded during March 2015 occurred in the two administrative units of El Bayadh and El Oued, which are respectively on the western and eastern ends of the northern area of the country (Map 7). The Constantine and Laghouat Regional Veterinary Laboratories initially diagnosed FMD on samples of sheep and cattle on the 4th of March, using NSP ELISA. FMD was confirmed on the 9th of March 2015 by the Central Veterinary Laboratory (National laboratory) on cattle samples, using real-time reverse transcriptase/polymerase chain reaction (RRT-PCR).

The source of the outbreaks is attributed to the introduction of new live animals. The control measures implemented consist in quarantine, vaccination, disinfection of infected premises. No treatment of affected animals is being carried out. A summary of the vaccination programme that has already been carried out is reported in Table 7, while that of the species involved in the outbreaks is reported in Table 8. Geographic location of the outbreaks is presented on Map 7.

Table 7: summary of type of species and number of animals vaccinated in the administrative units where the FMD outbreaks occurred in Algeria during March 2015.

Administrative division	Species	Number Vaccinated
EL BAYADH	Goats	5210
EL OUED	Cattle	367
EL BAYADH		691
	Sheep	49716
	Total	55984

Table 8: summary of the type and number of species involved in the outbreaks in El Bayadh and El Oued, Algeria during March 2015.

Species	Number of susceptible animals	Cases	Apparent morbidity rate
Cattle	24	1	4.16%
Goats	78	0	0.00%
Sheep	2230	42	4.84%
Total	2332	43	

Map 7: Location of FMD outbreaks occurring during March 2015 in Algeria.

Pakistan [7]

During the reporting period, the field veterinarians attended 79 FMD outbreaks. Affected animals (171) were provided free treatment and ring vaccination was carried out in 1147 animals at risk. Laboratory analysis indicated that three FMDV serotypes (A, Asia-1 and O) were circulating in the country. Landhi Cattle Colony (LCC) remained the hottest spot in the country where 41 out of 79 outbreaks were reported.

During March, 36,239 animals in different production systems (8,350 animals in dairy colony production system, 5,537 animals in market oriented rural smallholders, 1760 animals in government livestock farms and 20,592 on

cost-sharing basis) were given preventive FMD vaccination. Use of quality FMD vaccine according to the SOP developed by the Project has provided protection to animals against the disease. This successful demonstration has convinced a large number of farmers to start vaccinating their animals (including on cost-share basis) particularly against FMD. On cost sharing basis, a total of 20,592 animals were registered and vaccinated/ear tagged in Sindh and Punjab provinces. These included 5,117 animals in Karachi, and 15,475 animals at JK dairy farms Rahim Yar Khan, working with Engro Pvt Ltd and international Livestock Research Institute (ILRI).

Eight diagnostic labs continued providing FMD diagnostic and serotyping facilities in all provinces/regions of the country. Arrangements are being made to equip and make functional the 9th ELISA Laboratory, in Fata. ELISA kits, other expendables and technical backstopping were provided to these laboratories. Two week long training for the "Quality Control of Foot and Mouth Disease Vaccine" was arranged by the project from 17th to 28th of March at NVL, Islamabad. The services of an International consultant, Dr. Can Cokaliskan (Director Quality Control Section SAP institute, Turkey) were engaged for providing training on the subject. A total of 7 lab scientists from NVL (2), University of Veterinary and Animal Sciences Lahore (1), FMD Research Centre Lahore (1), Veterinary Research Institute Peshawar (1) and FAO-FMD Project (2) participated in the training workshop. During the training, SOPs were developed and hands-on training was provided to the participants.

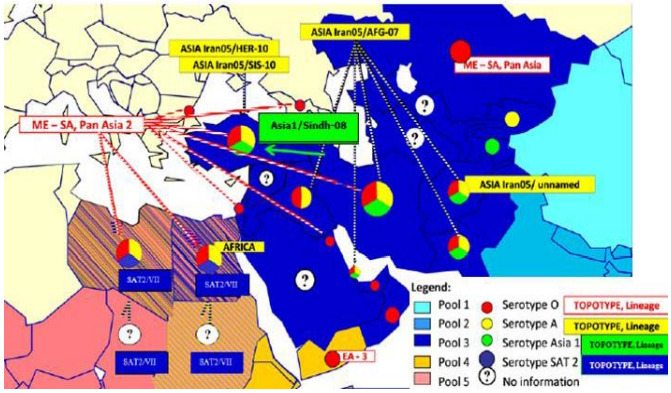
Three awareness seminars were organized respectively in Mohmand Agency, South Waziristan and FR Dera Ismail Khan FATA. A total of 41 farmers and field veterinary staff were educated in the areas of prevention and control of FMD.

Table 9: Summary of the history of FMD Pool 3, 2012 – 2014, for geographic distribution see Map 8 below.

COUNTRY	FMD HISTORY FMDV serotypes, reported to OIE in 2012 – 2014	LAST OUTBREAK REPORTED/SEROTYPE#	Comment (Genotyping or vaccine matching tests needed for this pool)
Afghanistan	2013/O, A, Asia 1, NOT TYPED 2012/SEROTYPE NOT REPORTED	2014/A, Asia 1, O	Genotyping required
Algeria	2014/O	March 2015/O	See text
Armenia	2012-2013/DISEASE ABSENT	Not available	Follow –up needed
Azerbaijan	DISEASE ABSENT	Jun 2001	Follow –up needed
Bahrain	2012 /O	Oct 2014/O	
Egypt	2012, 2014/SAT 2 2012 - 2014/O, A	May 2014 A , Oct 2014/O, April 2014	
Georgia	DISEASE ABSENT	2002	Follow –up needed
Iran	O, A, 2012-2013/Asia 1	Jun 2013/Asia 1, Apr 2014/O, A	
Iraq	2012-2013/O, A	Dec 2013/A, O -	Follow –up needed
Israel	2012-2013/O	Nov 2013/O	Follow –up needed
Jordan	DISEASE ABSENT	2006	Follow –up needed
Kazakhstan	2012/O 2012 –2013/A	Aug 2012/O, Jun 2013/ A	Follow –up needed
Kuwait	2012/O 2013 – 2014/ DISEASE ABSENT	Jan 2012/O	Follow –up needed
Kyrgyzstan	2012-2013/O, A	Apr 2013 /O, A, Aug 2014/NOT TYPED	Typing required
Lebanon	DISEASE ABSENT	03/2010	Follow –up needed
Libya	NO DATA AVAILABLE	Oct 2013/O	Follow –up needed
Oman	2012-2013/O	Dec/2013	

Pakistan	DISEASE LIMITED TO ONE OR MORE ZONES	March 2015 / A, Asia 1, O	See text - genotyping required for most recent isolates
Autonomous Territories Palestine	O, 2012-2013 - SAT 2	Mar 2013/Sat 2, Nov 2014/O	
Qatar	2012-2013/O	Dec 2013/O	Follow –up needed
Saudi Arabia	2013/O	Nov 2013/O	
Syrian Arab Republic	DISEASE ABSENT	Mar/2002	Follow –up needed
Tajikistan	2012/NOT TYPED 2013/DISEASE ABSENT	Nov 2011/Asia 1, Nov 2012/ NOT TYPED	
Tunisia	2014/O	Oct 2014/O	
Turkey	Asia 1, A, O, NOT TYPED	Nov 2014/O, Feb 2015/ A and Asia 1	
Turkmenistan	NO DATA AVAILABLE	Not available	Follow –up needed
Uzbekistan	NO DATA AVAILABLE	Not available	

Map 8: FMD distribution by serotype and topotype for West Eurasia and Middle East, 201 – 2014 (EuFMD).



Conjectured circulating FMDV lineages in pool 3 per 2014 [16]:

- O/ME-SA/PanAsia-2 (predominantly from ANT-10 and FAR-09 sub-lineages)
- O/ME-SA/Ind-2001 (recent incursion per 2013 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).

D. POOL 4 – Eastern Africa

Ethiopia [8]

The National Animal Health Diagnostic and Investigation Centre (NAHDIC), Ethiopia, collected 21 sera and 3 tissue samples from an FMD outbreak. All resulted negative except for one sample in which FMDV serotype SAT 2 was detected. This will be forwarded for confirmation to the WRLFMD.

FMD antibody detection was conducted on 481 samples and 63 samples were positive for NSP antibodies. NAHDIC has been given support by IAEA through the provision of NSP ELISA kits for FMD.

Experts from the laboratory were involved in the FMD outbreak investigation from which the above-mentioned samples were collected.

The laboratory was also involved in the training of experts on protocols of the cross-sectional survey of various diseases, including FMD, CBPP, PPR and RVF, in collaboration with Ministry of Agriculture and the African Union – International Bureau for Animal Resources and national surveillance for these diseases will start shortly.

Kenya [9]

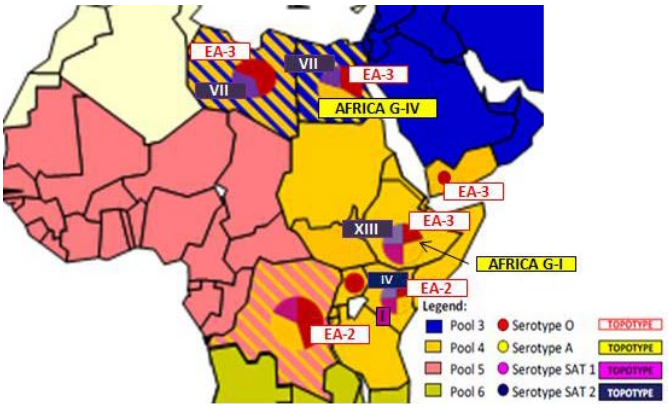
The Foot-and-Mouth Disease Laboratory, Embakasi, Kenya detected FMDV serotype A (1), O (2) and SAT2 (1) in thirteen clinical samples tested. The laboratory also carried out pre-export screening for FMD.

Table 10: Summary of the history of FMD Pool 4, 2012 – 2014, for geographic distribution see Map 9 below.

COUNTRY	FMD HISTORY FMDV serotypes, reported to OIE in 2012 - 2014	LAST OUTBREAK REPORTED/SEROTYPE[#]	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	Jan-June 2014/O, A, SAT2	
Eritrea	2012/O	Jan 2012/O	Follow –up needed
Ethiopia	O, 2012/A, SAT 2	Jun 2014/A, Feb 2015/O, Jan 2015/confirmation pending, March 2015/SAT 2,	See text Genotyping required for most recent isolates
Kenya	O, SAT1, SAT2, 2012 – 2013/A, 2012/NOT TYPED	March 2015/ A, O and SAT 2	See text Genotyping required
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,	Mar 2013/O Apr2013/ A, SAT 1, SAT2	
Uganda	2012/O, SAT 1 2012-2013/NOT TYPED	May 2014-Jan 2015/O, A, SAT1, 2 and 3	Genotyping required
Yemen	2012/O 2013 – 2014/ DISEASE PRESENT BUT WITHOUT QUANTITATIVE DATA	Not available	Follow –up needed

Map 9: 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 [16]:

- O (topotypes EA-2 (Kenya, Tanzania, DR Congo, Uganda), EA-3 (Ethiopia, Eritrea, Sudan, Egypt) 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)
- 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)

E. POOL 5 – West / Central Africa

Cameroon [10]

The Laboratoire National Vétérinaire (LANAVET) –Garoua did not report the diagnosis of FMDV during March 2015. However, the laboratory personal was involved in the investigation of FMD outbreaks in the field and in providing expert advice to Government services national/local authorities and other services. The laboratory is continuing with its research collaborative projects with Plum Island Animal disease Centre and Ohio state university, USA.

Ghana [11]

No FMD outbreaks were reported for the country during March 2015.

Nigeria [12]

No FMD outbreaks were reported for the country during March 2015.

Senegal [13]

The Laboratoire National de l'Elevage et de Recherches Vétérinaires (LNERV, Senegal) will be involved in the testing of samples for FMD that the veterinary services are currently collecting within the TCP/FAO/DSV/SN3502.

Table 11: Summary of the history of FMD Pool 5, 2012 – 2014, for geographic distribution see Map 10 below.

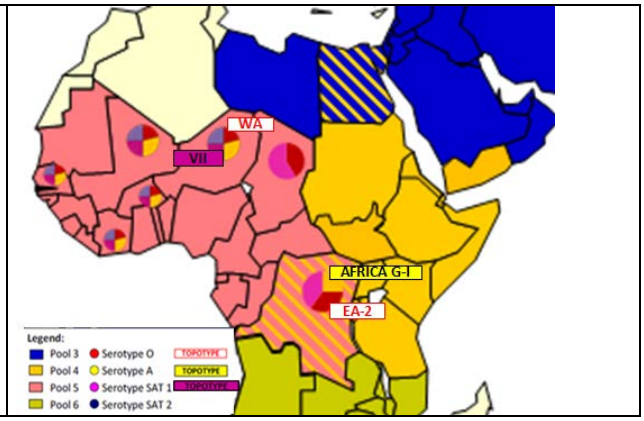
Country	FMD history FMDV serotypes, reported to OIE in 2012 – 2014	Last outbreak reported/serotype[#]	Comment (Genotyping would be useful for this region)
Benin	A, O, SAT 1, SAT 2	Jun 2014/O, A, SAT 1, SAT 2	
Burkina Faso	SEROTYPES NOT REPORTED	2013/ not available	Follow –up needed
Cameroon	SEROTYPES NOT REPORTED	Apr 2014/ A, Nov 2014/O, SAT 2, May 2014/SAT 1, Jun 2014, Jan 2015/untyped	Genotyping required for most recent isolates
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	
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	Identification required 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	Not available	
Niger	2012 – 2014/NOT SAMPLED	2014/not sampled	Identification required
Nigeria	2012 – 2014/NOT SAMPLED	Sept 2014/SAT 1, SAT 2, Sept 2014/O Feb 2015/ A	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	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 10 FMD distribution by serotype and topotypes for West Africa, 2011 – 2014 (EuFMD)

Conjectured circulating FMDV lineages in pool 5 per 2014 [16]:

- 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 [1, 2]

An FMD outbreak was reported on the 9th of March 2015 in Ngamiland followed by further three episodes, involving the domestic cattle of a village. The affected cattle are those grazing in a communal area. The first of the series of the current outbreaks was located outside the FMD free zones without vaccination. An animal with oral lesions was detected during clinical inspection prior to loading for slaughter at the local abattoir. Trace-back to the crush of origin revealed further 19 cases with clinical signs similar to those of FMD. Source of the outbreaks or origin of infection is attributed to illegal movement of animals or to contact with infected animals at grazing/watering. The diagnosis was carried out by the Botswana Vaccine Institute (OIE's Reference Laboratory) on cattle samples by virus isolation that was reported as positive on the 17th of March 2015. The FMDV responsible for the current events is SAT 2.

Containment and preventive measures applied are control of wildlife reservoirs, zoning, and vaccination in response to outbreaks movement control inside the country are to be yet applied.

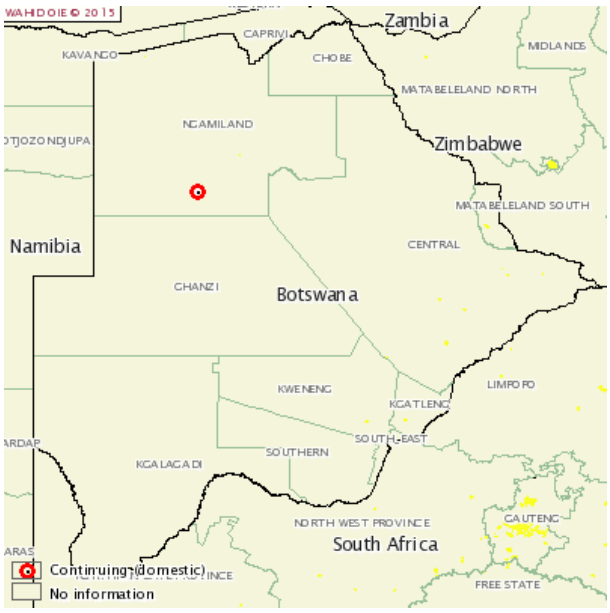
Mass vaccination is being carried out with trivalent SAT 1, 2 and 3 vaccine of all cattle in zone 2 of Ngamiland with the inoculation of 24,939 cattle.

A summary of the outbreak is reported in Table 12 with location of outbreak is presented in Map 11.

Table 12: summary of the number of cattle involved in the FMD outbreak reported in Ngamiland, Botswana during March 2015.

	Sum At Risk	Sum of Cases	Sum of Deaths	Sum Destroyed	Sum Slaughtered
	3304	14	0	0	0
	439	9	0	0	0
	1434	24	0	0	0
	500	20	0	0	0
Totals	**5677**	**67**	**0**	**0**	**0**

Map 11: Location of FMD outbreaks reported in Ngamiland, Botswana during March 2015.



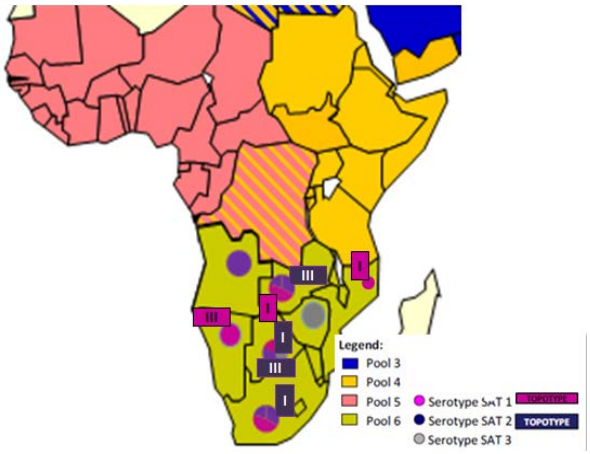
RSA [13]

The ARC-Onderstepoort Veterinary Institute is carrying out serotyping of FMDV in clinical samples. Serological testing was conducted for trade and movement purposes. The laboratory is also involved in providing expert advice to Government services national/local authorities and is carrying out research studies on FMD.

Table 13: Summary of the history of FMD Pool 6, 2012 – 2014, for geographic distribution see Map 12 below.

COUNTRY	FMD HISTORY FMDV serotypes, reported to OIE in 2012 – 2014	LAST OUTBREAK REPORTED/SEROTYPE#	Comment
Angola	2012/DISEASE SUSPECTED BUT NOT CONFIRMED 2013/DISEASE ABSENT 2014/NO DATA AVAILABLE	Dec 2010/ SAT 2	Follow –up needed
Botswana	2012-2014/SAT 2 2014/SAT 1	March 2015/SAT 2, Oct 2014/SAT 1	See text Follow –up needed
Congo D. R.	2012 – 2013/A, O, SAT 1	Jun 2013/not typed	Follow –up needed
Malawi	2012 -2013/NO REPORTED OUTBREAKS	Oct 2011	Follow –up needed
Mozambique	2012 -2013/DISEASE ABSENT, 2014/NO DATA AVAILABLE	Oct 2014/SAT 2	Genotyping required
Namibia	2012-2013/SAT 1	Dec 2014/SAT 2, Jan 2015/typing pending	Serotyping 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	Follow –up needed
Zimbabwe	2012-2013/SAT 2 2013/SAT 3 2014/SAT 1	Jun 2013/SAT 3, Sept 2014/SAT 1, Feb 2015/SAT 2	Follow –up needed

Map 12: 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 [16]:

- 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 [1]

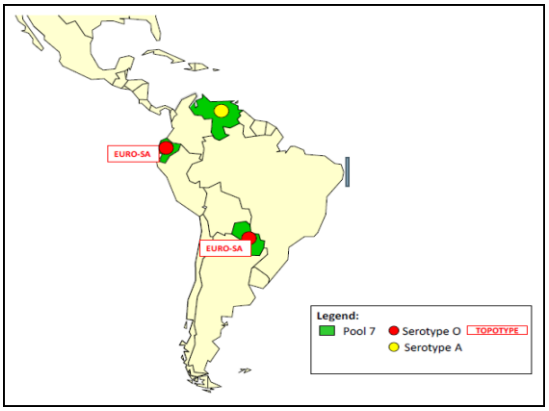
No new outbreaks have been reported during March and it is now more than three years since the last FMD outbreak in South America was reported.

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) or without vaccination (Argentina, Bolivia, Brazil, Colombia, Peru) 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 (Table 14 and Map 13). The FMD history between 2011 –2013 given in Table 14.

Table 14: Summary of the history of FMD Pool 7, 2012 – 2014, for geographic distribution see Map 13 below

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

Map 13: FMD distribution by serotype and topotype for South America, 2011 – 2013 [16] (EuFMD).



IV. OTHER NEWS:

Bahrain [14]

A total of 293 FMD cases have so far been identified in 13 farms and urgent measures to control the disease outbreak in the country were ordered by the Prime Minister who has also directed immediate precautionary measures. Ministry Under-Secretary for Agriculture and Marine Resources directed officials to intensify measures taken when the first case was discovered on the 23rd of February 2015. They were instructed to enforce measures, including cleansing, quarantine, immunisation and the establishment of buffer zones to separate infected animal farms. They were also directed to immunise herds in the farms surrounding the affected area. The Directorate of Agriculture and Marine Resources had announced that three cases had been found among 300 cattle kept in two farms.

Kenya [14]

Clinical cases of FMD were reported in Nakuru West, Kiamunyi, Menengai and Nakuru East, Kenya.

Nigeria [14]

About 200 cattle in Toro Local Government Area of Bauchi State of Nigeria have been infected with FMD.

Philippines [14]

The Department of Agriculture Secretary hosted with the Office of International des Epizooties (OIE) the 21st OIE Sub-Commission Meeting for FMD in South-East Asia and China from March 10th to 13th, 2015 in Manila. Around 100 representatives from all Southeast Asian countries plus China, the OIE and its technical partners, the private sector, the academia and donor countries attended the meeting. Officials and technical experts provided an update of the current FMD situation in the region and efforts to control and eradicate the disease.

It was informed that the Philippines has maintained an FMD-free status—without vaccination—through progressive zoning approach working in the effort to reach this with other countries, through the OIE, for FMD control.

Rwanda [14]

The Ministry of Agriculture confirmed a new outbreak of FMD in Nyagatare District in the Eastern Province on the 13th of March 2015. The disease has involved the corridor that stretches, Nyagatare, Gatsibo, Kayonza and Kirehe, districts neighbouring Tanzania. Clinical FMD was observed in at least 100 cows in Karangazi Sector farms, but it was not yet clear how many animals have been affected. The veterinarians, who said the disease could have originated from Tanzania, were still investigating another possible outbreak in other farms of the district.

A representative of Rwanda Animal Resources Development Authority (Rada) in Nyagatare District said that a quarantine zone has been put in place around the affected areas.

V. REFERENCES - Superscripts

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5. Rosselkhoznadzor / News Federal Service for Veterinary and Phytosanitary Surveillance - http://www.fsvps.ru/fsvps/news/13056.html?_language=en
6. Project Directorate on Foot and Mouth Disease (PD-FMD), Indian Council of Agricultural Research, Mukteswar, India (*Dr B. B. Dash*) FAO
7. Progressive Control of Foot and Mouth Disease in Pakistan, GCP/PAK/123/USA - (*Dr. Manzoor Hussain*, National Project Director and *Dr. Muhammad Afzal*, Project Coordinator)
8. National animal health diagnostic and investigation center (NAHDIC), Ethiopia - (*Dr. Daniel Gizaw*)
9. National FMD Reference Laboratory, Embakasi, Kenya - (*Dr. Abraham Sangula*)
10. Laboratoire National Vétérinaire (LANAVET) -Garoua, Cameroon - (*Dr. Simon Dickmu Jumbo*)
11. ACCRA Veterinary Laboratory, Ghana - (*Dr. Joseph Adongo Awuni)*
12. FMD Research Centre, Virology Research Department, National Veterinary Research Institute, Vom, Plateau State, Nigeria - (Dr. Ularamu Hussaini)
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