

FMD WRL REPORT 2006

(FAO Rome Jan 2007)



FMD FAO World Reference Laboratory for FMD

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Talk Overview

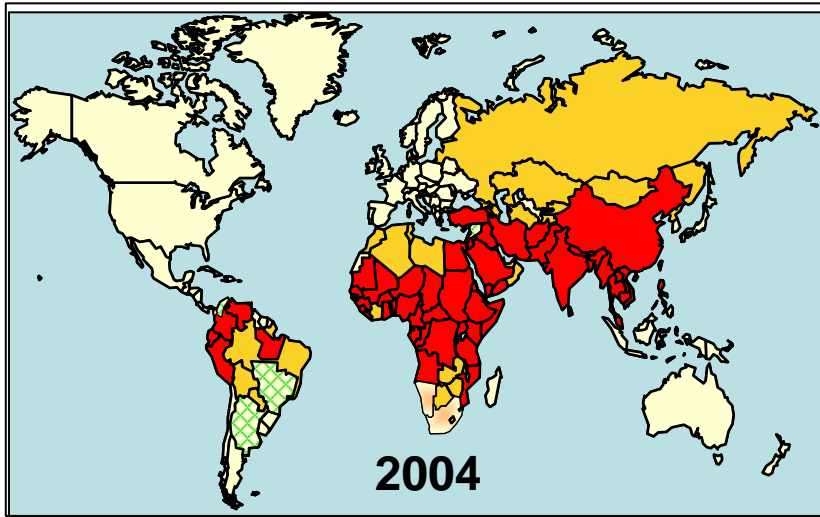
- Key events and world status overview
- Summary of testing at WRL
- Current vaccine recommendations
- Coordination and dissemination activities
- Conclusions on risk

Summary of key events

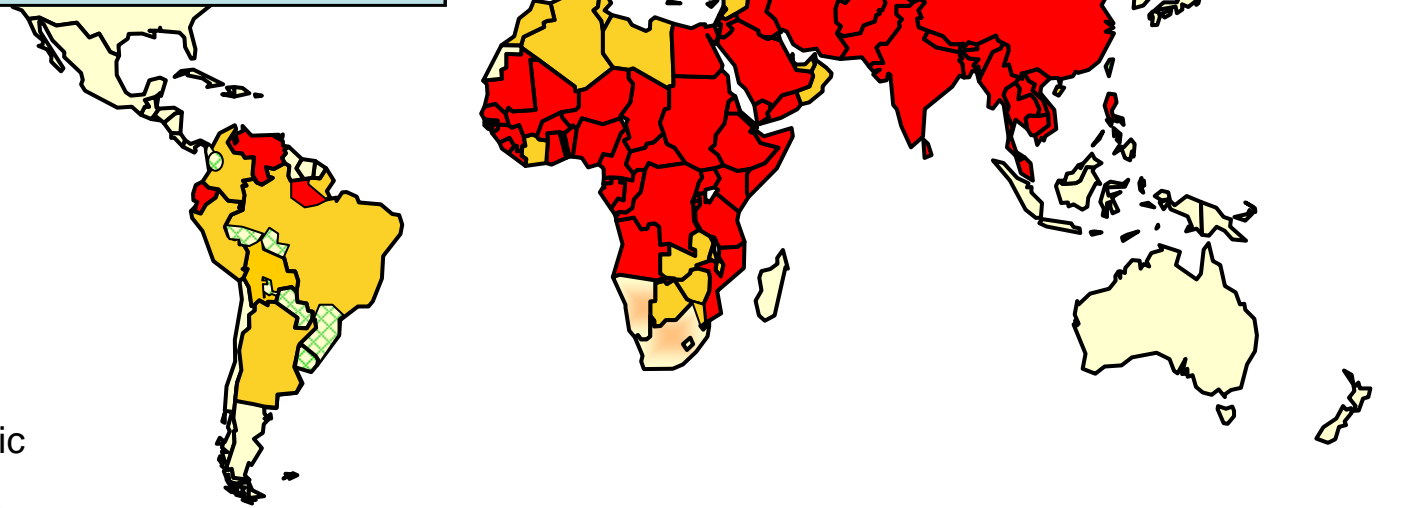
- Spread of A Iran 05 and O PanAsia in Middle East-South Asia
- Introduction of type A into Egypt
- Other hotspots in SE Asia and Africa
- Argentina/Brazil status changes
- Substantial vaccination programmes in South America, China and India






Conjectured Status of FMD

2006

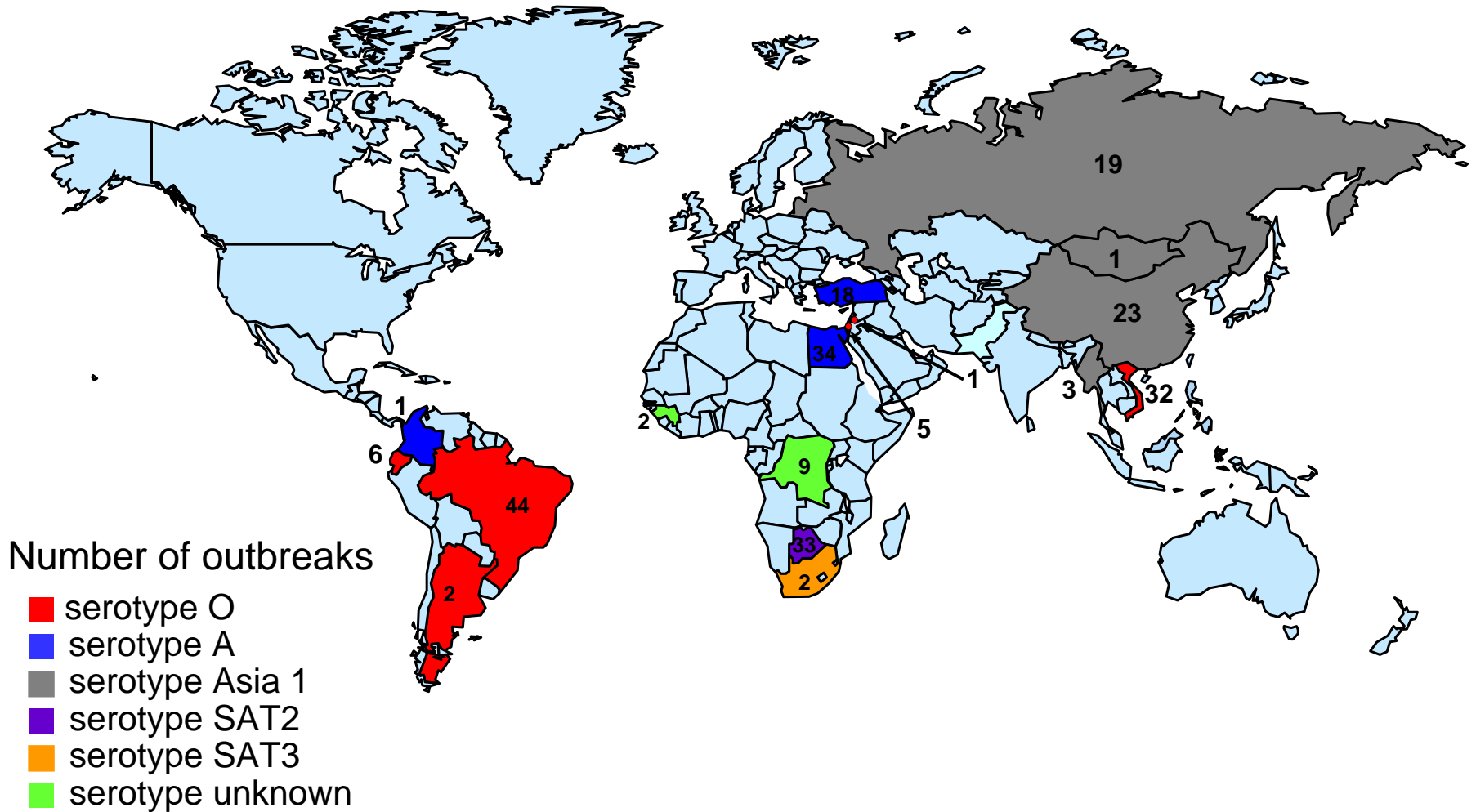


2004

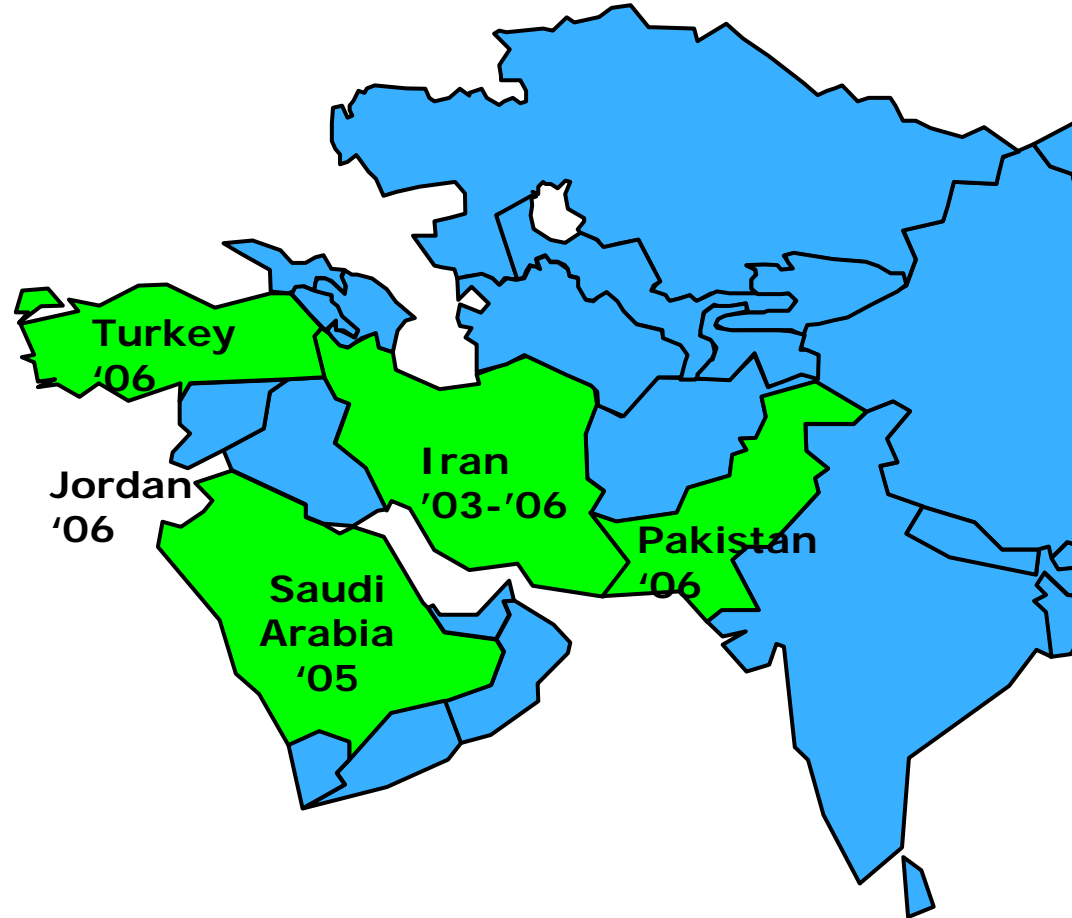


-  Endemic
-  Intermediate, sporadic
-  Free with vaccination
-  Free. Virus present in game parks
-  Free

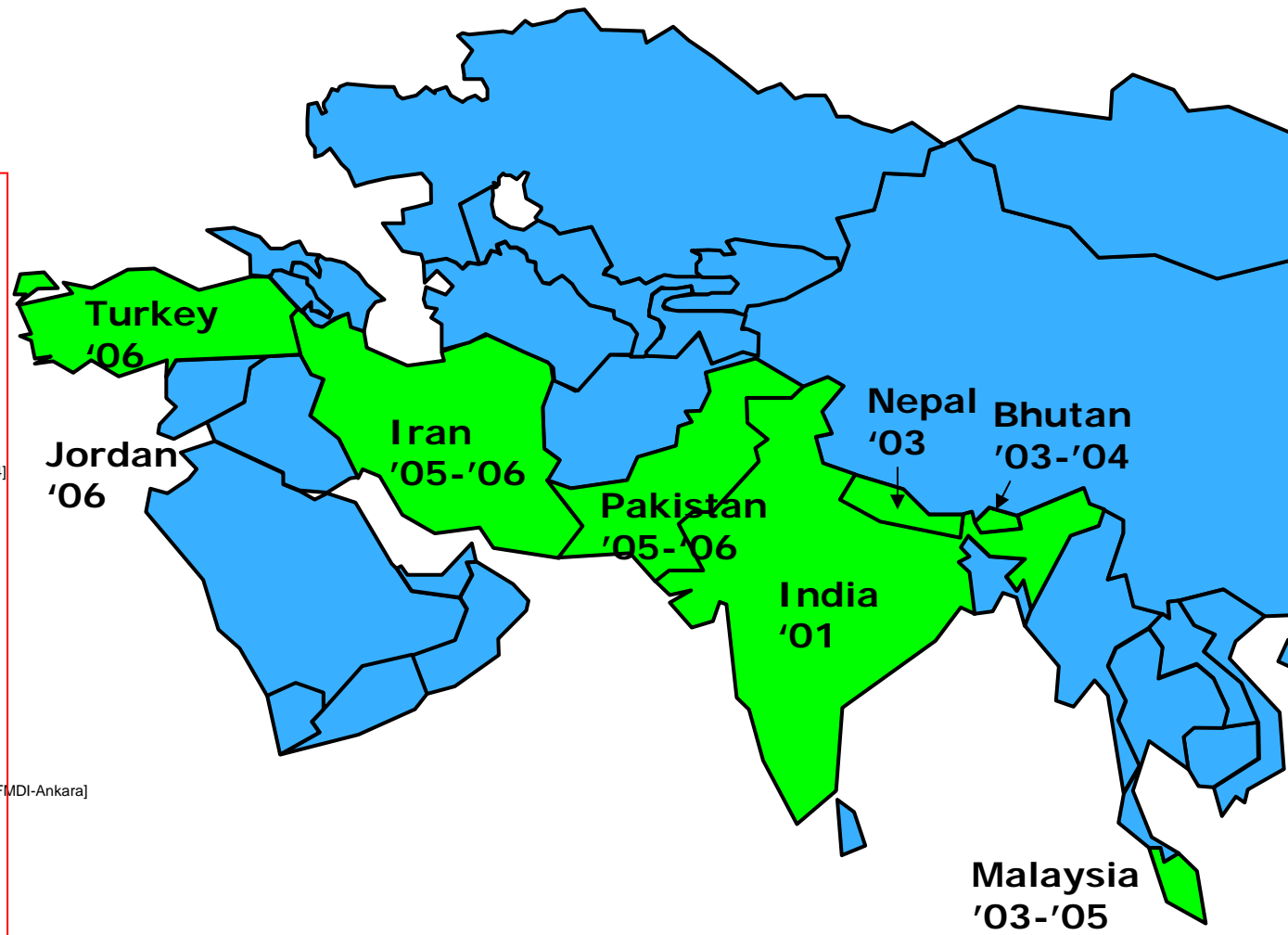
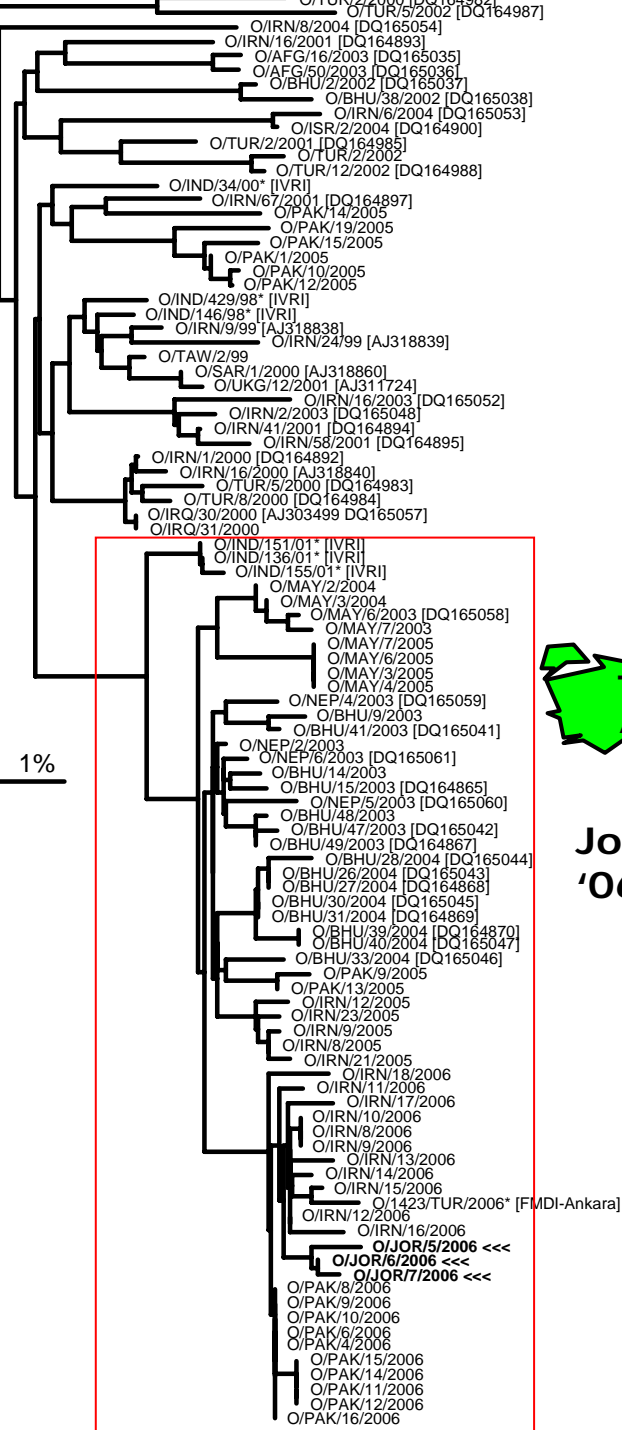
Changes in FMD situation in countries as reported to OIE in 2005-2006



Occurrence of "A Iran 05"



Occurrence of "O PanAsia variant"



VNT

	A22	A Eritrea
A Jor 3/2006	r0.47	r0.17
A Jor 4/2006	r0.66	r0.14
	O Manisa	
O Jor 5/2006	r0.32	
O Jor 6/2006	r0.23	

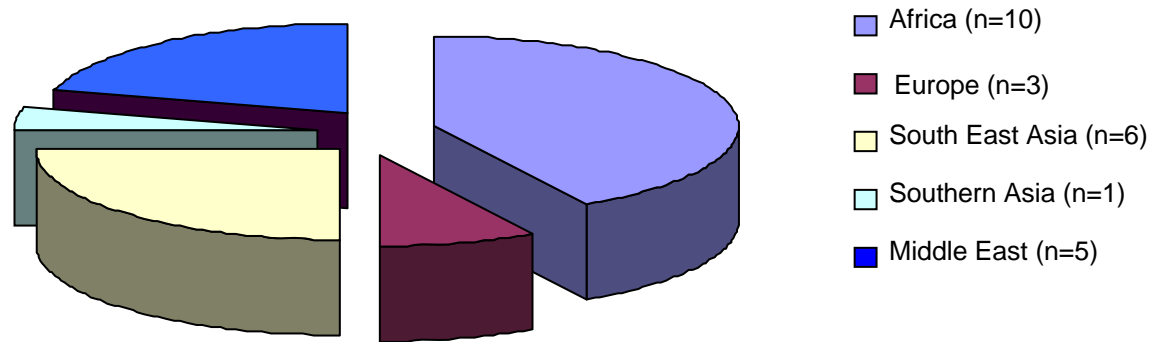
**Preliminary
Vaccine
Matching for
latest
(Jordan)
viruses of
these types**

Elisa

	A22	Alrn87	AK35/80	AMay 97	ASau95
A Jor 3/2006	r0.52	r0.12	r0.23	r0.32	r0.32
A Jor 4/2006	r0.44	r0.19	r0.19	r0.19	r0.18

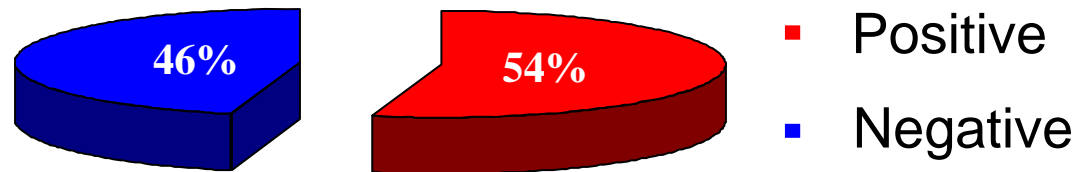
WRL Submissions in 2006

25 countries have submitted clinical samples or isolates to WRL in 2006



Of 578 specimens 421 were collected in 2006 and 157 in 2004-2005

ELISA and/or isolation in cell culture



in vitro characterisation

296 isolates sequenced (VP1)

74 antigenically characterised by ELISA and/or VNT

578 Samples received January 2006 - December 2006

From 25 countries

IRELAND

TURKEY

UK

CHINA (HK)

IRAN

ISREAL

JORDAN

KUWAIT

LAOS

MALAYSIA

MYANMAR

PAKISTAN

SAUDI ARABIA

THAILAND

VIETNAM

BENIN

BOTSWANA

D.R. OF CONGO

EGYPT

ETHIOPIA

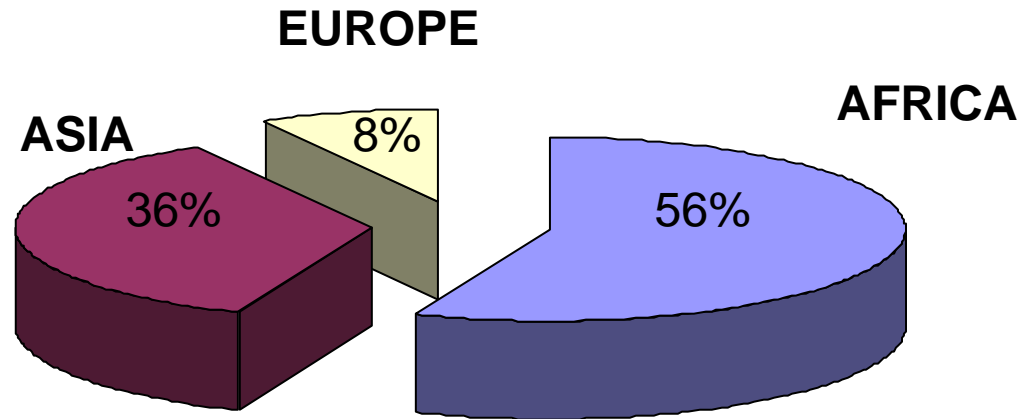
KENYA

MAURITANIA

NIGER

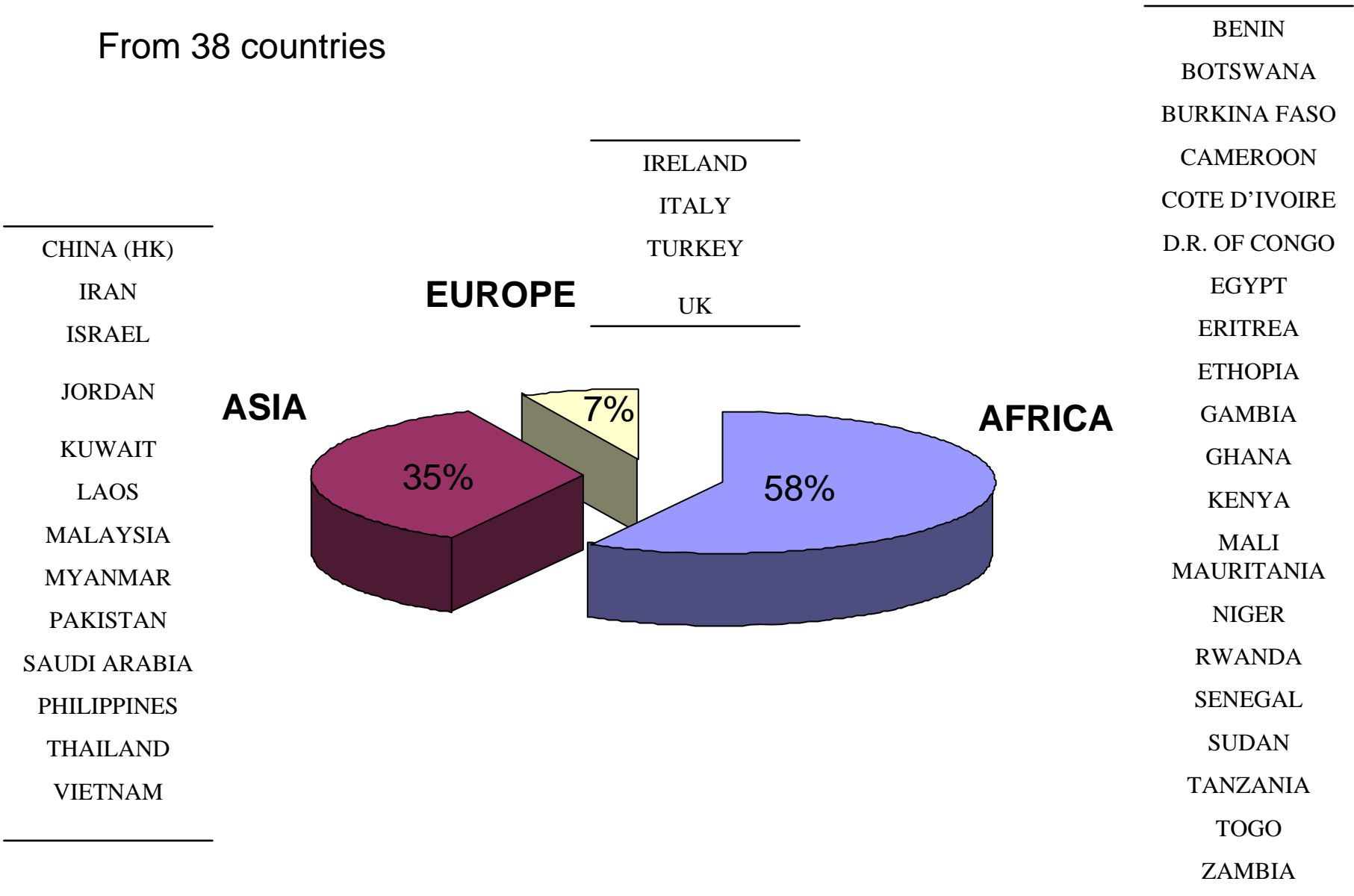
RWANDA

SENEGAL



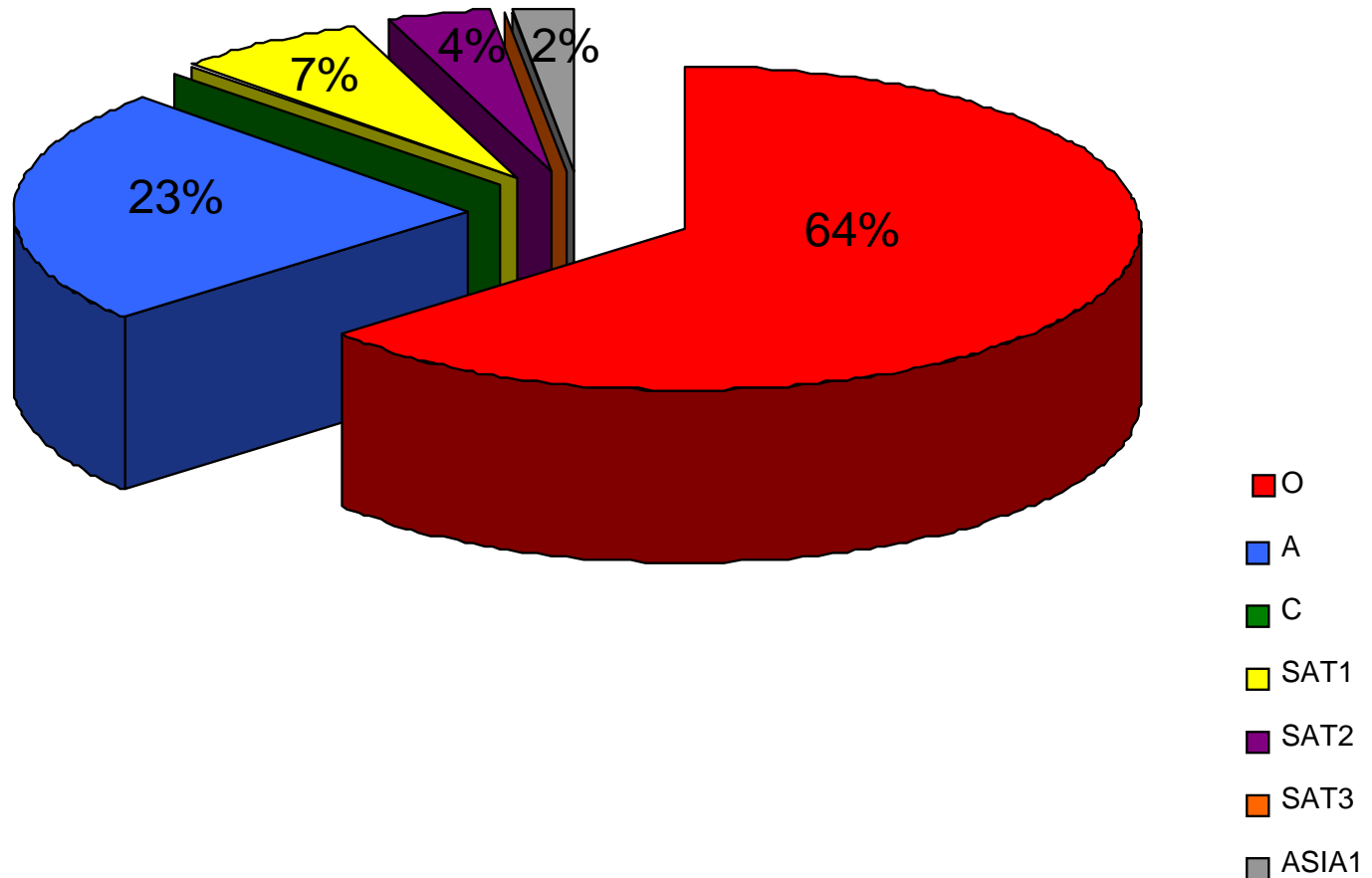
1158 Samples received October 2004- December 2006

From 38 countries



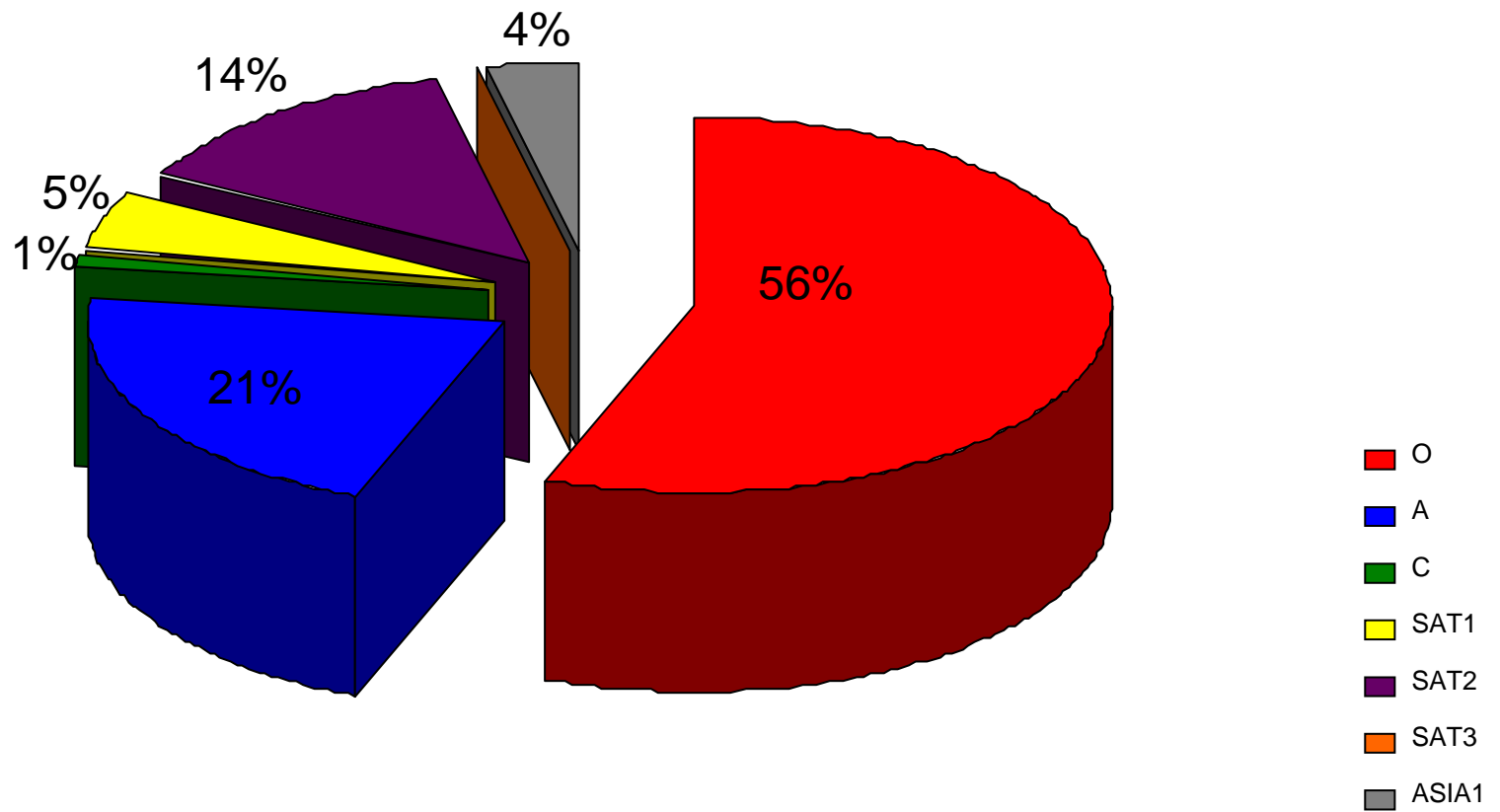
FMDV Viruses Isolated by WRL FMD

January 2006 - December 2006



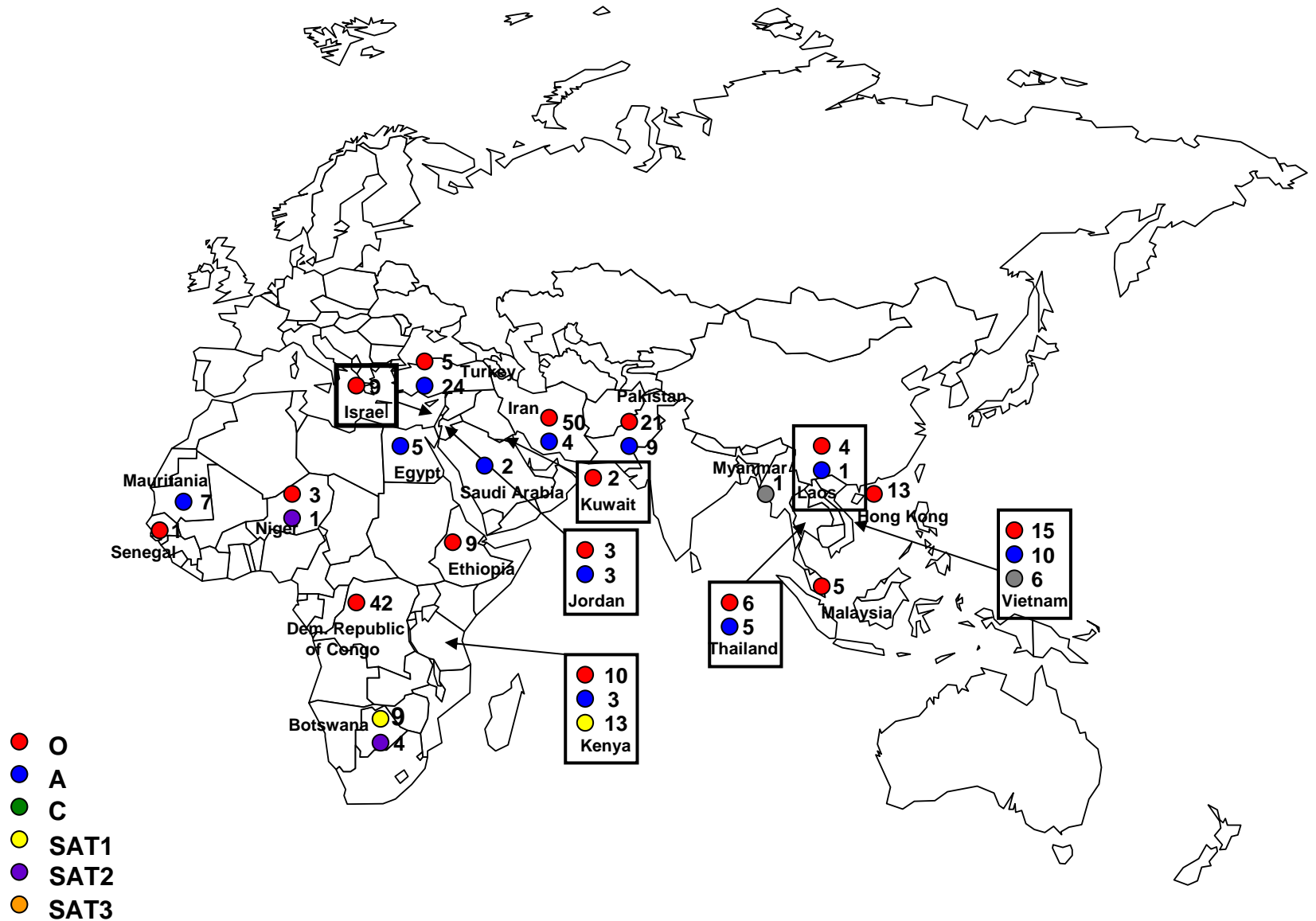
(n=311)

FMDV Viruses Isolated by WRL FMD October 2004 - December 2006

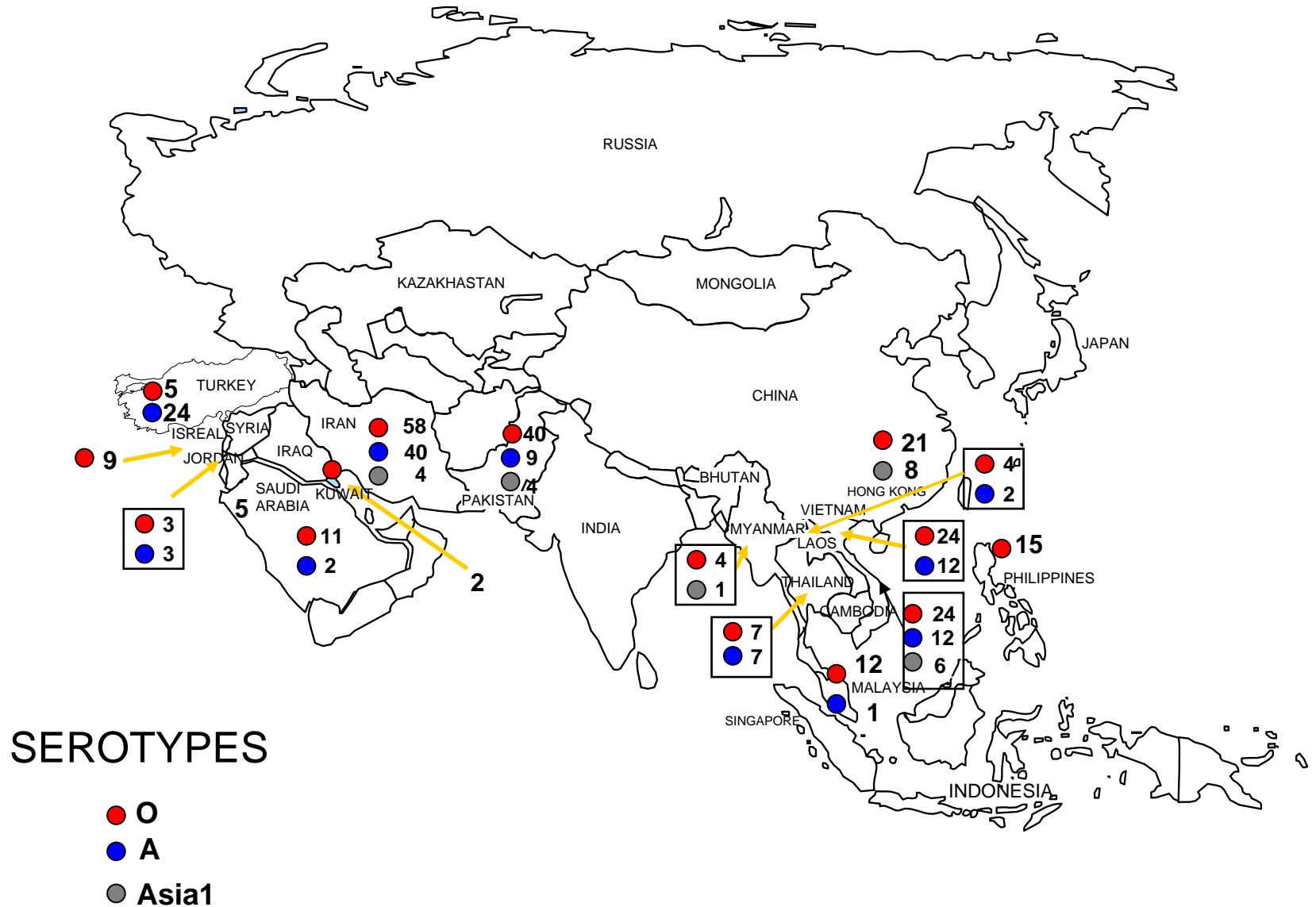


(n=624)

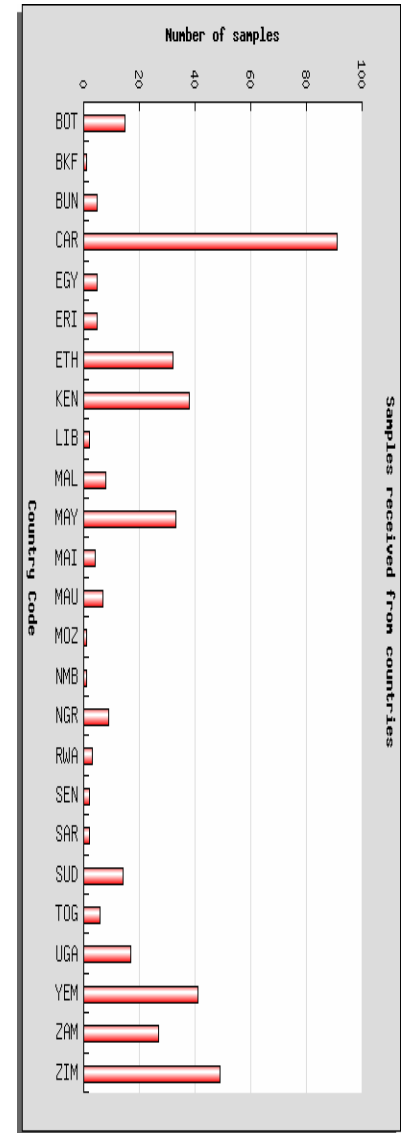
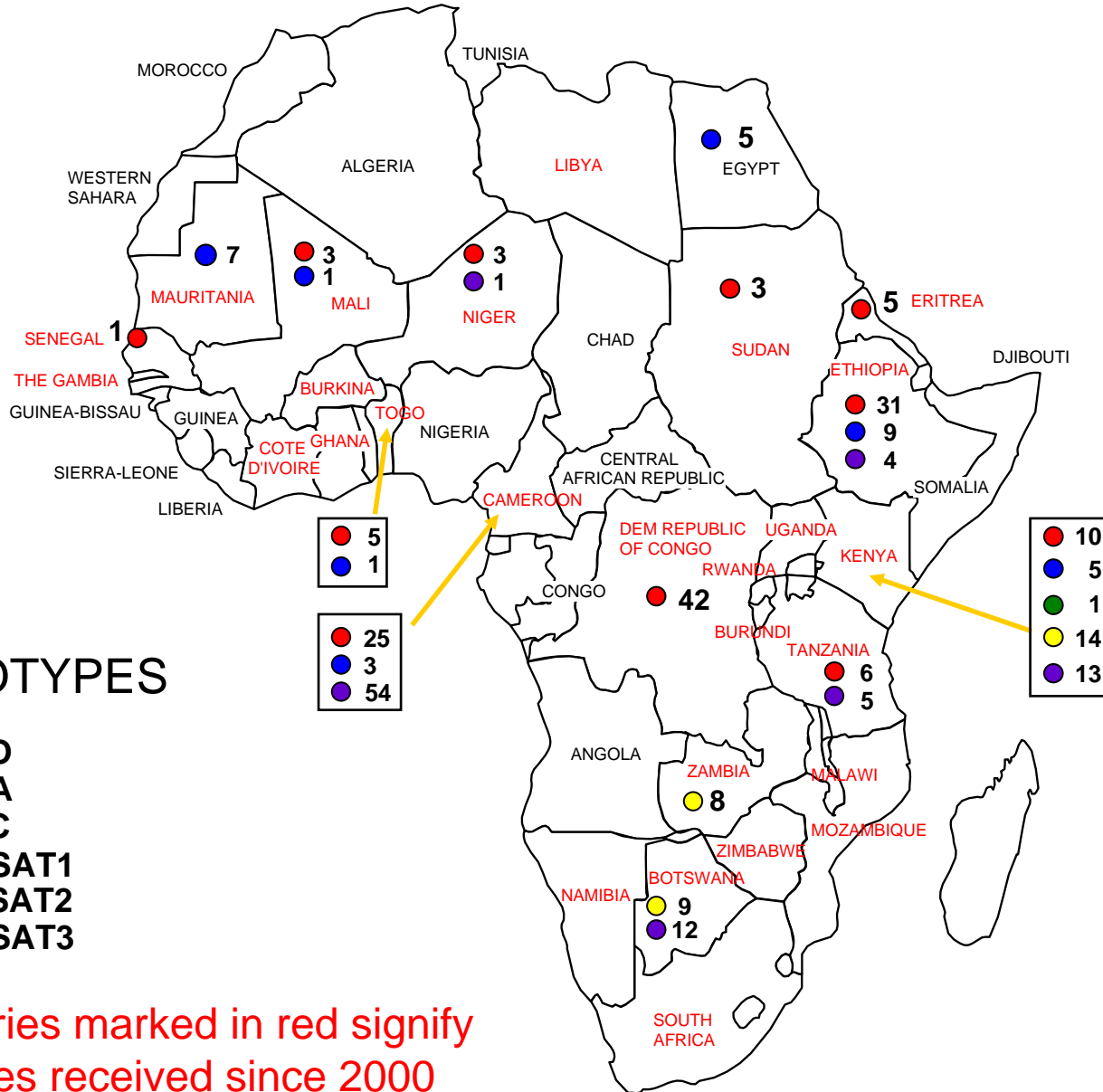
FMDV Viruses Isolated by WRL FMD January 2006 - December 2006



FMDV Viruses Isolated by WRL FMD October 2004-December 2006



FMDV Viruses Isolated by WRL FMD October 2004-December 2006

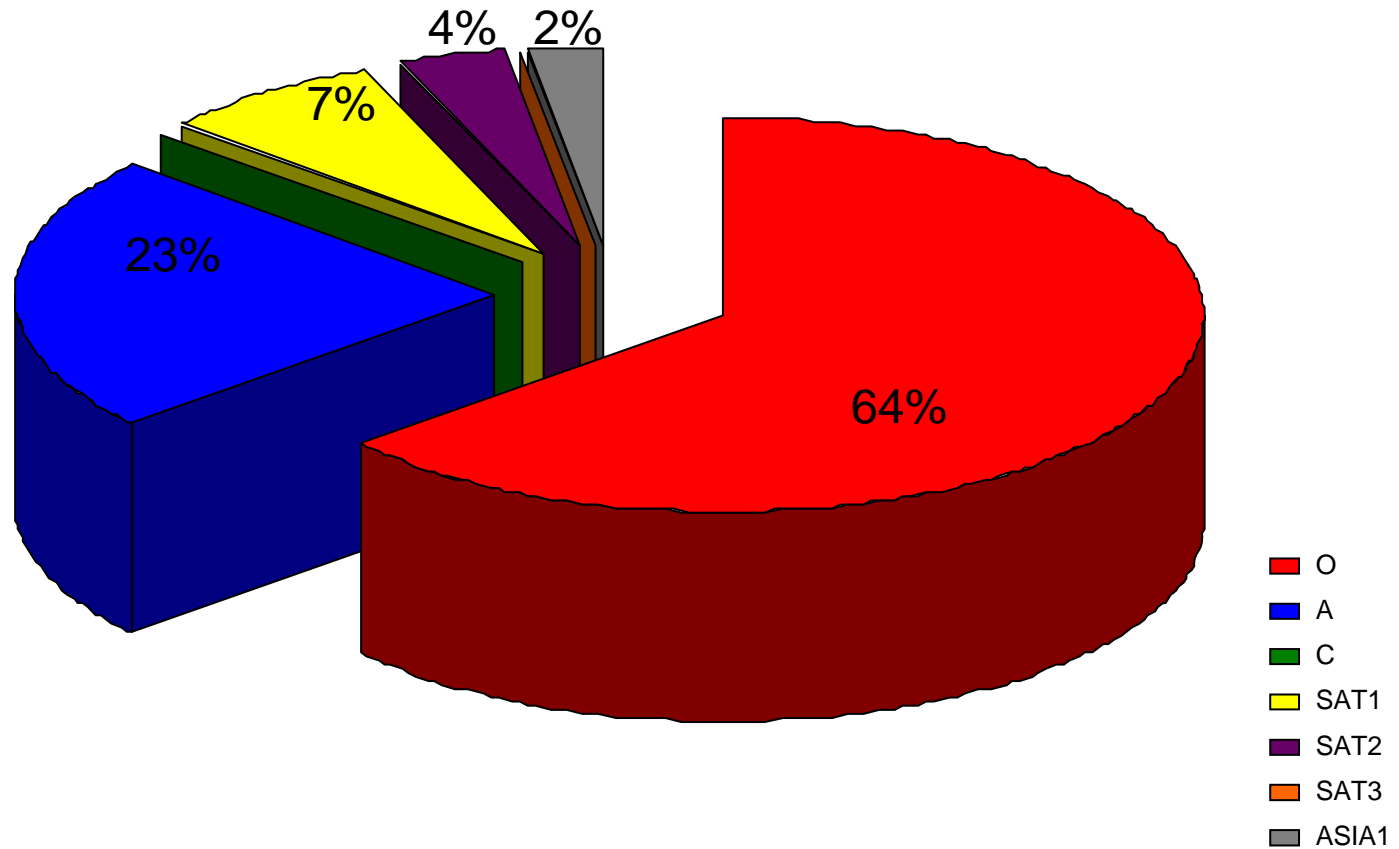


Virus +ve samples received since 2000

Samples received from countries

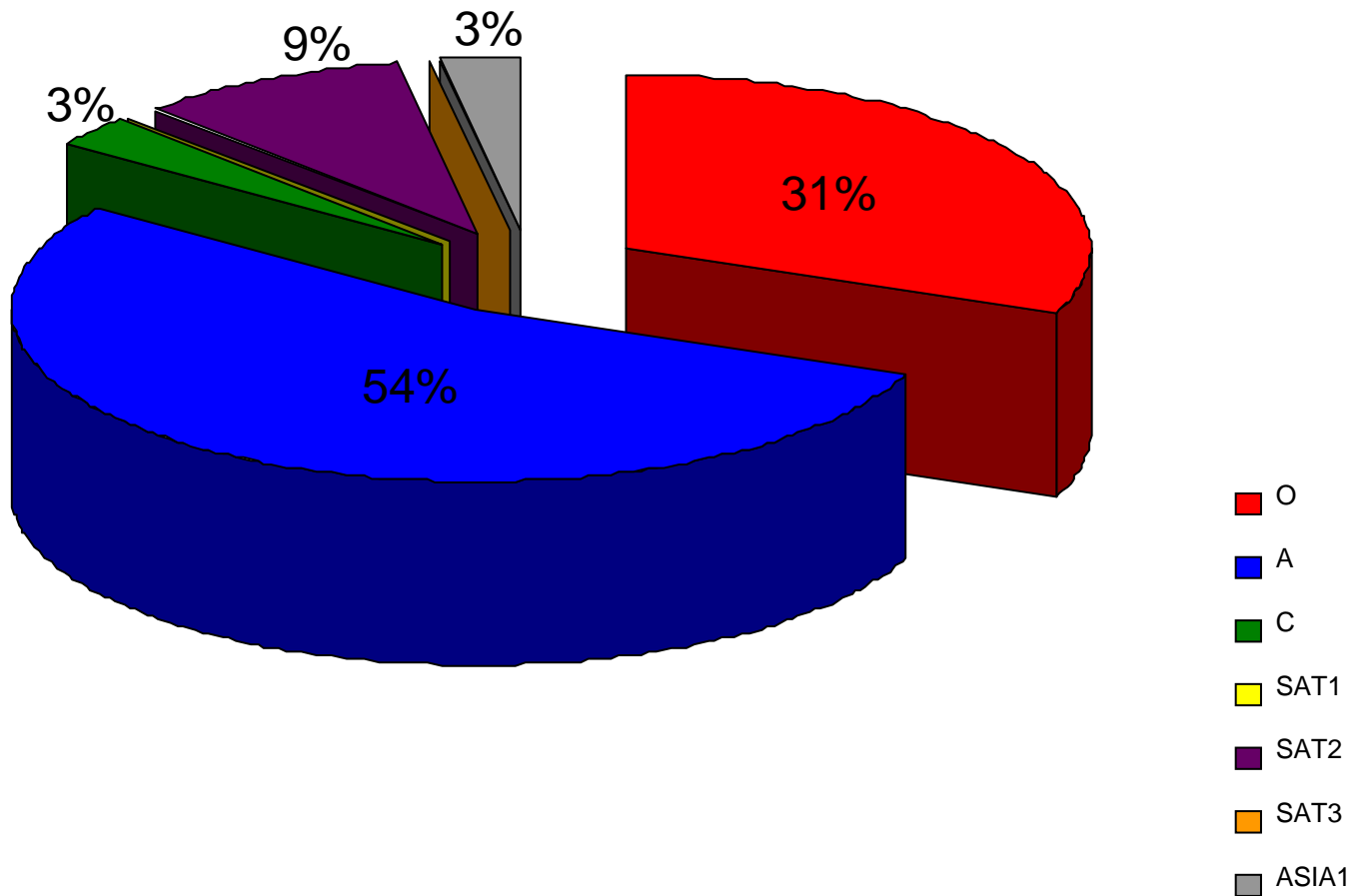
Countries marked in red signify samples received since 2000

Isolates Sequenced (VP1) 2006



(n=296)

Antigenic Characterisation 2006



(n=74)

Vaccine requirements by serotype

- Serotype O
 - The most important for vaccine antigen reserves
 - Genetically diverse but antigenically fairly restricted.
Two main vaccine types
- Serotype A and SATs
 - Genetically and antigenically diverse. Need for multiple vaccine strains
- Serotype Asia 1
 - Antigenically homogeneous. One vaccine
- Serotype C
 - Should we be vaccinating at all?
- SAT 1 still prevalent in parts of S Africa, but not SAT 3

RECOMMENDATIONS FROM THE WRL ON FMD VIRUS STRAINS TO BE INCLUDED
IN FMDV ANTIGEN BANKS – JUNE 2006

High Priority

O Manisa (*covers PanAsia topotype*)

O BFS or Campos

A24 Cruzeiro

Asia 1 Shamir

A Iran '96

A22 Iraq — moved from medium to high

SAT 2 Saudi Arabia (*or equivalent*)

(not in order of importance)

RECENT
SEROTYPE A
from the
MIDDLE EAST

Medium Priority

A Eritrea —moved from low to medium

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)

EGYPTIAN
SEROTYPE A

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)

A22 Iraq versus A Egypt 2006

- Heterologous challenge study - B Haas at FLI
- r value ~ 0.23 but $PD_{50} \sim 10$
- Unknown homologous PD_{50} , - probably very high
- Combination of potency and match
- r values only give match
- Can measure antibody to heterologous virus without correction factor for batch-specific predictor
- Emphasizes value of high potency vaccines

Coordination and dissemination activities

- CRL established June 2006
- CA FMD-CSF
- Diagnostic quality assurance
- Training
- Network of FMD Ref Labs and dissemination of information
 - FMD BioPortal / ReLaIS
- GFRA and Agra meeting

Conclusions on Risk

- Risk is from primary endemic areas in Asia, Africa and South America
- Topotype distributions
- When to react?
 - Big upsurges in cases – which is when these countries tend to submit viruses
 - Extensions of topotypes
 - Spread to sporadically affected countries at border between endemic and free areas
- Gaps in knowledge?
 - Problems of access to information – e.g. China and India – use surrogate neighbours and foster collaboration
 - Problems of lack of data - Africa – need to support surveillance and lab work (twinning concept of OIE?)
- Priority areas remain Middle East (including former Soviet States) and Sub-Saharan Africa
 - Mauretania cases indicate possible threat to N Africa with potentially similar vaccine matching issues as Egypt in 2006