



# WRLFMD Quarterly Report

## January-March 2012

Reference Laboratory Contract Report

4/27/2012

WRLFMD

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**OIE/FAO Reference Laboratory Contract Report<sup>1,2</sup>  
January-March 2012**

**Foot-and-Mouth Disease**

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<sup>2</sup> Copies of all the individual reports cited herein can be obtained from Dr. Jef Hammond, IAH-Pirbright, [jef.hammond@iah.ac.uk](mailto:jef.hammond@iah.ac.uk).

## Summary

### ASIA

#### *Afghanistan*

FMD **type O** PanAsia-2<sup>ANT-10</sup> continues to circulate as does **type A** Iran-05HER-10 and **type Asia 1** Sindh-08 (newly designated name).

#### *Bahrain*

FMD **type O** PanAsia-2<sup>ANT-10</sup> and **type SAT2** IV/Ken-09 were detected in imported animals in quarantine. This is the first known occurrence of SAT 2 in Bahrain.

#### *Iran*

Two FMD **type O** sublineages were found in Iran, PanAsia-2<sup>ANT-10</sup> and PanAsia-2<sup>FAR-09</sup>. Similarly, two FMD **type A** sublineages were also detected Iran/05<sup>HER-10</sup> and Iran/05<sup>SIS-10</sup>. FMD **type Asia 1** Sindh-08 was also detected.

#### *Israel*

An outbreak of FMD **type O** occurred in sheep on 18/03/2012 at Rahat, Beer-Sheva, Hadarom. Genotyping showed the causative virus as O/ME-SA/PanAsia-2<sup>ANT-10</sup> (see below).

#### *Kazakhstan*

On 25/12/2011 and 26/12/2011 three outbreaks of FMD **type O** occurred in cattle and sheep in Urdzharsky, East Kazakhstan. No genotyping has been reported, however, results obtain by FGI-ARRIAH showed that previous outbreaks in the region belonged to O/ME-SA/PanAsia and were closely related to viruses from Vietnam and P.R. China (Guizhou) (see also the report on the Russian Federation below).

Five outbreaks of FMD **type O** were reported in cattle and sheep between 19/02/2012 and 27/02/2012 in South-east Kazakhstan (Dzhambul/Alma-Ata), close to the border with Kyrgyzstan. No genotyping information is available.

Two outbreaks of FMD **type A** were reported on the 15/02/2012 (cattle and sheep) and 19/02/2012 (cattle) in Moyinkumsky, Dzhambul. No genotyping information is available.

#### *Kuwait*

FMD **type O** ME-SA/PanAsia-2<sup>ANT-10</sup> was found in various parts of the country.

#### *Pakistan*

FMD **type A** Iran-05<sup>HER-10</sup> and **type Asia 1** Sindh-08 were detected.

#### *People's Republic of China*

An outbreak of FMD **type O** was reported in cattle on the 19/02/2012 at Gucheng, Pengyang, Guyuan, Ningxia. No genotyping information is available.

#### *Russian Federation*

Outbreaks of FMD **type O** occurred on 26/02/2012 (Village Usachevka, Khorol'sky raion, Primorskiy Kray in cattle, sheep and goats) and 04/03/2012 (Village Pospelovka, Oktyabrsky raion, Primorskiy Kray in cattle). Nucleotide sequencing was carried out at FGI-ARRIAH and showed that the viruses belonged to the O/ME-SA/PanAsia genetic lineage and were closely related to the isolates involved in the FMD outbreaks in China and Eastern Kazakhstan in 2011.

*Taiwan POC**Peng-hu county*

19/01/2012: Some of the feeder pigs at a quarantine station, which were transported from Taiwan Island to Makung City, Penghu Island, were found with vesicular lesions. FMD **type O** virus was isolated but No genotyping has yet been reported.

*Kinmen county*

Three outbreaks of FMD **type O** were reported in pigs showing clinical disease on the island of Kinmen (close to the Chinese mainland) on 01/02/2012 and 07/02/2012 in Jinning Township and on 09/02/2012 in Jinsha Township. The gene sequence of the isolated virus from outbreak 1 shows serotype O SEA topotype.

*Main island*

Six outbreaks of FMD **type O** have been reported, all in clinically healthy pigs and based on serology only. These all occurred on the Taiwan main island: 18/02/2012 in Jhushan Township, Nan-T'ou; 16/02/2012 in Yanshuei District, T'ai-Nan; 18/02/2012 in Yanshuei District, T'ai-Nan; 01/03/2012 in Jiaosi Township, I-Lan; 06/03/2012 in Jhutian Township, P'ing-Tung; and 30/03/2012 in Erlin Township, Chang-Hua. No genotyping has yet been reported.

*Thailand*

The receipt of two FMD **type A** VP1 sequences from the Thailand Regional Reference Laboratory indicated the continued presence of the Sea-97 lineage.

*Turkey*

FMD **type O** PanAsia-2<sup>ANT-10</sup> and **type A** Iran/05<sup>SIS-10</sup> were detected. FMD **type Asia 1** Sindh-08 continues to cause outbreaks.

*United Arab Emirates*

FMD **type O** ME-SA/PanAsia-2<sup>ANT-10</sup> was found in a single sample.

*Vietnam*

Two older samples (from 2008) contained, in one case FMD **type O** ME-SA/PanAsia and in the other case O CATHAY. FMD viruses isolated from samples collected in 2011 and 2012 were identified as O ME-SA/PanAsia.

**AFRICA***Egypt*

FMD **type A** was detected in samples collected in 2010 and 2011. Genotyping showed these to belong to the ASIA topotype, Iran-05<sup>BAR-08</sup> sublineage. A virus isolated from single sample collected in 2012 belonged to the AFRICA topotype, sublineage G-IV<sup>ISM-12</sup>. This was found to be most closely related to viruses from Sudan and Eritrea suggesting yet another recent introduction of FMDV from sub-Saharan Africa.

FMD **type O** viruses were isolated from three samples collected in 2011 and were genotyped as O/ME-SA/PanAsia-2. They were most closely related to a virus from Egypt in 2010.

Between 18/02/2012 and 26/03/2012, 43 outbreaks of FMD **type SAT 2** were reported in Egypt affecting the governorates of Al Sharqia (Ash Sharqiyah), Alexandria (Al Iskandariyah), Beheira (Al Buhayrah), Dakahlia (Ad Daqahliyah), Damietta (Dumyat), Gharbia (Al Gharbiyah), Ismailia (Al Isma'iliyah), Kafr el-Sheikh (Kafr Ash Shaykh), Luxor (Luxor), Minya (Al Minya), Monufia (Al Minufiyah), New Valley (Al Wadi Al Jadid), Qalyubia (Al Qalyubiyah), Sohag (Suhaj). This is the first known occurrence of this serotype in Egypt since 1950.

It was found that the Egyptian viruses belonged to SAT2 topotype VII. However, within this topotype the VP1 sequences of the Egyptian viruses fell into 2 distinct lineages while the Libyan viruses (see below) were in a 3<sup>rd</sup> distinct lineage. Each lineage differed by more than 10 percent of the nucleotides in VP1. One genetic lineage, designated SAT2/VII/Ghb-12, has been found in the Egyptian provinces of Faiyum, Gharbia, Giza, Kafr el-Sheikh, Minya, Monufia, Qalyubia, and Suez. The 2<sup>nd</sup> lineage, named SAT2/VII/Alx-12, has been detected in Alexandria province.

### *Ethiopia*

FMD **type O** EA-3 was found, however, the single isolate from the Tigray region belonged to a lineage distinct from viruses found in the centre of the country.

### *Libya*

Between 18/12/2011 and 12/02/2012, 23 outbreaks of FMD **type O** were reported in cattle (and some sheep) in Benghazi, Derna, Khoms, Misrata, Zawiya and Zlitan. The VP1 sequences of 11 viruses isolated at the WRLFMD were determined and shown to be O/ME-SA/PanAsia-2<sup>ANT-10</sup> (see below).

On 11/02/2012 FMD **type SAT 2** was found at Abuatni, Benghazi. VP1 genotyping of three virus isolates showed them to belong to SAT 2 topotype VII, lineage Lib-12. This is the same topotype that occurred in Libya in 2003, but the two lineages differ by 8.8%. The 2003 virus has been designated as lineage Lib-03.

### *Namibia*

Following two outbreaks of FMD **type SAT 1** in the Caprivi Strip in November and December 2011, two further outbreaks of the same serotype were reported in cattle on the 18/12/2011 (Ngoma Crushpen, Caprivi) and 05/01/2012 (Ikumwe Crushpen, Caprivi). It has been reported that both outbreaks were as a result of illegal movement of cattle from Masikili area. No genotyping information is available.

### *South Africa*

Two outbreaks of FMD **type SAT 2** were reported, three months apart, in cattle in Mbombela, Mpumalanga (30/12/2011) and Bushbuckridge, Mpumalanga (04/04/2012). These were within the surveillance zone of South Africa's FMD control zone. Cattle in this zone are vaccinated against FMD. No genotyping information is available.

### *Tanzania*

FMD **type SAT 2** topotype IV was detected in the north of Tanzania, from samples collected in 2011.

### *Zambia*

An outbreak of FMD **type SAT 2** was found on 24/01/2012 in cattle in the Mwamba Kaka area, Mbala District, Northern Province. Partial VP1 sequencing was performed by the BVI and analysis performed at the WRLFMD. The virus was shown to belong to SAT 2 topotype IV and to be most closely related to viruses isolated in the north of Tanzania in 2011 (see below).

## **SOUTH AMERICA**

No new outbreaks of FMD were reported in the region.

### **Uncharacterised FMD viruses**

A number of outbreaks have occurred where samples have not been sent to the WRLFMD. It is probable that the countries involved have performed their own genetic characterisation; however, through the OIE/FAO laboratory network we would also like to encourage the submission of samples (or complete VP1 sequences) to the WRLFMD.

An up-to-date list and reports of FMD viruses characterised by sequencing can be found at the following website: [http://www.wrlfmd.org/fmd\\_genotyping/2012.htm](http://www.wrlfmd.org/fmd_genotyping/2012.htm).

**IMPORTANT NOTE: WRLFMD vaccine recommendations have been changed from the previous report (Annex 3).**

Following extensive laboratory testing at WRLFMD the 'O PanAsia-2' virus strain has been added to the high priority list of strains as from this report.

A careful watch is still being maintained for further outbreaks of Asia 1 and any isolates obtained are tested for vaccine matching as rapidly as possible.

Results from samples received at WRLFMD (status of samples being tested) are shown in Table 1 and a complete list of clinical sample diagnostics made by the WRLFMD between January and March 2011 is shown in Annex 1 Table A. A record of all samples received to IAH-Pirbright (January to March 2011) is shown in Annex 1 Table B.

**Table 1:** Status of sequencing of samples received by the WRLFMD from January to March 2012.

Batch	Date Recd.	Country	Serotype	No. of samples	No. of sequences	Status
WRLFMD/2012/00001	03/01/2012	Vietnam	O	4	4	Completed
WRLFMD/2012/00002	13/01/2012	Tanzania	SAT 2	6	6	Completed
WRLFMD/2012/00003	18/01/2012	Japan	O	1	1	Completed
WRLFMD/2012/00004	20/01/2012	United Arab Emirates	O	1	1	Completed
WRLFMD/2012/00005	31/01/2012	Libya	O	11	11	Completed
WRLFMD/2012/00006	03/02/2012	Ethiopia	O	16	16	Completed
WRLFMD/2012/00007	02/02/2012	Turkey	O	1	1	Completed
WRLFMD/2012/00007	02/02/2012	Turkey	A	6	6	Completed
WRLFMD/2012/00007	02/02/2012	Turkey	Asia 1	12	12	Completed
WRLFMD/2012/00008	16/02/2012	Pakistan	A	3	3	Completed
WRLFMD/2012/00008	16/02/2012	Pakistan	Asia 1	7	7	Completed
WRLFMD/2012/00009	16/02/2012	Afghanistan	O	3	3	Completed
WRLFMD/2012/00009	16/02/2012	Afghanistan	A	4	4	Completed
WRLFMD/2012/00009	16/02/2012	Afghanistan	Asia 1	5	5	Completed
WRLFMD/2012/00010	27/02/2012	Libya	O	1	1	Completed
WRLFMD/2012/00010	27/02/2012	Libya	SAT 2	3	3	Completed
WRLFMD/2012/00011	12/03/2012	Egypt	O	3	3	Completed
WRLFMD/2012/00011	12/03/2012	Egypt	A	8	8	Completed
WRLFMD/2012/00011	12/03/2012	Egypt	SAT 2	11	11	Completed
WRLFMD/2012/00012	24/02/2012	Iran	O	7	7	Completed
WRLFMD/2012/00012	24/02/2012	Iran	A	9	9	Completed
WRLFMD/2012/00012	24/02/2012	Iran	Asia 1	17	17	Completed
WRLFMD/2012/00013	13/03/2012	Kuwait	O	12	12	Completed
WRLFMD/2012/00015	28/03/2012	Vietnam	O	13	13	Completed
WRLFMD/2012/00016	30/03/2012	Bahrain	O	2	2	Completed
WRLFMD/2012/00016	30/03/2012	Bahrain	SAT 2	4	4	Completed
Total				170	170	

**Detailed Analysis:**

**ASIA**

**Afghanistan**

WRLFMD/2012/00009

Date received: 16/02/2012

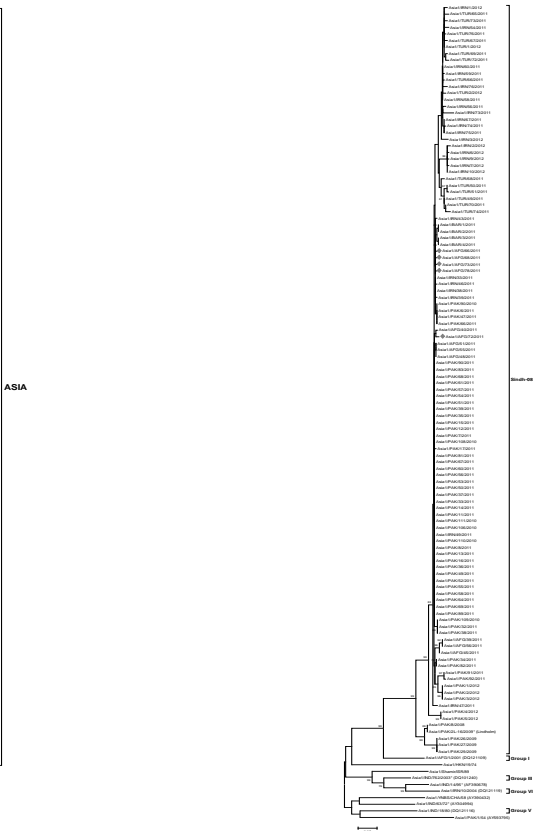
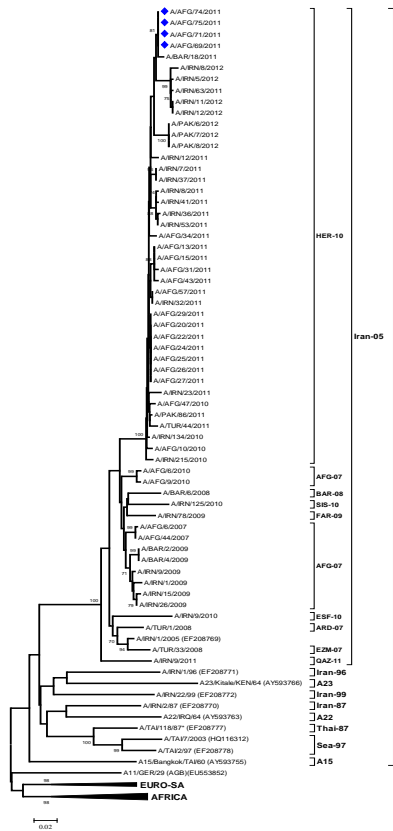
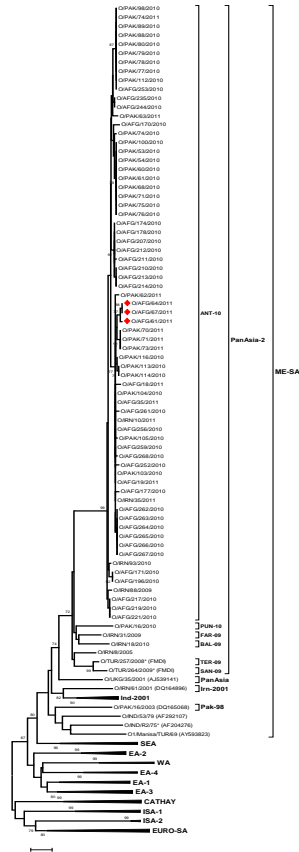
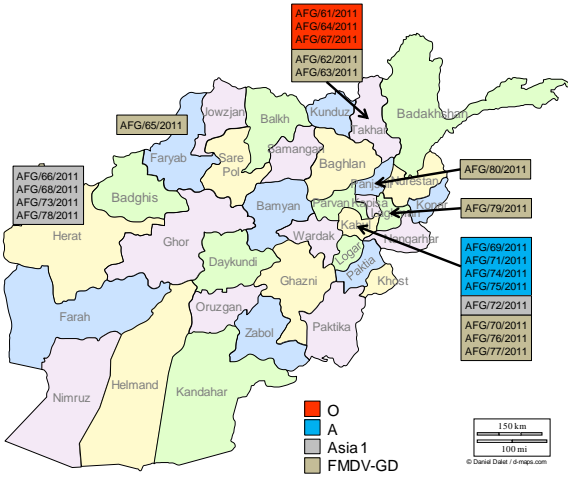
No. of samples: 20

O/ME-SA/PanAsia-2<sup>ANT-10</sup>: 3

A/ASIA/Iran-05<sup>HER-10</sup>: 4

Asia 1/ASIA/Sindh-08: 5

FMDV-GD: 8





**Bahrain**

WRLFMD/2012/00016

Date received: 30/03/2012

No. of samples: 16

O/ME-SA/PanAsia-2<sup>ANT-10</sup>: 2

SAT2/IV/Ken-09: 4

FMDV-GD: 2

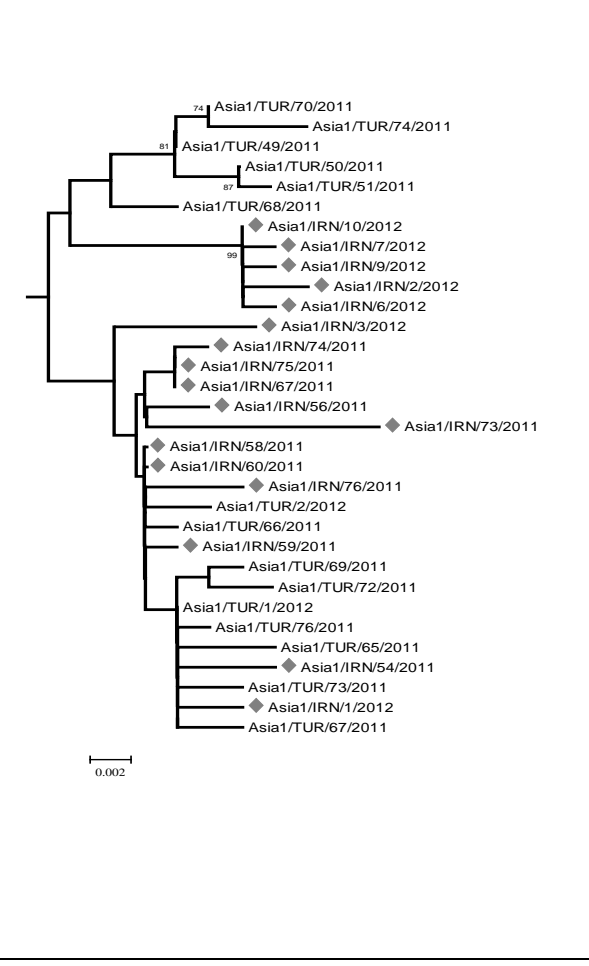
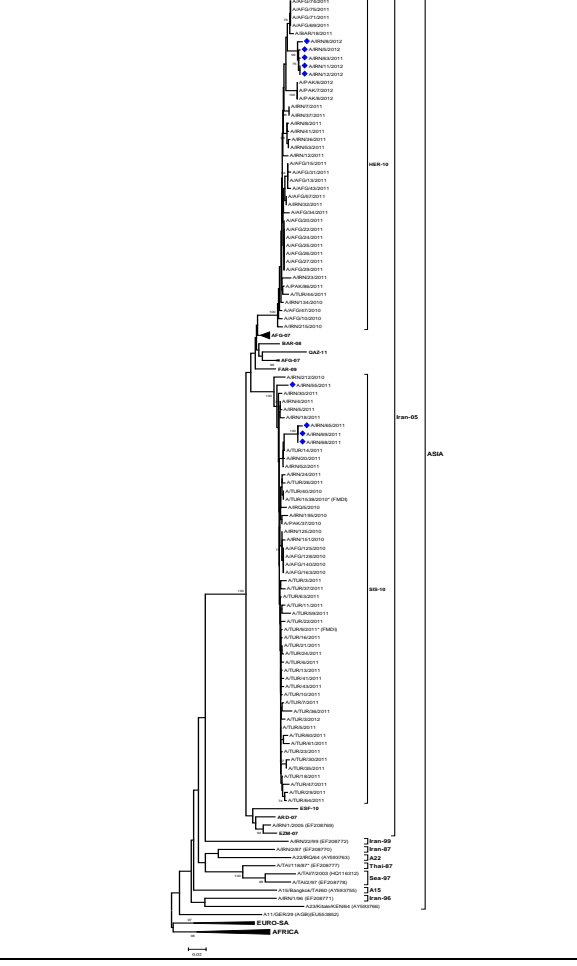
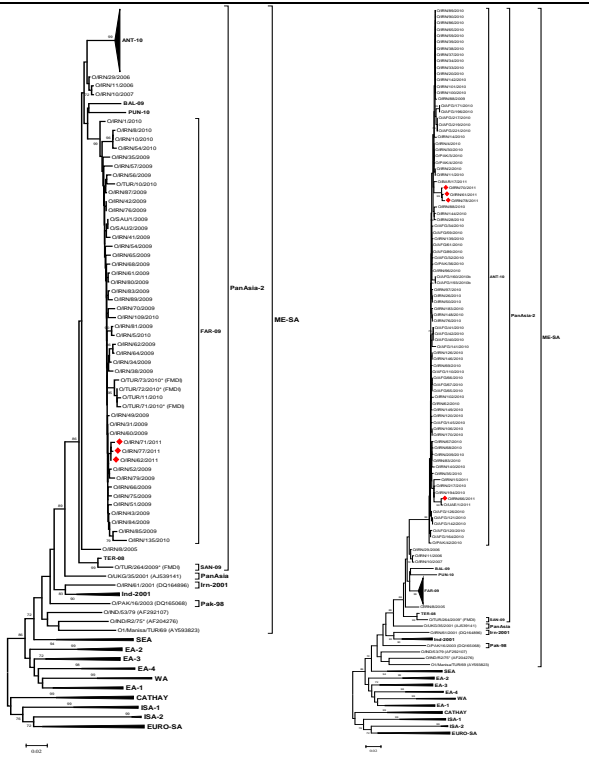
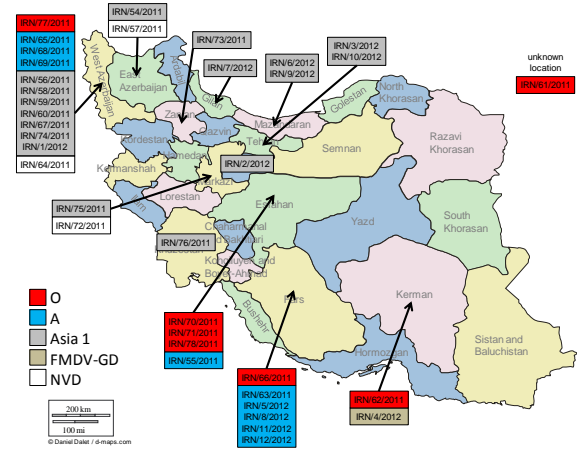
NVD: 8

(samples from animals held in quarantine)



**Iran**

WRLFMD/2012/00012  
 Date received: 24/02/2012  
 No. of samples: 37  
 O/ME-SA/ PanAsia-2<sup>ANT-10</sup>: 4  
 O/ME-SA/ PanAsia-2<sup>FAR-09</sup>: 3  
 A/ASIA/Iran/05<sup>HER-10</sup>: 5  
 A/ASIA/Iran/05<sup>SIS-10</sup>: 4  
 Asia 1/ASIA/Sindh-08: 17  
 FMDV-GD: 1  
 NVD: 3



**Japan**

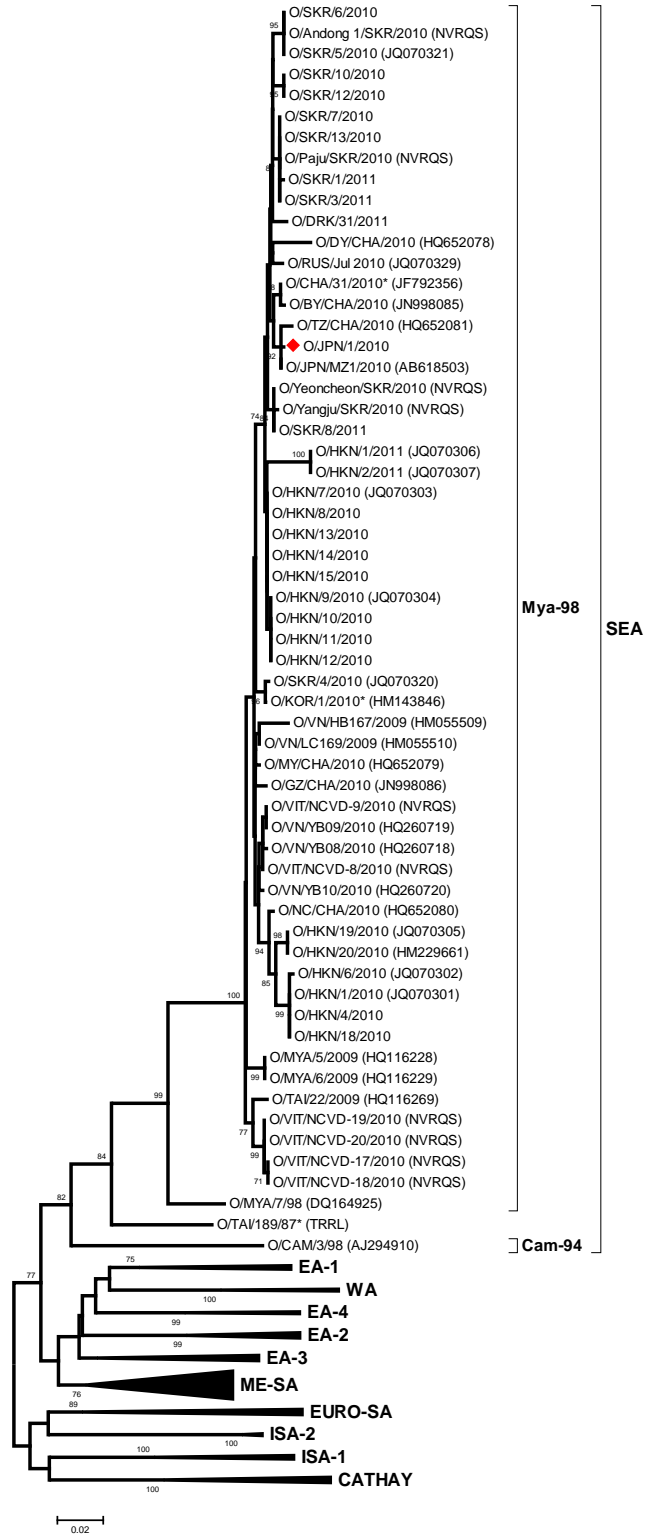
WRLFMD/2012/00003

Date received: 18/01/2012

No. of samples: 1

O/SEA/Mya-98: 1

(isolate from 2010 sent for complete genome sequencing)



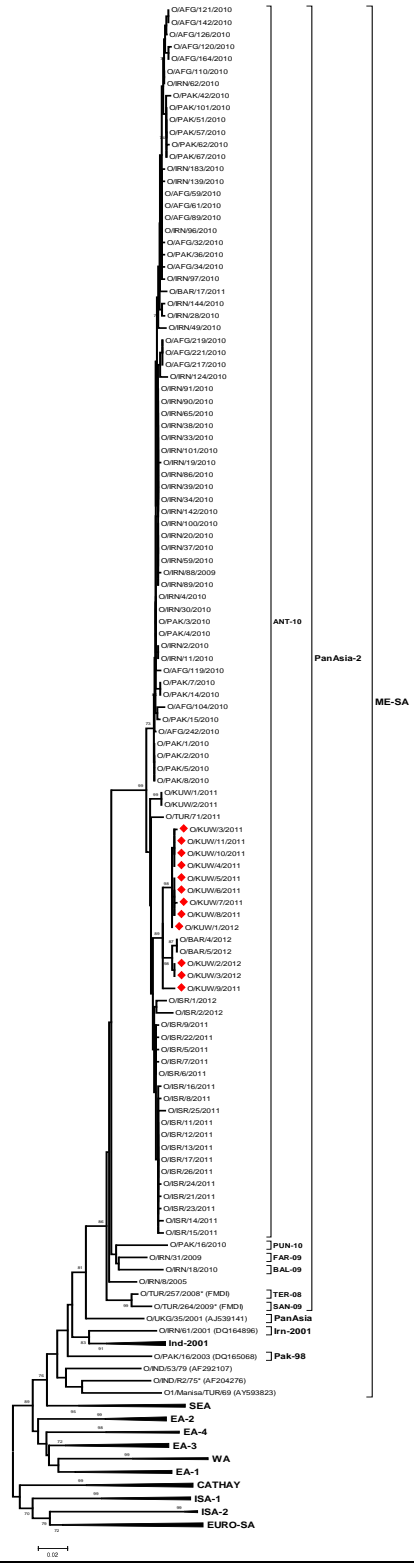
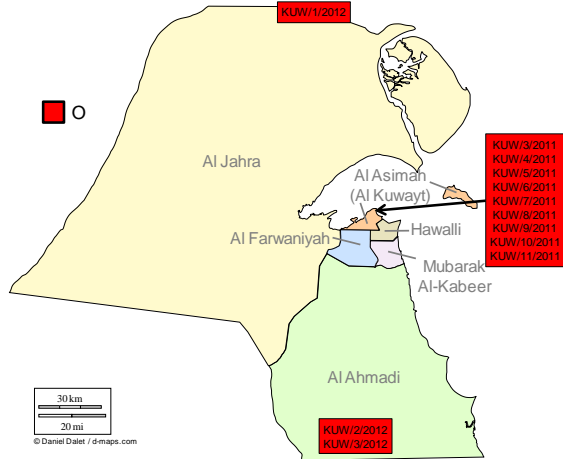
**Kuwait**

WRLFMD/2012/00013

Date received: 13/03/2012

No. of samples: 12

O/ME-SA/ PanAsia-2<sup>ANT-10</sup>: 12



**Pakistan**

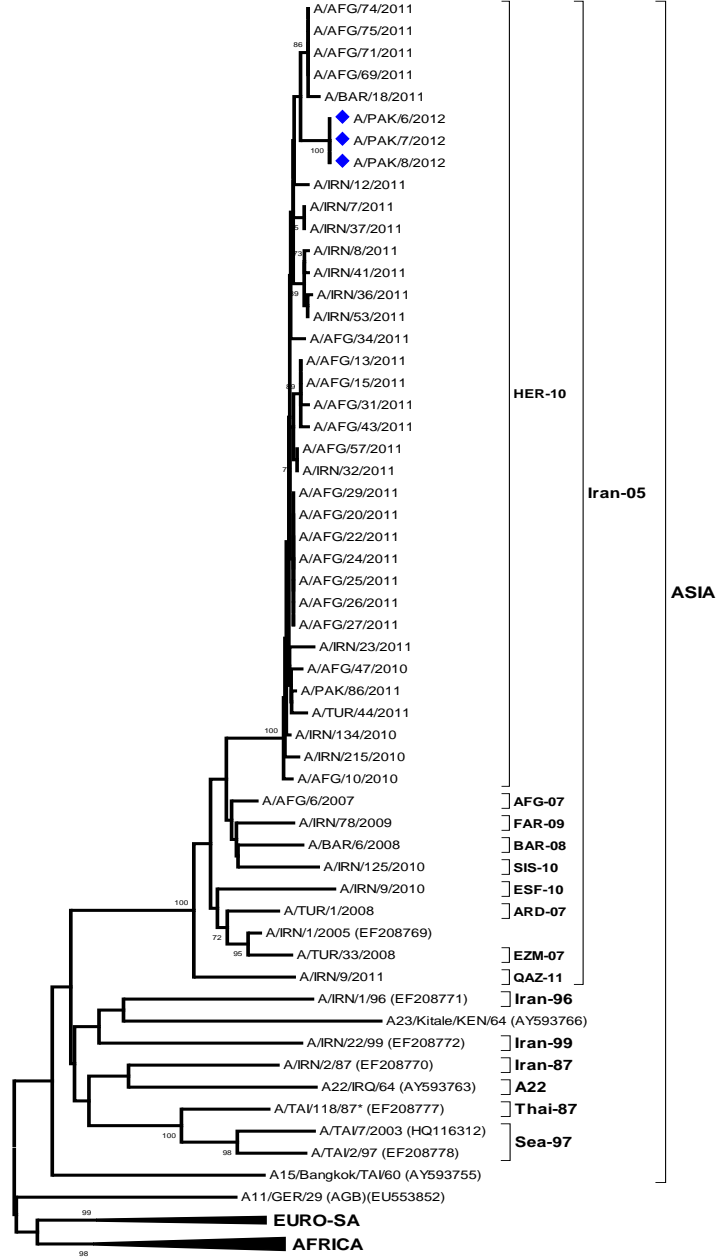
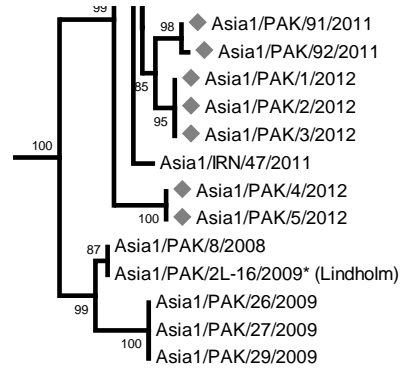
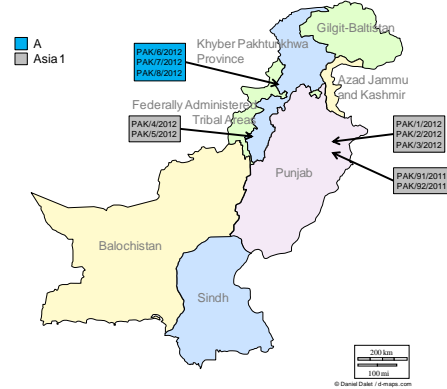
WRLFMD/2012/00008

Date received: 16/02/2012

No. of samples: 10

A/ASIA/Iran-05<sup>HER-10</sup>: 3

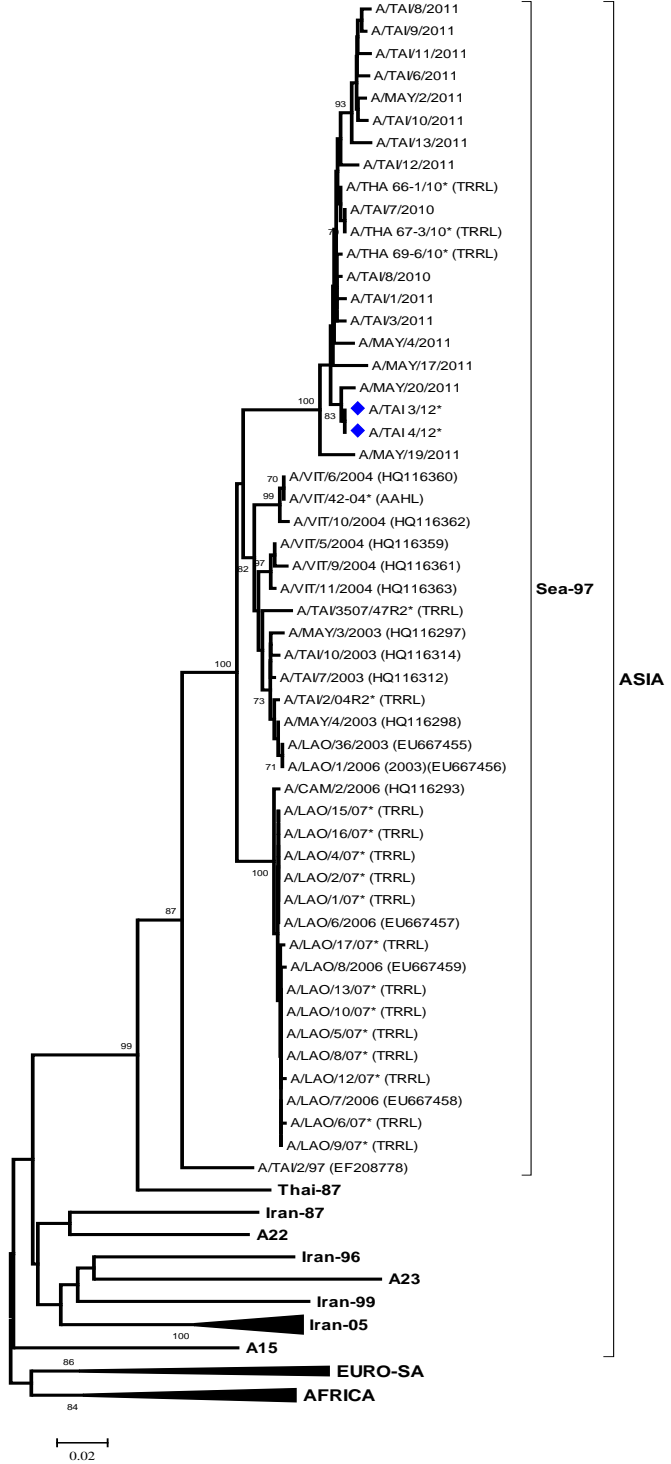
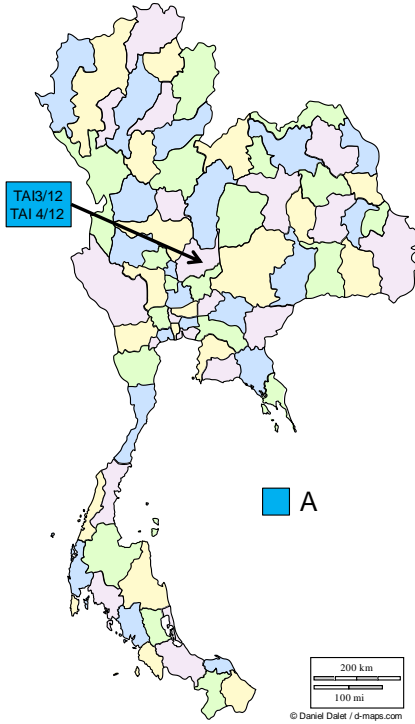
Asia 1/ASIA/Sindh-08: 7



0.02

**Thailand**

WRLMEG/2012/00004  
 VP1 sequences received from the RRL,  
 Pakchong.  
 Date received: 22/03/2012  
 No. of sequences: 2  
 A/ASIA/Sea-97: 2



### Turkey

WRLFMD/2012/00007

Date received: 02/02/2012

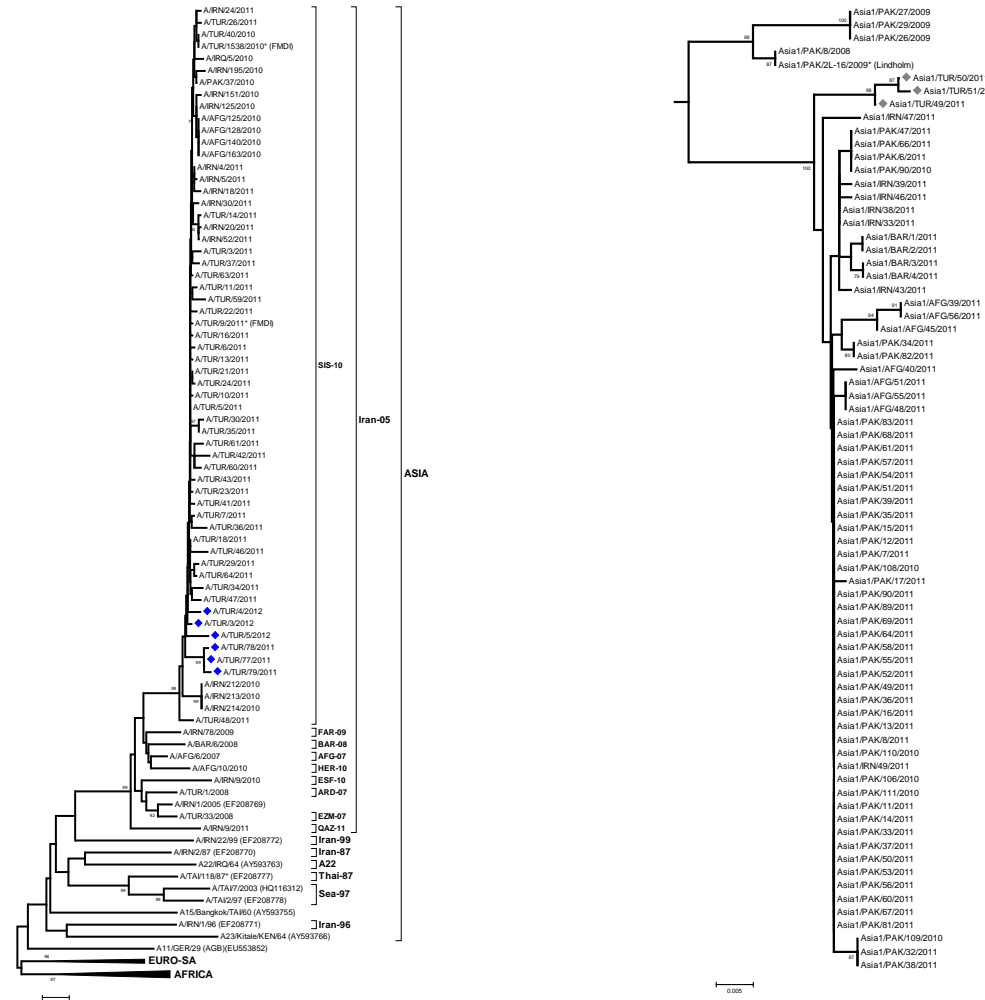
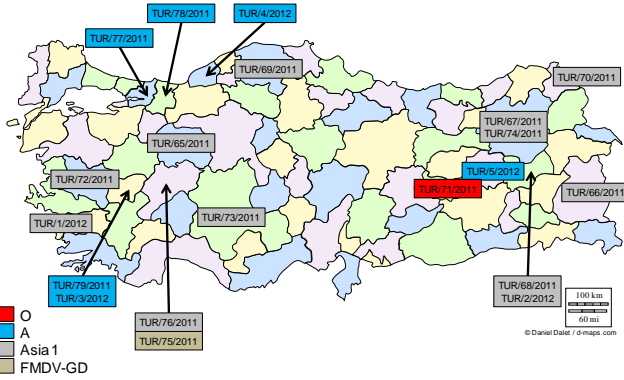
No. of samples: 20

O/ME-SA/ PanAsia-2<sup>ANT-10</sup>: 1

A/ASIA/Iran/05<sup>SIS-10</sup>: 6

Asia 1/ASIA/Sindh-08: 12

FMDV-GD: 1



**United Arab Emirates**

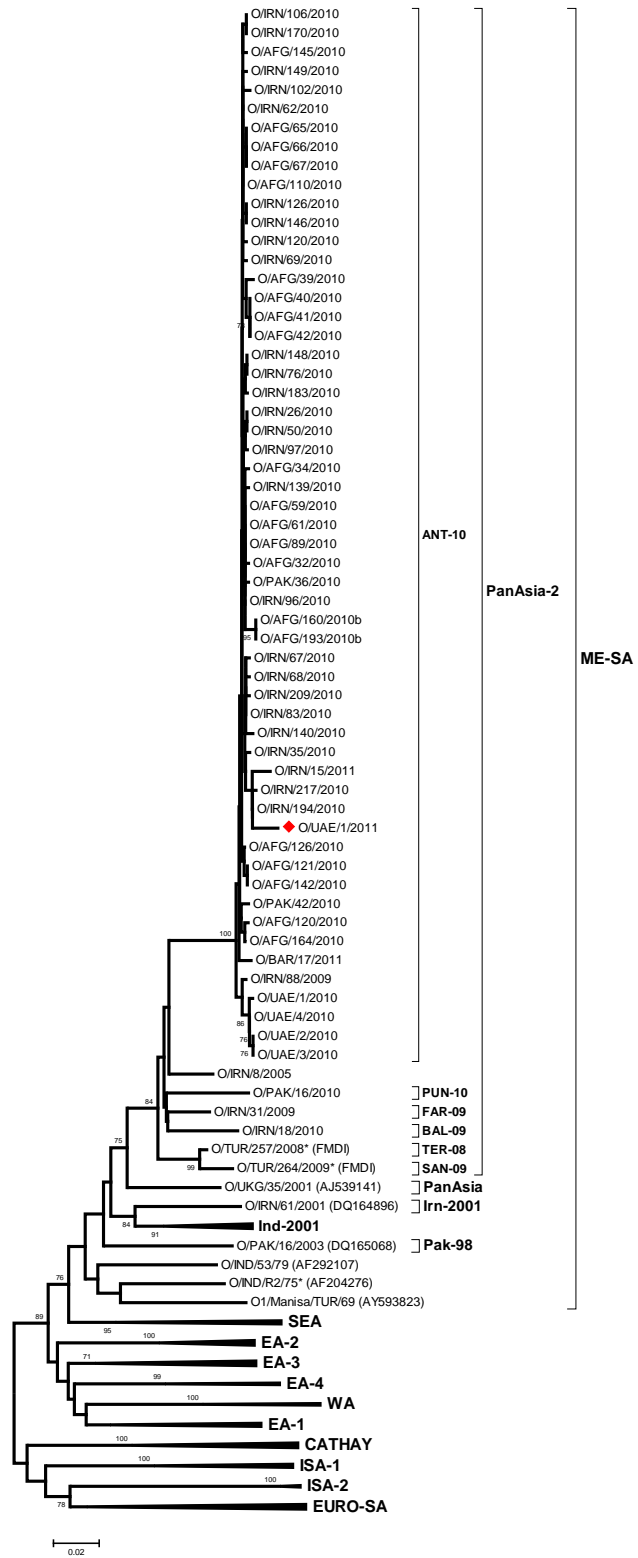
WRLFMD/2012/00004

Date received: 20/01/2012

No. of samples: 1

O/ME-SA/ PanAsia-2<sup>ANT-10</sup>: 1

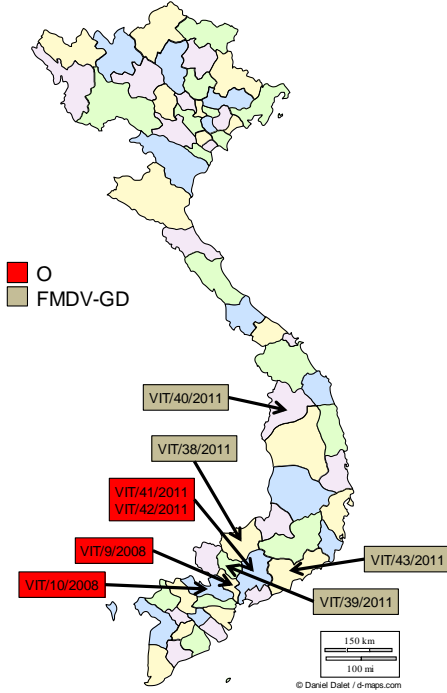
(no location provided)





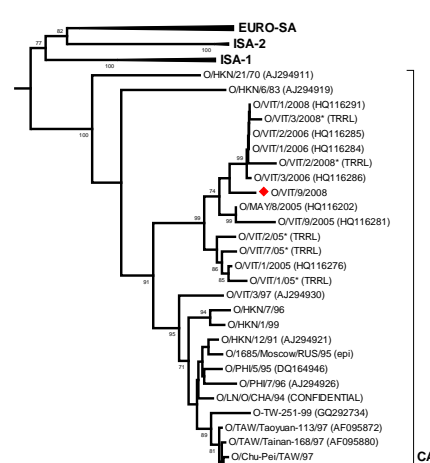
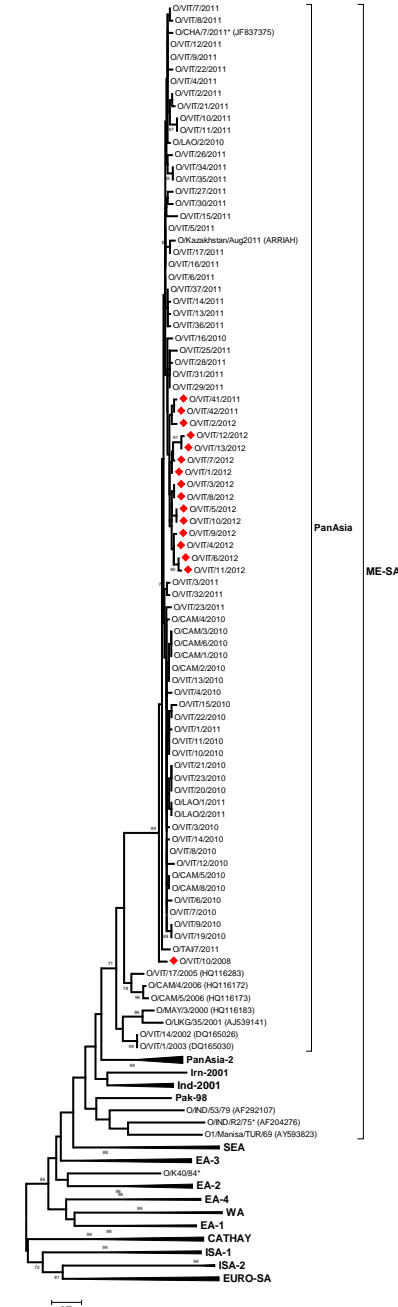
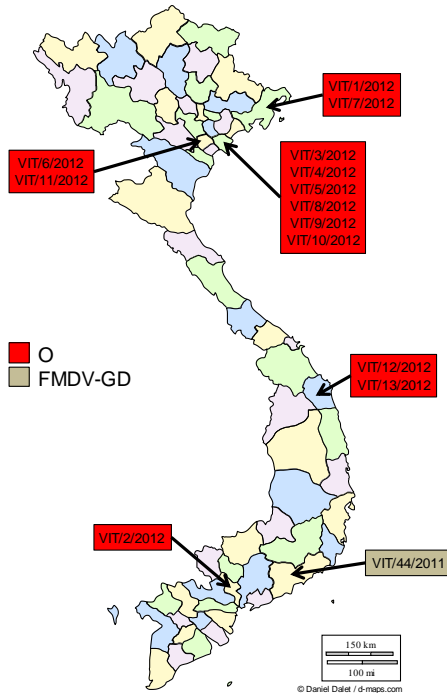
**Vietnam**

WRLFMD/2012/00001  
 Date received: 03/01/2012  
 No. of samples: 8  
 O/ME-SA/PanAsia: 3  
 O/CATHAY: 1  
 FMDV-GD: 4



**Vietnam**

WRLFMD/2012/00015  
 Date received: 28/03/2012  
 No. of samples: 14  
 O/ME-SA/PanAsia: 13  
 FMDV-GD: 1





**Ethiopia**

WRLFMD/2012/00006

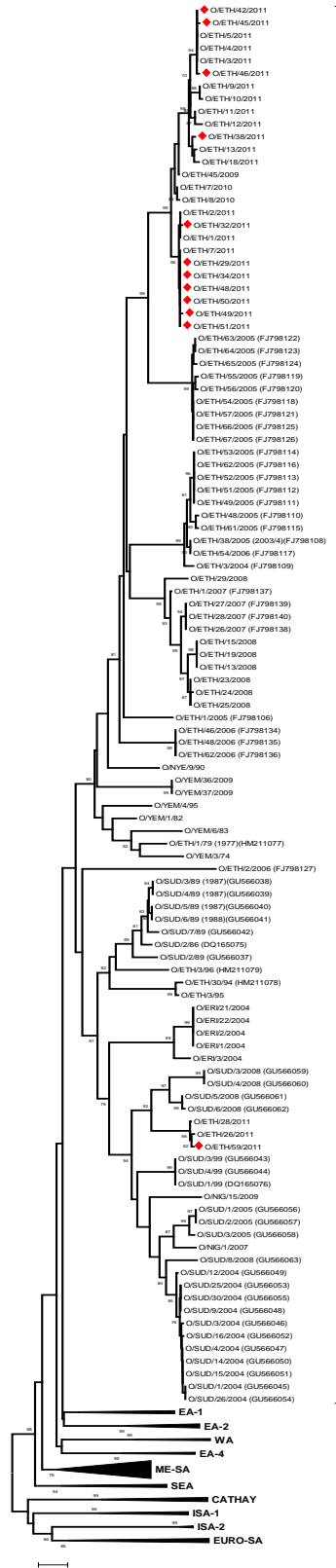
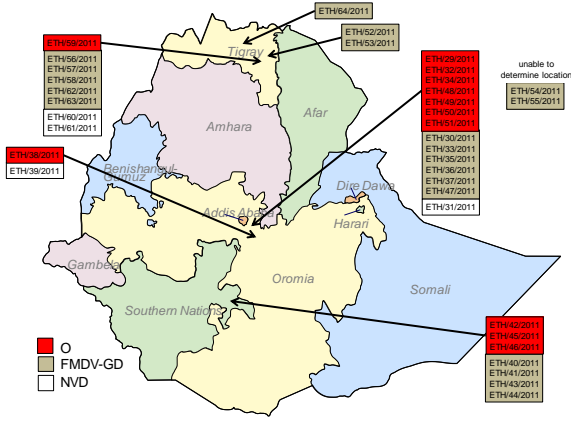
Date received: 03/02/2012

No. of samples: 40

O/EA-3: 16

FMDV-GD: 20

NVD: 4



EA-3

**Libya**

WRLFMD/2012/00005

Date received: 31/01/2012

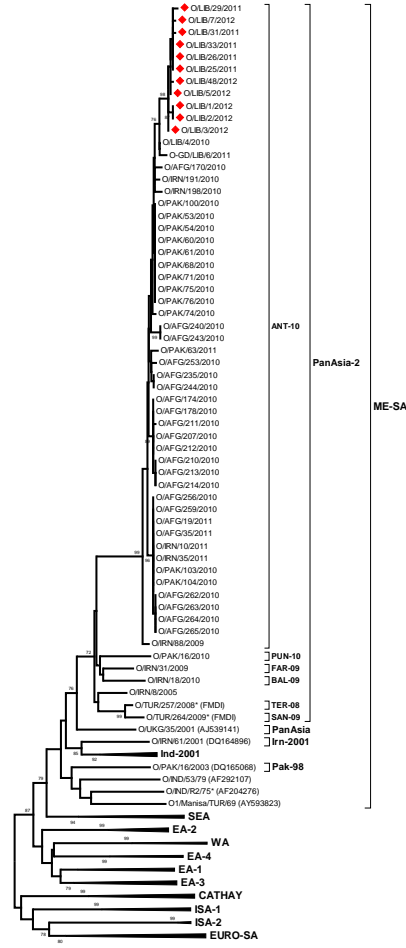
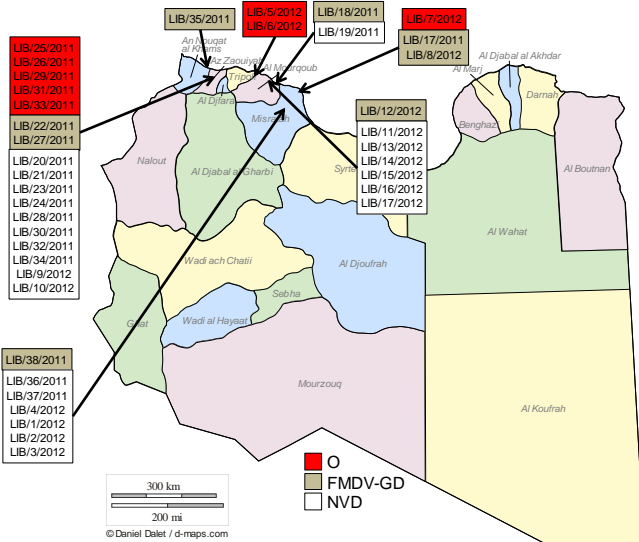
No. of samples: 39

O/ME-SA/ PanAsia-2<sup>ANT-10</sup>: 11\*

FMDV-GD: 8

NVD: 20

\*, no virus isolated in cell culture for 2 samples



**Libya**

WRLFMD/2012/00010

Date received: 27/02/2012

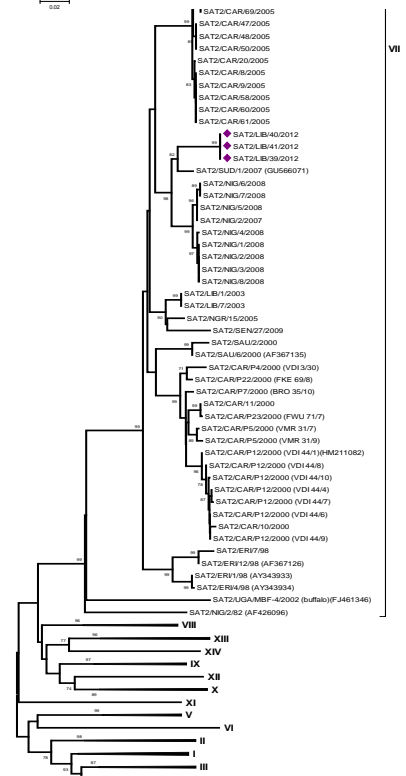
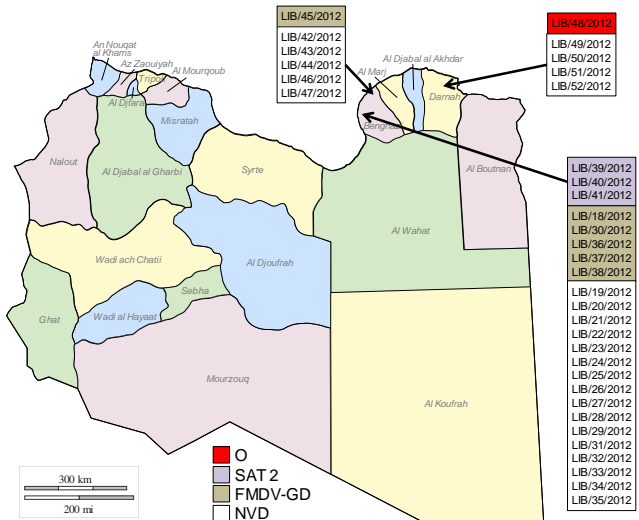
No. of samples: 35

O/ME-SA/ PanAsia-2<sup>ANT-10</sup>: 1

SAT2/VII/Lib-12: 3

FMDV-GD: 6

NVD: 25



**Tanzania**

WRLFMD/2012/00002

Date received: 13/01/2012

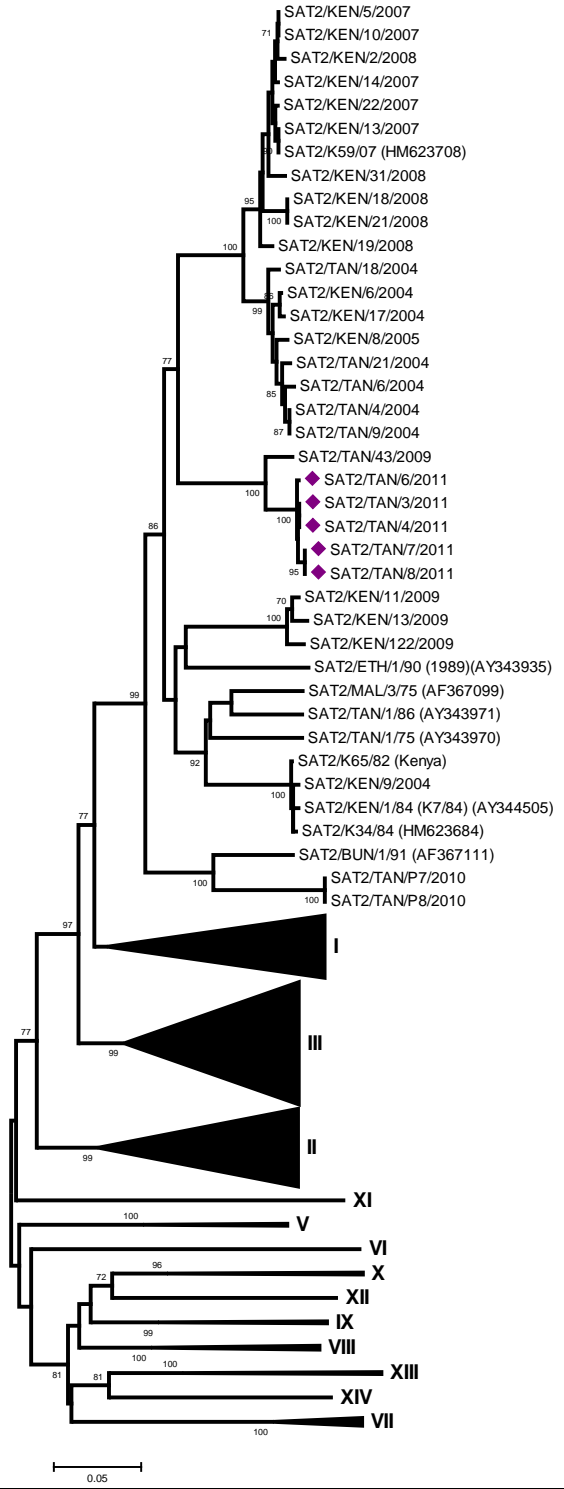
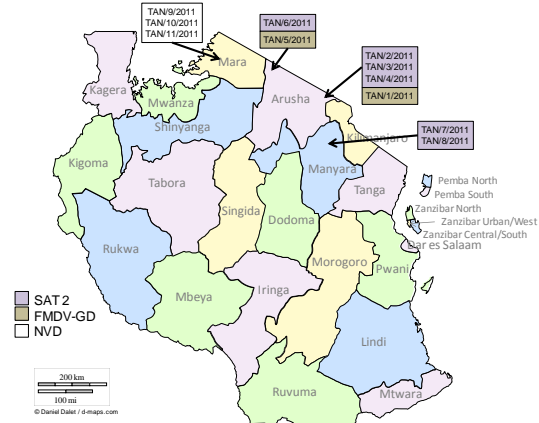
No. of samples: 11

SAT 2/IV: 6\*

FMDV-GD: 2

NVD: 3

\*, no virus isolated in cell cultures for one sample.



IV

**Zambia**

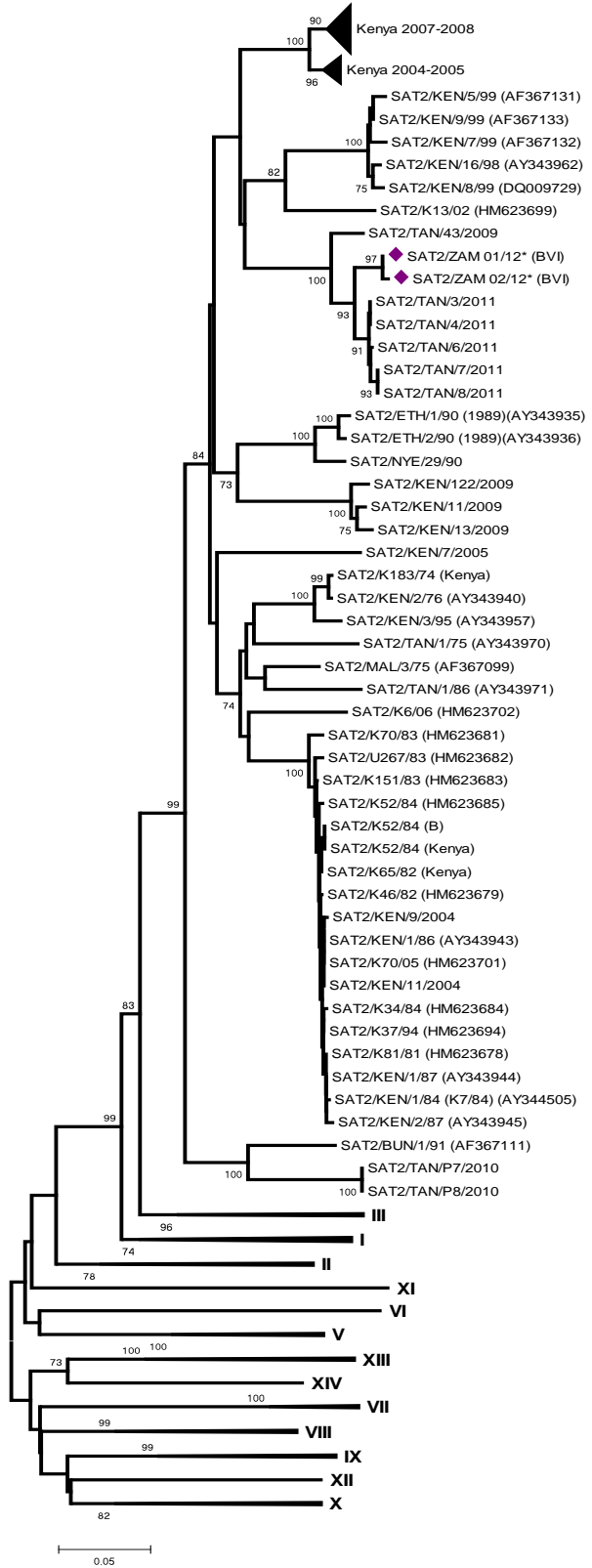
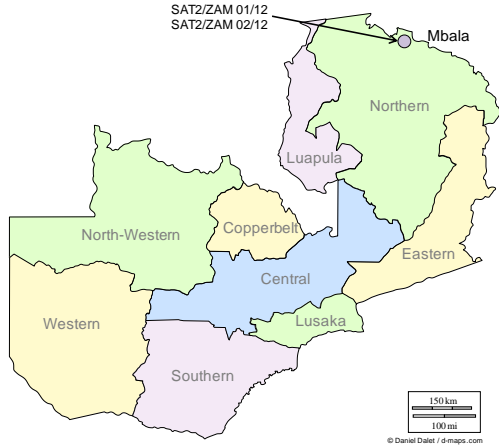
WRLMEG/2012/00005

Partial VP1 sequence received from the BVI

Date received: 05/04/2012

No. of sequences: 2

SAT 2/IV: 2



IV

## Vaccine matching

Eleven FMDV type O isolates (See Table C, Type O for details) from Turkey, Kuwait, Ethiopia, Hong Kong Special Administrative Region of the People's Republic of China and Democratic Republic of Congo collected in 2010 and 2011 were analysed antigenically by the two dimensional virus neutralisation test (2dmVNT). All isolates from Kuwait and Turkey were antigenically matched with the testing vaccine strains O 3039 and O TUR 07, respectively. Isolates from Ethiopia and Democratic Republic of Congo were all closely matched with O 4625 and O TUR 5/09 vaccine strains. In addition, O ETH 1/2011, O ETH 7/2011 and O COD 3/2010 showed a close match with O Campos and O Manisa (Table C).

Eight FMDV type A viruses (see table C, Type A for details) from Turkey, Malaysia, Democratic Republic of Congo and Bahrain collected in 2011 were analysed antigenically by the two dimensional virus neutralisation test (2dmVNT). All isolates showed antigenic match with the A TUR 06 vaccine strain. Two isolates from Turkey, Malaysia and Democratic Republic of Congo were also matched with A<sub>22</sub> Iraq (Table C).

Two FMDV type SAT 2 viruses (see table C, Type SAT 2 for details) from Libya showed no antigenic matching with either SAT 2 Zim or SAT 2 Eritrea vaccine strains. However, two SAT2 viruses from Egypt both gave a close match with SAT 2 Eritrea vaccine strain but also a poor to no match with SAT 2 Zim (Table C).

## Annex 1.

**TABLE A: Clinical sample diagnostics made by the WRL between January-March 2012**

Country	WRL for FMD Sample Identification	Animal	Date of Collection	Results		
				VI/ELISA	RT-PCR	Final report
AFGHANISTAN	AFG 61/2011	CATTLE	07-Apr-11	O	POS	O
	AFG 62/2011	CATTLE	07-Apr-11	NEG	POS	FMDV GD
	AFG 63/2011	CATTLE	08-Apr-11	NEG	POS	FMDV GD
	AFG 64/2011	CATTLE	17-Apr-11	O	POS	O
	AFG 65/2011	CATTLE	09-May-11	NEG	POS	FMDV GD
	AFG 66/2011	CATTLE	28-May-11	ASIA-1	POS	ASIA-1
	AFG 67/2011	CATTLE	29-May-11	O	POS	O
	AFG 68/2011	CATTLE	29-May-11	ASIA-1	POS	ASIA-1
	AFG 69/2011	CATTLE	30-May-11	A	POS	A
	AFG 70/2011	CATTLE	30-May-11	NEG	POS	FMDV GD
	AFG 71/2011	CATTLE	30-May-11	A	POS	A
	AFG 72/2011	CATTLE	30-May-11	ASIA-1	POS	ASIA-1
	AFG 73/2011	CATTLE	30-May-11	ASIA-1	POS	ASIA-1
	AFG 74/2011	CATTLE	30-May-11	A	POS	A
	AFG 75/2011	CATTLE	30-May-11	A	POS	A
	AFG 76/2011	CATTLE	31-May-11	NEG	POS	FMDV GD
	AFG 77/2011	CATTLE	31-May-11	NEG	POS	FMDV GD
	AFG 78/2011	CATTLE	31-May-11	ASIA-1	POS	ASIA-1
	AFG 79/2011	CATTLE	14-Jun-11	NEG	POS	FMDV GD
	AFG 80/2011	CATTLE	16-Aug-11	NEG	POS	FMDV GD
BAHRAIN	BAR 1/2012	CATTLE	05/03/2012	NOT TESTED	NEG	NVD
	BAR 2/2012	CATTLE	05/03/2012	NOT TESTED	NEG	NVD
	BAR 3/2012	CATTLE	05/03/2012	NOT TESTED	NEG	NVD
	BAR 4/2012	CATTLE	05/03/2012	O	NEG	O
	BAR 5/2012	CATTLE	05/03/2012	O	POS	O
	BAR 6/2012	CATTLE	05/03/2012	NOT TESTED	NEG	NVD
	BAR 7/2012	CATTLE	05/03/2012	NEG	NEG	NVD

	BAR 8/2012	CATTLE	05/03/2012	NOT TESTED	NEG	NVD
	BAR 9/2012	CATTLE	06/03/2012	NOT TESTED	POS	FMDV GD
	BAR 10/2012	CATTLE	06/03/2012	SAT 2	POS	SAT 2
	BAR 11/2012	CATTLE	13/03/2012	NEG	POS	FMDV GD
	BAR 12/2012	CATTLE	20/03/2012	SAT 2	POS	SAT 2
	BAR 13/2012	CATTLE	21/03/2012	SAT 2	NEG	SAT 2
	BAR 14/2012	CATTLE	21/03/2012	NOT TESTED	NEG	NVD
	BAR 15/2012	CATTLE	21/03/2012	NOT TESTED	NEG	NVD
	BAR 16/2012	CATTLE	26/03/2012	SAT 2	POS	SAT 2
EGYPT	EGY 1/2010	NOT KNOWN	14-Oct-10	A	POS	A
	EGY 2/2010	NOT KNOWN	15-Oct-10	A	POS	A
	EGY 3/2010	NOT KNOWN	15-Oct-10	A	POS	A
	EGY 1/2011	NOT KNOWN	06-Jan-11	NOT TESTED	POS	FMDV GD
	EGY 2/2011	NOT KNOWN	09-Jan-11	A	POS	A
	EGY 3/2011	NOT KNOWN	13-Feb-11	NEG	POS	FMDV GD
	EGY 4/2011	NOT KNOWN	21-Feb-11	NEG	POS	FMDV GD
	EGY 5/2011	NOT KNOWN	11-Apr-11	A	POS	A
	EGY 6/2011	NOT KNOWN	21-Apr-11	O	POS	O
	EGY 7/2011	NOT KNOWN	21-Apr-11	O	POS	O
	EGY 8/2011	NOT KNOWN	19-May-11	A	POS	A
	EGY 9/2011	NOT KNOWN	14-Jun-11	A	POS	A
	EGY 10/2011	NOT KNOWN	13-Jul-11	O	POS	O
	EGY 1/2012	NOT KNOWN	08-Feb-12	A	POS	A
	EGY 2/2012	NOT KNOWN	17-Feb-12	SAT 2	POS	SAT 2
	EGY 3/2012	NOT KNOWN	18-Feb-12	SAT 2	POS	SAT 2
	EGY 4/2012	NOT KNOWN	27-Feb-12	SAT 2	POS	SAT 2
	EGY 5/2012	NOT KNOWN	27-Feb-12	SAT 2	POS	SAT 2
	EGY 6/2012	NOT KNOWN	27-Feb-12	SAT 2	POS	SAT 2
	EGY 7/2012	NOT KNOWN	28-Feb-12	NOT TESTED	POS	FMDV GD
	EGY 8/2012	NOT KNOWN	29-Feb-12	NOT TESTED	POS	FMDV GD
	EGY 9/2012	NOT KNOWN	29-Feb-12	SAT 2	POS	SAT 2
	EGY 10/2012	NOT KNOWN	29-Feb-12	SAT 2	POS	SAT 2
	EGY 11/2012	NOT KNOWN	29-Feb-12	SAT 2	POS	SAT 2
	EGY 12/2012	NOT KNOWN	29-Feb-12	NOT TESTED	NEG	NVD
	EGY 13/2012	NOT KNOWN	01-Mar-12	SAT 2	POS	SAT 2
	EGY 14/2012	NOT KNOWN	03-Mar-12	SAT 2	POS	SAT 2
	EGY 15/2012	NOT KNOWN	04-Mar-12	SAT 2	POS	SAT 2
ETHIOPIA	ETH 29/2011	PIG	15-Jul-11	O	POS	O
	ETH 30/2011	PIG	15-Jul-11	NOT TESTED	POS	FMDV GD
	ETH 31/2011	PIG	29-Jul-11	NOT TESTED	NEG	NVD
	ETH 32/2011	PIG	29-Jul-11	O	POS	O
	ETH 33/2011	PIG	29-Jul-11	NOT TESTED	POS	FMDV GD
	ETH 34/2011	CATTLE	29-Jul-11	O	POS	O
	ETH 35/2011	CATTLE	19-Sep-11	NOT TESTED	POS	FMDV GD
	ETH 36/2011	CATTLE	19-Sep-11	NOT TESTED	POS	FMDV GD
	ETH 37/2011	CATTLE	19-Sep-11	NOT TESTED	POS	FMDV GD
	ETH 38/2011	CATTLE	04-Oct-11	O	POS	O
	ETH 39/2011	CATTLE	04-Oct-11	NOT TESTED	NEG	NVD
	ETH 40/2011	CATTLE	08-Oct-11	NOT TESTED	POS	FMDV GD
	ETH 41/2011	CATTLE	08-Oct-11	NOT TESTED	POS	FMDV GD
	ETH 42/2011	CATTLE	08-Oct-11	O	POS	O
	ETH 43/2011	CATTLE	08-Oct-11	NOT TESTED	POS	FMDV GD
	ETH 44/2011	CATTLE	08-Oct-11	NOT TESTED	POS	FMDV GD



	ETH 45/2011	CATTLE	08-Oct-11	O	POS	O
	ETH 46/2011	CATTLE	08-Oct-11	O	POS	O
	ETH 47/2011	CATTLE	14-Oct-11	NOT TESTED	POS	FMDV GD
	ETH 48/2011	CATTLE	14-Oct-11	O	POS	O
	ETH 49/2011	CATTLE	14-Oct-11	O	POS	O
	ETH 50/2011	CATTLE	14-Oct-11	O	POS	O
	ETH 51/2011	CATTLE	14-Oct-11	O	POS	O
	ETH 52/2011	CATTLE	25-Nov-11	NOT TESTED	POS	FMDV GD
	ETH 53/2011	CATTLE	25-Nov-11	NOT TESTED	POS	FMDV GD
	ETH 54/2011	CATTLE	25-Nov-11	NOT TESTED	POS	FMDV GD
	ETH 55/2011	CATTLE	25-Nov-11	NOT TESTED	POS	FMDV GD
	ETH 56/2011	CATTLE	29-Nov-11	NOT TESTED	POS	FMDV GD
	ETH 57/2011	CATTLE	29-Nov-11	NOT TESTED	POS	FMDV GD
	ETH 58/2011	CATTLE	29-Nov-11	NOT TESTED	POS	FMDV GD
	ETH 59/2011	CATTLE	29-Nov-11	O	POS	O
	ETH 60/2011	CATTLE	29-Nov-11	NOT TESTED	NEG	NVD
	ETH 61/2011	CATTLE	01-Dec-11	NOT TESTED	NEG	NVD
	ETH 62/2011	CATTLE	01-Dec-11	NOT TESTED	POS	FMDV GD
	ETH 63/2011	CATTLE	01-Dec-11	NOT TESTED	POS	FMDV GD
	ETH 64/2011	CATTLE	01-Dec-11	NOT TESTED	POS	FMDV GD
IRAN	IRN 54/2011	CATTLE	19-Sep-11	ASIA-1	POS	ASIA-1
	IRN 55/2011	CATTLE	08-Oct-11	A	POS	A
	IRN 56/2011	CATTLE	13-Oct-11	ASIA-1	POS	ASIA-1
	IRN 57/2011	CATTLE	15-Oct-11	NEG	NEG	NVD
	IRN 58/2011	CATTLE	29-Oct-11	ASIA-1	POS	ASIA-1
	IRN 59/2011	CATTLE	31-Oct-11	ASIA-1	POS	ASIA-1
	IRN 60/2011	CATTLE	08-Nov-11	ASIA-1	POS	ASIA-1
	IRN 61/2011	CATTLE	09-Nov-11	O	POS	O
	IRN 62/2011	CATTLE	12-Nov-11	O	POS	O
	IRN 63/2011	CATTLE	13-Nov-11	A	POS	A
	IRN 64/2011	CATTLE	18-Nov-11	NEG	NEG	NVD
	IRN 65/2011	CATTLE	18-Nov-11	A	POS	A
	IRN 66/2011	SHEEP	19-Nov-11	O	POS	O
	IRN 67/2011	CATTLE	20-Nov-11	ASIA-1	POS	ASIA-1
	IRN 68/2011	CATTLE	21-Nov-11	A	POS	A
	IRN 69/2011	CATTLE	21-Nov-11	A	POS	A
	IRN 70/2011	SHEEP	23-Nov-11	O	POS	O
	IRN 71/2011	CATTLE	28-Nov-11	O	POS	O
	IRN 72/2011	SHEEP	11-Dec-11	NEG	NEG	NVD
	IRN 73/2011	CATTLE	25-Dec-11	ASIA-1	POS	ASIA-1
	IRN 74/2011	CATTLE	25-Dec-11	ASIA-1	POS	ASIA-1
	IRN 75/2011	CATTLE	26-Dec-11	ASIA-1	POS	ASIA-1
	IRN 76/2011	CATTLE	27-Dec-11	ASIA-1	POS	ASIA-1
	IRN 77/2011	CATTLE	27-Dec-11	O	POS	O
	IRN 78/2011	SHEEP	31-Dec-11	O	POS	O
	IRN 1/2012	CATTLE	01-Jan-12	ASIA-1	POS	ASIA-1
	IRN 2/2012	CATTLE	02-Jan-12	ASIA-1	POS	ASIA-1
	IRN 3/2012	CATTLE	03-Jan-12	ASIA-1	POS	ASIA-1
	IRN 4/2012	CATTLE	03-Jan-12	NEG	POS	FMDV GD
	IRN 5/2012	CATTLE	03-Jan-12	A	POS	A
	IRN 6/2012	CATTLE	10-Jan-12	ASIA-1	POS	ASIA-1
	IRN 7/2012	CATTLE	12-Jan-12	ASIA-1	POS	ASIA-1
	IRN 8/2012	CATTLE	12-Jan-12	A	POS	A
	IRN 9/2012	CATTLE	14-Jan-12	ASIA-1	POS	ASIA-1

	IRN 10/2012	CATTLE	17-Jan-12	ASIA-1	POS	ASIA-1
	IRN 11/2012	CATTLE	26-Jan-12	A	POS	A
	IRN 12/2012	CATTLE	26-Jan-12	A	POS	A
JAPAN	JPN 1/2010	IB-RS2-3	17-Apr-10	O	POS	O
KUWAIT	KUW 3/2011	CATTLE	20-Dec-11	O	POS	O
	KUW 4/2011	CATTLE	20-Dec-11	O	POS	O
	KUW 5/2011	CATTLE	20-Dec-11	O	POS	O
	KUW 6/2011	CATTLE	20-Dec-11	O	POS	O
	KUW 7/2011	CATTLE	20-Dec-11	O	POS	O
	KUW 8/2011	CATTLE	20-Dec-11	O	POS	O
	KUW 9/2011	CATTLE	27-Dec-11	O	POS	O
	KUW 10/2011	CATTLE	27-Dec-11	O	POS	O
	KUW 11/2011	CATTLE	27-Dec-11	O	POS	O
	KUW 1/2012	CATTLE	07-Jan-12	O	POS	O
	KUW 2/2012	CATTLE	09-Feb-12	O	POS	O
	KUW 3/2012	CATTLE	09-Feb-12	O	POS	O
LIBYA	LIB 17/2011	CATTLE	18-Dec-11	NVD	POS	FMDV GD
	LIB 18/2011	CATTLE	20-Dec-11	NVD	POS	FMDV GD
	LIB 19/2011	SHEEP	21-Dec-11	NVD	NEG	NVD
	LIB 20/2011	CATTLE	21-Dec-11	NVD	NEG	NVD
	LIB 21/2011	CATTLE	21-Dec-11	NVD	NEG	NVD
	LIB 22/2011	CATTLE	21-Dec-11	NVD	POS	FMDV GD
	LIB 23/2011	CATTLE	21-Dec-11	NVD	NEG	NVD
	LIB 24/2011	CATTLE	21-Dec-11	NVD	NEG	NVD
	LIB 25/2011	CATTLE	21-Dec-11	O	POS	O
	LIB 26/2011	CATTLE	21-Dec-11	O	POS	O
	LIB 27/2011	CATTLE	21-Dec-11	NVD	POS	FMDV GD
	LIB 28/2011	CATTLE	24-Dec-11	NVD	NEG	NVD
	LIB 29/2011	CATTLE	24-Dec-11	O	POS	O
	LIB 30/2011	CATTLE	25-Dec-11	NVD	NEG	NVD
	LIB 31/2011	CATTLE	25-Dec-11	O	POS	O
	LIB 32/2011	CATTLE	25-Dec-11	NVD	NEG	NVD
	LIB 33/2011	CATTLE	25-Dec-11	O	POS	O
	LIB 34/2011	CATTLE	27-Dec-11	NVD	NEG	NVD
	LIB 35/2011	CATTLE	29-Dec-11	NVD	POS	FMDV GD
	LIB 36/2011	SHEEP	30-Dec-11	NVD	NEG	NVD
	LIB 37/2011	SHEEP	30-Dec-11	NVD	NEG	NVD
	LIB 38/2011	SHEEP	30-Dec-11	NVD	POS	FMDV GD
	LIB 1/2012	CATTLE	01-Jan-12	O	POS	O
	LIB 2/2012	CATTLE	01-Jan-12	O	POS	O
	LIB 3/2012	CATTLE	01-Jan-12	O	POS	O
	LIB 4/2012	CATTLE	01-Jan-12	NVD	NEG	NVD
	LIB 5/2012	CATTLE	12-Jan-12	O	POS	O
	LIB 6/2012	CATTLE	12-Jan-12	O	POS	O
	LIB 7/2012	SHEEP	17-Jan-12	O	POS	O
	LIB 8/2012	SHEEP	17-Jan-12	NVD	POS	FMDV GD
	LIB 9/2012	CATTLE	18-Jan-12	NVD	NEG	NVD
	LIB 10/2012	CATTLE	18-Jan-12	NVD	NEG	NVD
	LIB 11/2012	CATTLE	18-Jan-12	NVD	NEG	NVD
	LIB 12/2012	CATTLE	18-Jan-12	NVD	POS	FMDV GD
	LIB 13/2012	CATTLE	18-Jan-12	NVD	NEG	NVD
	LIB 14/2012	CATTLE	18-Jan-12	NVD	NEG	NVD

	LIB 15/2012	CATTLE	18-Jan-12	NVD	NEG	NVD
	LIB 16/2012	CATTLE	18-Jan-12	NVD	NEG	NVD
	LIB 17/2012	SHEEP	18-Jan-12	NVD	NEG	NVD
	LIB 18/2012	CATTLE	15-Feb-12	NEG	POS	FMDV GD
	LIB 19/2012	CATTLE	15-Feb-12	NOT TESTED	NEG	NVD
	LIB 20/2012	CATTLE	15-Feb-12	NOT TESTED	NEG	NVD
	LIB 21/2012	CATTLE	15-Feb-12	NOT TESTED	NEG	NVD
	LIB 22/2012	CATTLE	15-Feb-12	NOT TESTED	NEG	NVD
	LIB 23/2012	CATTLE	15-Feb-12	NOT TESTED	NEG	NVD
	LIB 24/2012	CATTLE	16-Feb-12	NOT TESTED	NEG	NVD
	LIB 25/2012	CATTLE	16-Feb-12	NOT TESTED	NEG	NVD
	LIB 26/2012	SHEEP	16-Feb-12	NOT TESTED	NEG	NVD
	LIB 27/2012	SHEEP	16-Feb-12	NOT TESTED	NEG	NVD
	LIB 28/2012	SHEEP	16-Feb-12	NOT TESTED	NEG	NVD
	LIB 29/2012	SHEEP	16-Feb-12	NOT TESTED	NEG	NVD
	LIB 30/2012	SHEEP	16-Feb-12	NEG	POS	FMDV GD
	LIB 31/2012	SHEEP	16-Feb-12	NOT TESTED	NEG	NVD
	LIB 32/2012	SHEEP	16-Feb-12	NOT TESTED	NEG	NVD
	LIB 33/2012	SHEEP	16-Feb-12	NOT TESTED	NEG	NVD
	LIB 34/2012	SHEEP	16-Feb-12	NOT TESTED	NEG	NVD
	LIB 35/2012	SHEEP	16-Feb-12	NOT TESTED	NEG	NVD
	LIB 36/2012	CATTLE	16-Feb-12	NOT TESTED	POS	FMDV GD
	LIB 37/2012	CATTLE	16-Feb-12	NEG	POS	FMDV GD
	LIB 38/2012	CATTLE	16-Feb-12	NEG	POS	FMDV GD
	LIB 39/2012	CATTLE	16-Feb-12	SAT 2	POS	SAT 2
	LIB 40/2012	CATTLE	16-Feb-12	SAT 2	POS	SAT 2
	LIB 41/2012	CATTLE	16-Feb-12	SAT 2	POS	SAT 2
	LIB 42/2012	SHEEP	17-Feb-12	NOT TESTED	NEG	NVD
	LIB 43/2012	SHEEP	17-Feb-12	NOT TESTED	NEG	NVD
	LIB 44/2012	SHEEP	17-Feb-12	NOT TESTED	NEG	NVD
	LIB 45/2012	CATTLE	17-Feb-12	NEG	POS	FMDV GD
	LIB 46/2012	CATTLE	17-Feb-12	NOT TESTED	NEG	NVD
	LIB 47/2012	CATTLE	17-Feb-12	NOT TESTED	NEG	NVD
	LIB 48/2012	CATTLE	18-Feb-12	O	POS	O
	LIB 49/2012	SHEEP	18-Feb-12	NEG	NEG	NVD
	LIB 50/2012	SHEEP	18-Feb-12	NOT TESTED	NEG	NVD
	LIB 51/2012	SHEEP	18-Feb-12	NOT TESTED	NEG	NVD
	LIB 52/2012	CATTLE	18-Feb-12	NEG	NEG	NVD
PAKISTAN	PAK 91/2011	BUFFALO	23-Dec-11	ASIA-1	POS	ASIA-1
	PAK 92/2011	BUFFALO	23-Dec-11	ASIA-1	POS	ASIA-1
	PAK 1/2012	CATTLE	08-Jan-12	ASIA-1	POS	ASIA-1
	PAK 2/2012	BUFFALO	08-Jan-12	ASIA-1	POS	ASIA-1
	PAK 3/2012	BUFFALO	08-Jan-12	ASIA-1	POS	ASIA-1
	PAK 4/2012	CATTLE	14-Jan-12	ASIA-1	POS	ASIA-1
	PAK 5/2012	CATTLE	14-Jan-12	ASIA-1	POS	ASIA-1
	PAK 6/2012	CATTLE	16-Jan-12	A	POS	A
	PAK 7/2012	CATTLE	16-Jan-12	A	POS	A
	PAK 8/2012	CATTLE	16-Jan-12	A	POS	A
TANZANIA	TAN 7/2011	CATTLE	20-Aug-11	SAT 2	POS	SAT 2
	TAN 8/2011	CATTLE	20-Aug-11	SAT 2	POS	SAT 2
	TAN 9/2011	CATTLE	27-Nov-11	NVD	NEG	NVD
	TAN 10/2011	CATTLE	27-Nov-11	NVD	NEG	NVD
	TAN 11/2011	NOT KNOWN	27-Nov-11	NVD	NEG	NVD

TURKEY	TUR 65/2011	CATTLE	20-Oct-11	ASIA-1	POS	ASIA-1
	TUR 66/2011	CATTLE	17-Nov-11	ASIA-1	POS	ASIA-1
	TUR 67/2011	CATTLE	24-Nov-11	ASIA-1	POS	ASIA-1
	TUR 68/2011	CATTLE	01-Dec-11	ASIA-1	POS	ASIA-1
	TUR 69/2011	CATTLE	06-Dec-11	ASIA-1	POS	ASIA-1
	TUR 70/2011	CATTLE	07-Dec-11	ASIA-1	POS	ASIA-1
	TUR 71/2011	CATTLE	08-Dec-11	O	POS	O
	TUR 72/2011	CATTLE	12-Dec-11	ASIA-1	POS	ASIA-1
	TUR 73/2011	CATTLE	16-Dec-11	ASIA-1	POS	ASIA-1
	TUR 74/2011	CATTLE	19-Dec-11	ASIA-1	POS	ASIA-1
	TUR 75/2011	CATTLE	27-Dec-11	NEG	POS	FMDV GD
	TUR 76/2011	CATTLE	27-Dec-11	ASIA-1	POS	ASIA-1
	TUR 77/2011	CATTLE	27-Dec-11	A	POS	A
	TUR 78/2011	CATTLE	29-Dec-11	A	POS	A
	TUR 79/2011	CATTLE	29-Dec-11	A	POS	A
	TUR 1/2012	CATTLE	02-Jan-12	ASIA-1	POS	ASIA-1
	TUR 2/2012	CATTLE	05-Jan-12	ASIA-1	POS	ASIA-1
	TUR 3/2012	CATTLE	06-Jan-12	A	POS	A
	TUR 4/2012	CATTLE	10-Jan-12	A	POS	A
	TUR 5/2012	CATTLE	11-Jan-12	A	POS	A
UAE	UAE 1/2011	GOAT	23-Dec-11	O	POS	O
VIETNAM	VIT 9/2008	Pig	04-Feb-08	O	POS	O
	VIT 10/2008	Pig	18-Jul-08	O	POS	O
	VIT 38/2011	Pig	22-Feb-11	NVD	POS	FMDV GD
	VIT 39/2011	Pig	10-Mar-11	NVD	POS	FMDV GD
	VIT 40/2011	Buffalo	21-Mar-11	NVD	POS	FMDV GD
	VIT 41/2011	Pig	28-Sep-11	O	POS	O
	VIT 42/2011	Pig	28-Sep-11	O	POS	O
	VIT 43/2011	Pig	01-Dec-11	NVD	POS	FMDV GD
	VIT 44/2011	PIG	01-Dec-11	NOT TESTED	POS	FMDV GD
	VIT 1/2012	PIG	05-Jan-12	O	POS	O
	VIT 2/2012	PIG	16-Jan-12	O	POS	O
	VIT 3/2012	PIG	03-Feb-12	O	POS	O
	VIT 4/2012	PIG	04-Feb-12	O	POS	O
	VIT 5/2012	PIG	06-Feb-12	O	POS	O
	VIT 6/2012	PIG	22-Feb-12	O	POS	O
	VIT 7/2012	PIG	14-Mar-12	O	POS	O
	VIT 8/2012	PIG	14-Mar-12	O	POS	O
	VIT 9/2012	PIG	14-Mar-12	O	POS	O
	VIT 10/2012	PIG	14-Mar-12	O	POS	O
	VIT 11/2012	PIG	14-Mar-12	O	POS	O
	VIT 12/2012	PIG	24-Mar-12	O	POS	O
	VIT 13/2012	PIG	24-Mar-12	O	POS	O

TOTAL : 288

FMD(V)	foot-and-mouth disease (virus)
GD	genome detected
VI/ELISA	FMDV serotype identified following virus isolation in cell culture and antigen ELISA
RT-PCR	reverse transcription polymerase chain reaction on epithelial suspension for FMD (or SVD)
	viral genome
NVD	no foot-and-mouth disease, swine vesicular disease or vesicular stomatitis virus detected

**TABLE B: Summary of samples collected and received to IAH-Pirbright (January-March 2012)**

Country	No. of samples	Virus isolation in cell culture/ELISA							NVD	RT-PCR for FMDV (or SVDV) (where appropriate)	
		FMD virus serotypes								Positive	Negative
		O	A	C	SAT 1	SAT 2	SAT 3	Asia 1			
AFGHANISTAN	20	3	4	-	-	-	-	5	8	20	-
BAHRAIN	16	2	-	-	-	4	-	-	2	6	10
EGYPT	28	3	8	-	-	11	-	-	2	27	1
ETHIOPIA	36	12	-	-	-	-	-	-	-	32	4
IRAN	37	7	9	-	-	-	-	17	4	34	3
JAPAN	1	1	-	-	-	-	-	-	-	1	-
KUWAIT	12	12	-	-	-	-	-	-	-	12	-
LIBYA	74	12	-	-	-	3	-	-	12	29	45
PAKISTAN	10	-	3	-	-	-	-	7	-	10	-
TANZANIA	11	-	-	-	-	6	-	-	5	8	3
TURKEY	20	1	6	-	-	-	-	12	1	20	-
UNITED ARAB EMIRATES	1	1	-	-	-	-	-	-	-	1	-
VIETNAM, SOCIALIST REPUBLIC OF	22	17	-	-	-	-	-	-	-	22	-
<b>TOTAL</b>	<b>288</b>	<b>71</b>	<b>30</b>	<b>0</b>	<b>0</b>	<b>24</b>	<b>0</b>	<b>41</b>	<b>34</b>	<b>222</b>	<b>66</b>

VI/ELISA	FMD (or SVD) virus serotype identified following virus isolation in cell culture and antigen detection ELISA
FMD	foot-and-mouth disease
SVD	swine vesicular disease
NVD	no FMD, SVD or vesicular stomatitis virus detected
RT-PCR	reverse transcription polymerase chain reaction for FMD (or SVD) viral genome

**TABLE C: Antigenic characterisation of FMD field isolates by matching with vaccine strains by VNT from 1<sup>st</sup> JANUARY to 31<sup>st</sup> MARCH 2012****Type O:**

Vaccine matching studies for type O FMDV by VNT-WRL FMD							
WRL Sample Ref	O 3039	O 4625	O Campos	O Manisa	O Taw98	O Tur 5/09	O Tur 07
O Kuw 02/2011	M						
O Kuw 01/2011	M						
O Hkn 8/2011	M	N	N	N	M	N	
O Hkn 9/2011	M	N	N	N	M	M	
O Eth 1/2011		M	M	M		M	
O Eth 7/2011		M	M	M		M	
O Eth 13/2011		M	N	N		M	
O Eth 28/2011		M	M	N		M	
O Tur 25/2011							M
O Tur 33/2011							M
O Cod 3/2010		M	M	M		M	

## Type A:

Vaccine matching studies for type A FMDV by VNT-WRL FMD								
WRL Sample Ref	A Iran 2005	A22 Irq	A Sau95	A Tur06	A Ind 17/82	A May97	A Sau 41/91	A Eri 3/98
A TUR 64/11	N	N	N	M			N	
A TUR 78/11	M	M	N	M				
A TUR 3/12	M	M	N	M				
A May 2/11	M	M		M	N	N		
A May 20/11	M	M		M	N	N		
A Cod 2/11	M	M	N	M				M
A Cod 12/11	N	M	N	M				M
A Bar 18/11	N	N	N	M			N	N

## Type SAT 2:

Vaccine matching studies for type SAT2 FMDV by VNT-WRL FMD		
WRL Sample Ref	Sat2 Eri	Sat2 Zim
Sat2 Lib 40/2012	N	N
Sat2 Lib 41/2012	N	N
Sat2 Egy 6/2012	M	N
Sat2 Egy 9/2012	M	N

In the case of VNT:

**M:**  $r_1 \geq 0.3$ . Suggests that there is a close relationship between field isolate and vaccine strain. A potent vaccine containing the vaccine strain is likely to confer protection.

**N:**  $r_1 < 0.3$ . Suggests that the field isolate is so different from the vaccine strain that the vaccine is unlikely to protect

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## Annex 3. RECOMMENDATIONS FROM WRLFMD ON FMD VIRUS STRAINS TO BE INCLUDED IN FMDV ANTIGEN BANKS – March 2012

### High Priority

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

(not in order of importance)

### Medium Priority

A Eritrea  
 A Iran '96  
 SAT 2 Zimbabwe  
 A Iran 87 or A Saudi Arabia 23/86 (*or equivalent*)  
 SAT 1 South Africa  
 A Malaysia 97 (*or Thai equivalent such as A/NPT/TAI/86*)  
 A Argentina 2001  
 O Taiwan 97 (*pig-adapted strain or Philippine equivalent*)  
 A Iran '99

(not in order of importance)

### Low Priority

A15 Bangkok related strain  
 A87 Argentina related strain  
 C Noville  
 SAT 2 Kenya  
 SAT 1 Kenya  
 SAT 3 Zimbabwe  
 A Kenya

(not in order of importance)

\*New addition