

# Foot and mouth disease control strategies in North Africa and the Middle East

## The current situation

Asuncion, Paraguay, 24-26 June 2009

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# Acknowledgements

- OIE – FAO Regional Animal Health Centre North Africa – Tunis
- OIE – FAO Regional Animal Health Centre Middle East - Beirut



## References

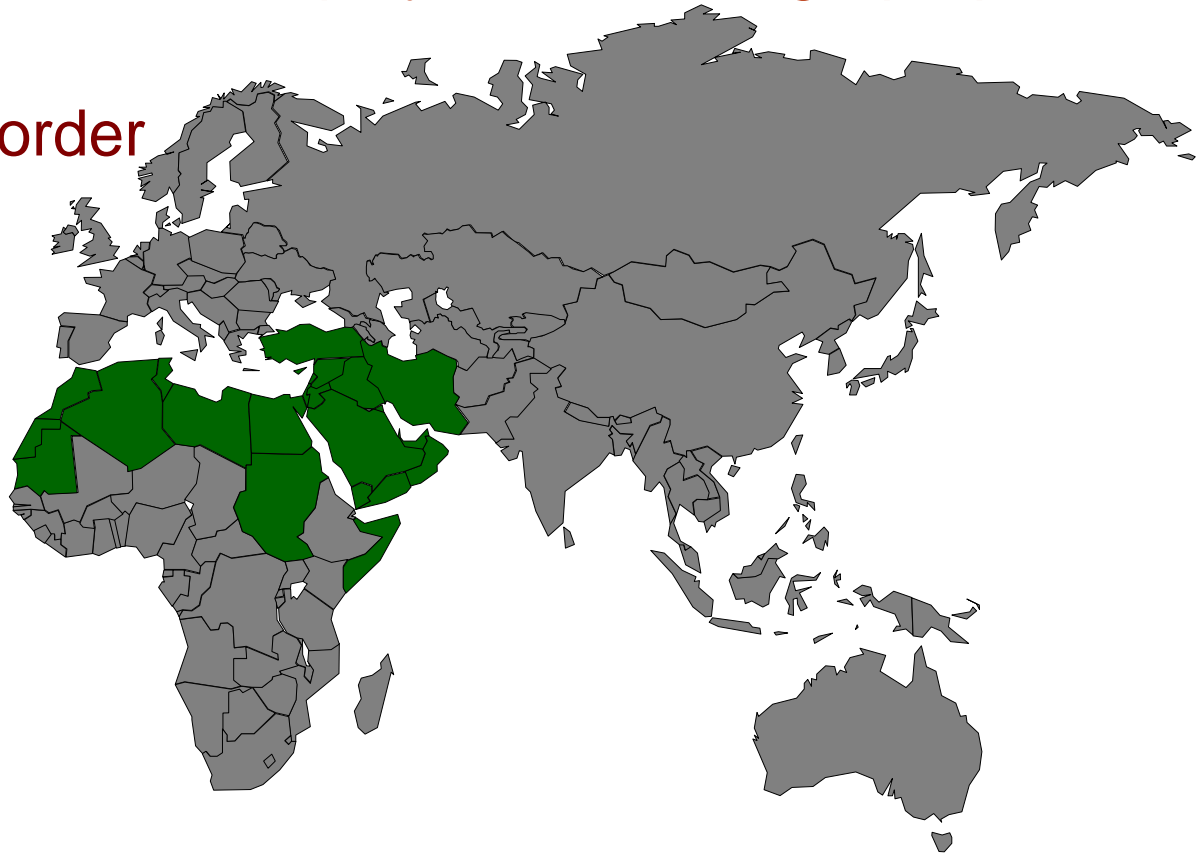
- Questionnaires, discussions, conclusions and recommendations of:
  - 4th FMD Round Table for the control of the disease in the Middle East, Amman, September 2007
  - 5th FMD Round Table for the control of the disease in the Middle East, Beirut, April 2009
  - 4th FMD Round Table for the control of the disease in North Africa, Rabat, October 2007

- Particularities of the region
- The current situation i) in the Middle East and ii) in North Africa
- Current strategies adopted to control the disease
- What could be done – An example: the Middle East
- General conclusions



# Particularities of this region

- Large ruminant livestock resources in most countries, providing livelihood and employment to a high proportion of the population
- Extensive land border



# Particularities of this region

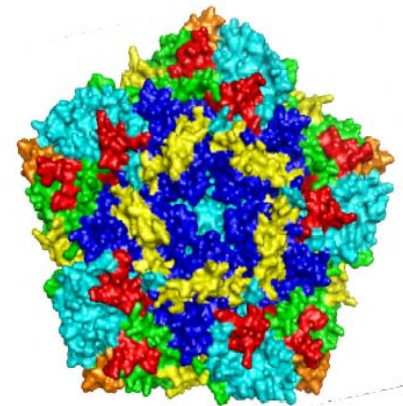
- Much of the region is arid or semi arid, which drastically limits the potential availability of natural pasture
- Importance of transhumance and animal movement between neighbouring countries, notably in order to satisfy people needs during Muslim special events (Hajj and Ramadan)
- Such fluidity has significant consequences for the spread of animal diseases, FMD notably



# Main Animal movement ways



# The current situation in the Middle East



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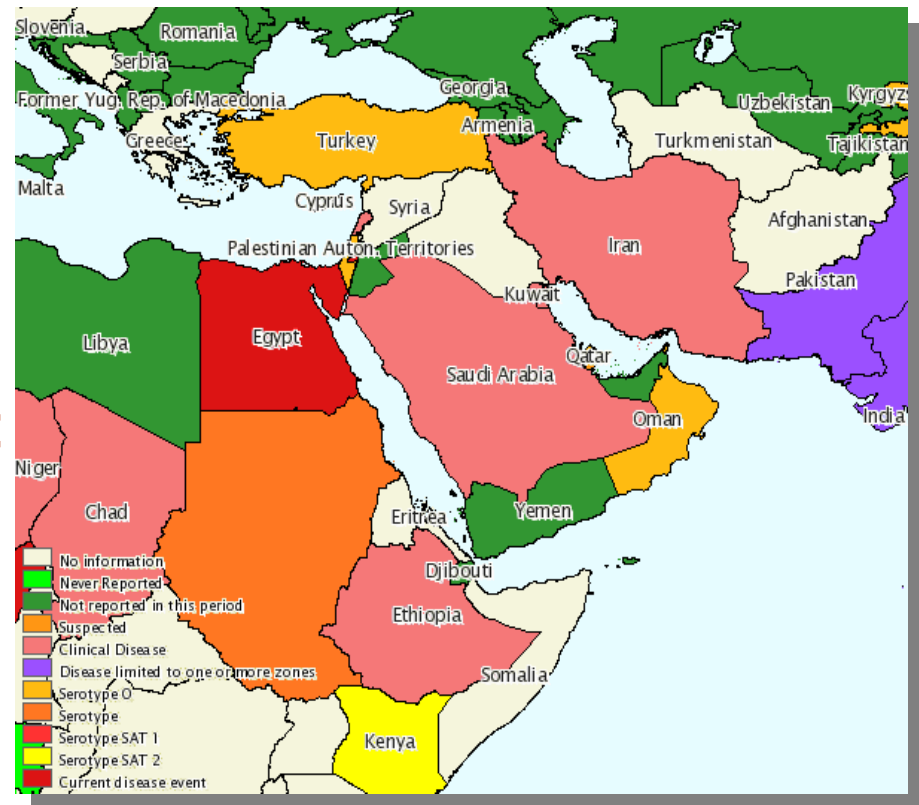
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# Circulating strains in the ME

- FMD is endemic and widely spread among various animal species in the Middle East
- Different strains and variants of FMD viruses are present: principally O and A strains
- Periodic devastating epidemics with new serotypes spread rapidly across national and regional borders



# Circulating strains in the ME

- In 2005, A-Irn-05 emerged in Iran
- Since then this strain spreads to Saudi Arabia, Turkey (including Thrace), Jordan, Afghanistan, Pakistan and recently Iraq, Kuwait, Bahrain, Lebanon and Libya
- Since August 2007, a new sublineage appears in Turkey (A Iran 05-ARD-07)



# Circulating strains in the ME

- In 2006, FMDV type A was introduced into Egypt from East Africa
- New cases in 2009
- This suggests the establishment of this East African strain in the Mediterranean region



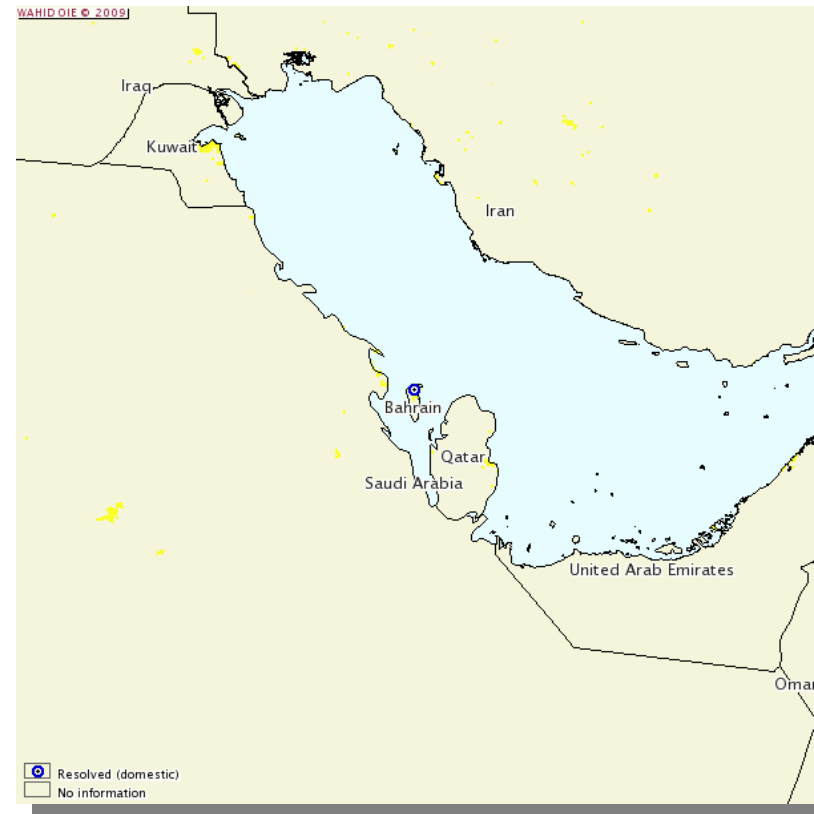
# Circulating strains in the ME

- In 2006 - 2007 new O lineage: O PanAsia 2
- Probably originated from India (2001)
- Dispersal to Afghanistan, Pakistan, Iran, Jordan, Turkey, Israel, PAT, Lebanon (probably), UAE, KSA and Egypt
- Vaccine matching with O Manisa

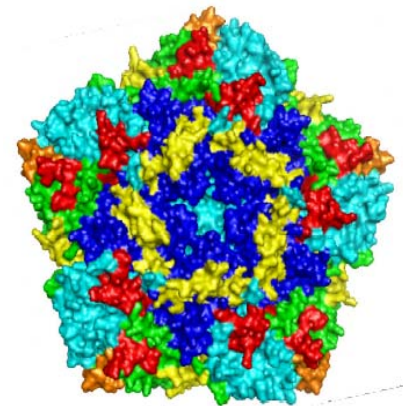


# Circulating strains in the ME

- In April 2009, Bahrain reported to the OIE one outbreak of Asia 1 linked with the introduction of new live animals in the country



# The current situation in North Africa



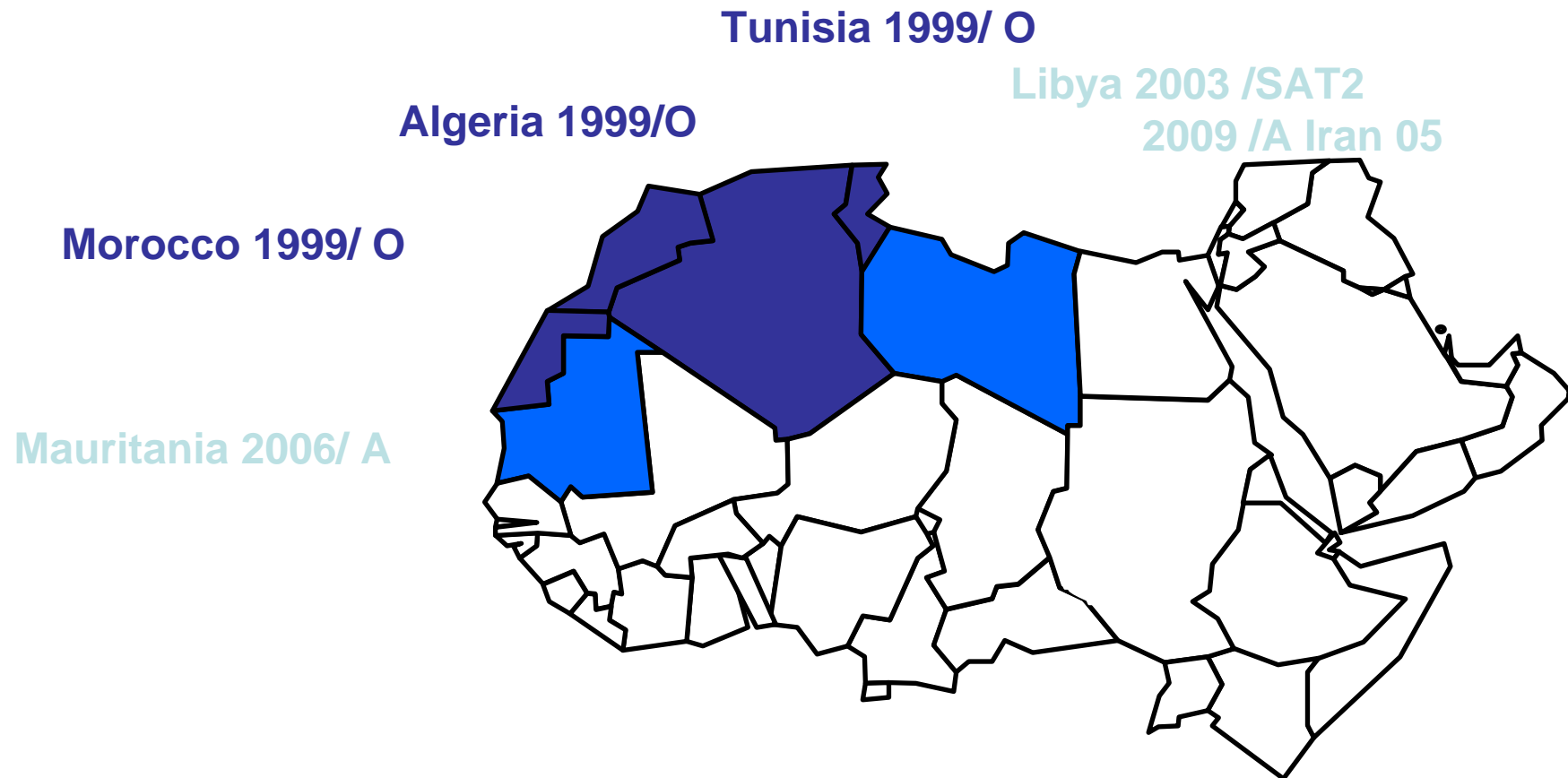
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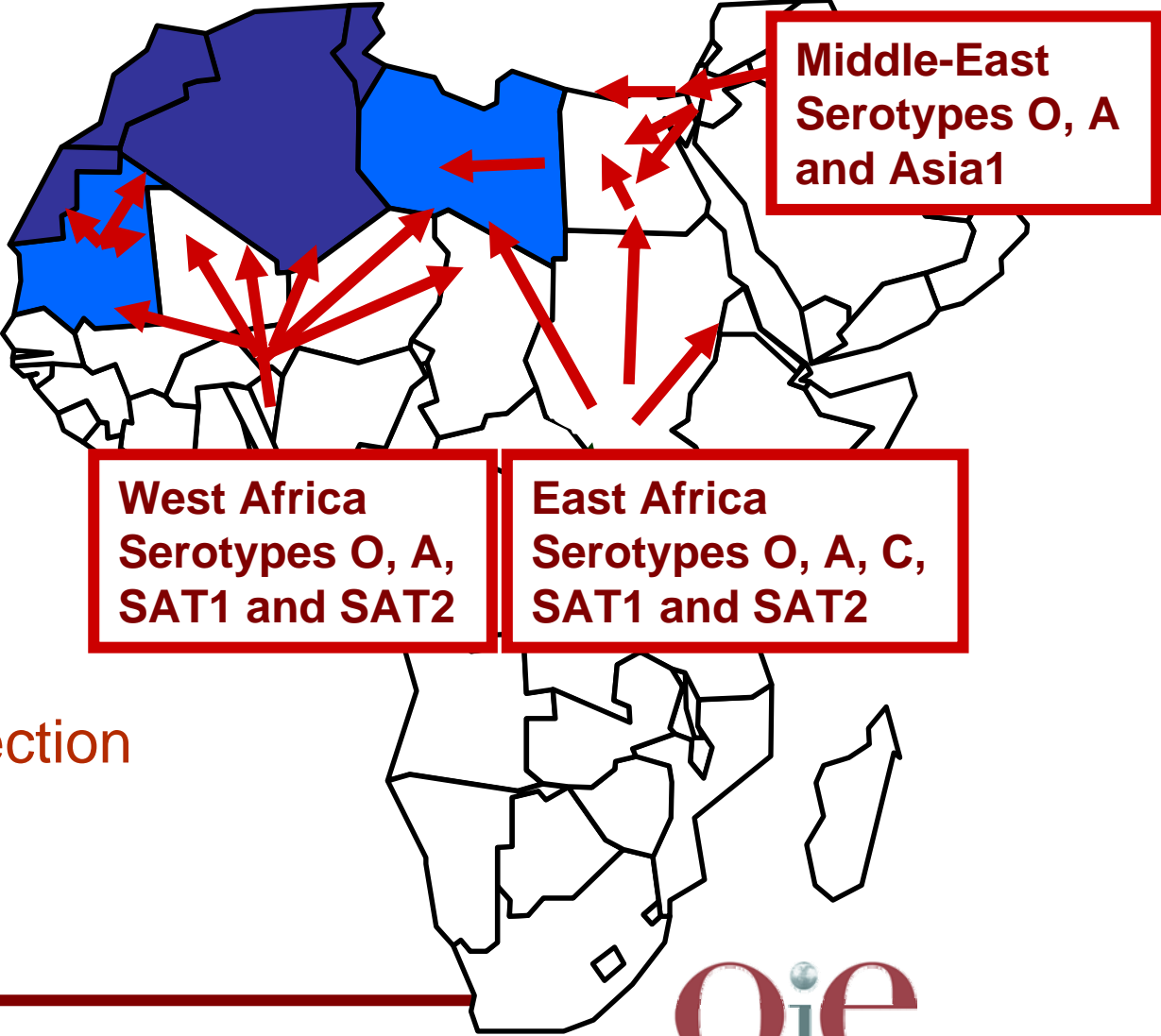
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# Circulating strains in North Africa

Sporadic occurrence – Last reports of FMD



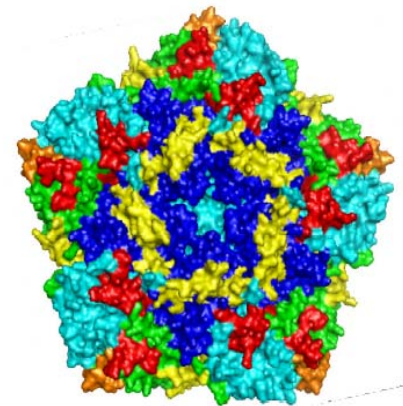
# Circulating strains in North Africa



Main sources of infection



# Current strategies adopted to control the disease



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- Laboratory and Sampling
- Surveillance
- Vaccination
- Emergency response
- Awareness programmes



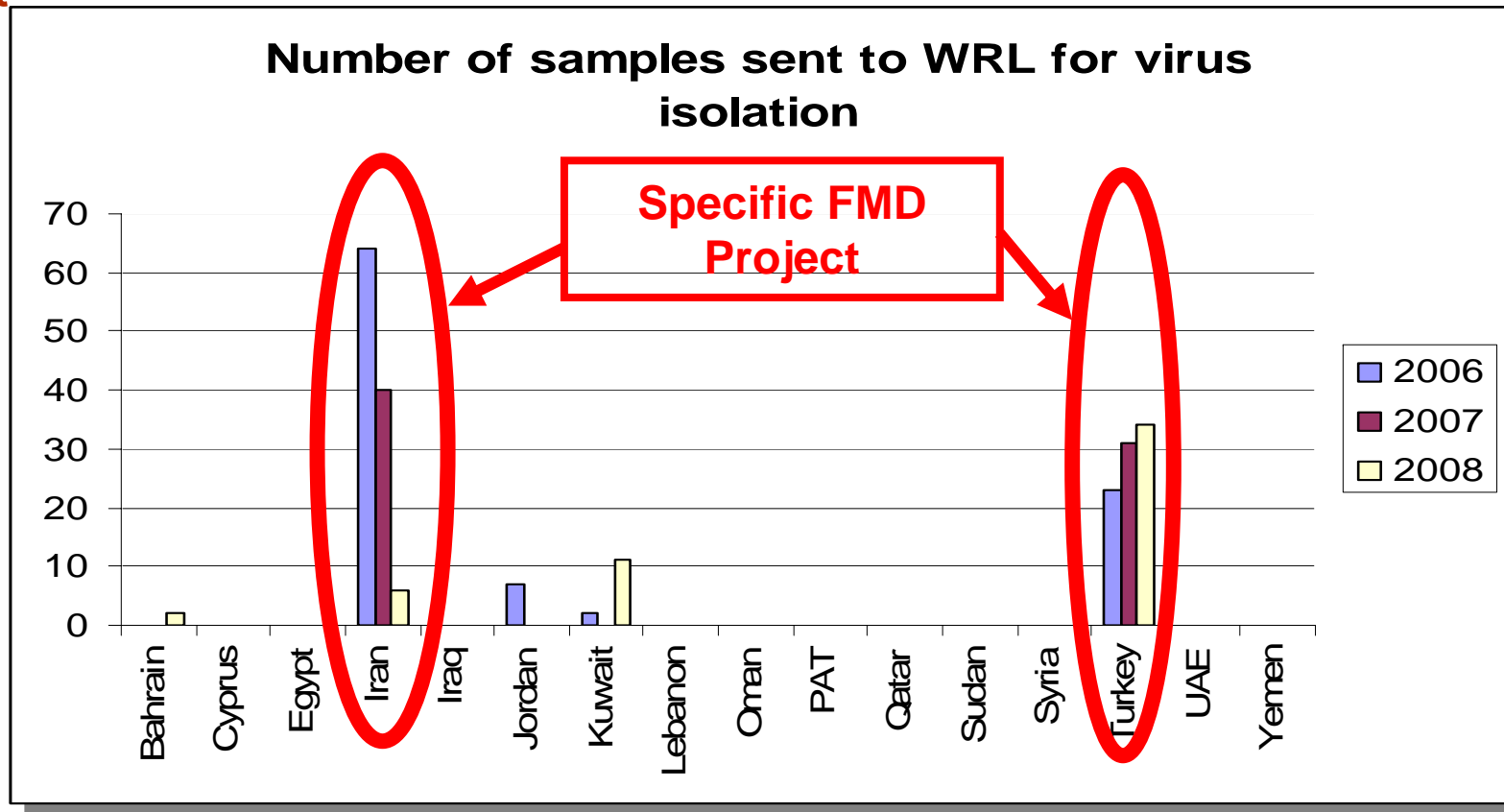
# Laboratory and Sampling

- All countries have a national official laboratory which performs FMD analyses, essentially serological analyses using ELISA tests
- Some laboratories in the region can work with live virus: Iran, Jordan, Syria, Turkey, Egypt and Morocco
- The OIE - FAO World Reference Laboratory (Pirbright) is the main reference laboratory where sample are sent



# Laboratory and Sampling

- Few samples are sent to the WRL – example of the Middle East



# Serosurveillance

Some countries have regular continuous serosurveillance programmes – with different objectives:

- To assess FMD prevalence: Turkey, Iran, North African countries
  - To evaluate immune status and post vaccination response: Bahrain, Egypt
  - To detect virus introduction: Cyprus
- In other countries, serosurveillance programmes are occasional – serosurveys – To assess FMD seroprevalence

# Vaccination

FMD vaccination is conducted in almost all of countries:

- either compulsory or implemented on a voluntary basis
- generally free of charge
- Monitored in few countries (Maghreb, Egypt)

Different vaccines and suppliers are used in the Middle East:

- Egypt, Jordan, Iran and Turkey are vaccine producers
- Other supplier sources are Europe, India, Russia and Botswana (only for Sudan)
- Morocco produced also vaccine from imported concentrated Antigen

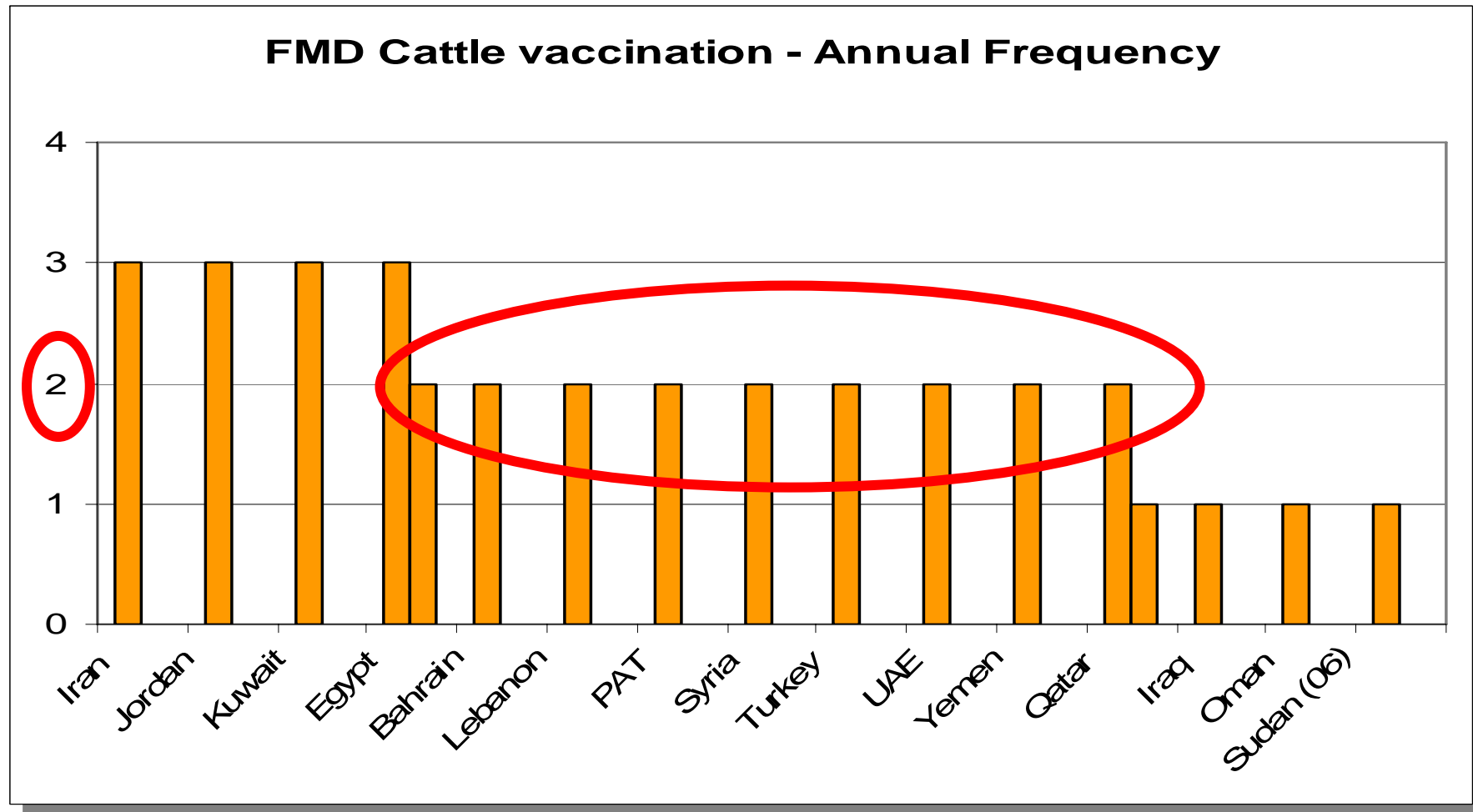


# Vaccination – Middle East Cattle

FMD Vaccine Type	Country	Annual Frequency	
Quadrivalent vaccine (O, A, SAT1 and SAT2)	Sudan (06)	Once	
Tetravalent vaccines (O, A, Asia 1 and SAT 2)	Kuwait	3 times	
	Qatar	Once or twice	
Trivalent vaccines (O India 53/73, A Iran 96, Asia 1)	Syria	Twice	
	Bahrain	Twice	
	Iran	3 times	
	Iraq	Once	
	Lebanon	Twice	
	Oman	Once	
	PAT	Twice	
	Turkey	Twice	
	Bivalent vaccines (A and O Manisa).	Egypt	Twice or 3 Times
		Jordan	3 times
Turkey		Twice	
Yemen		Twice	

Trivalent (O, A 22, Asia 1)

# Vaccination – Middle East Cattle





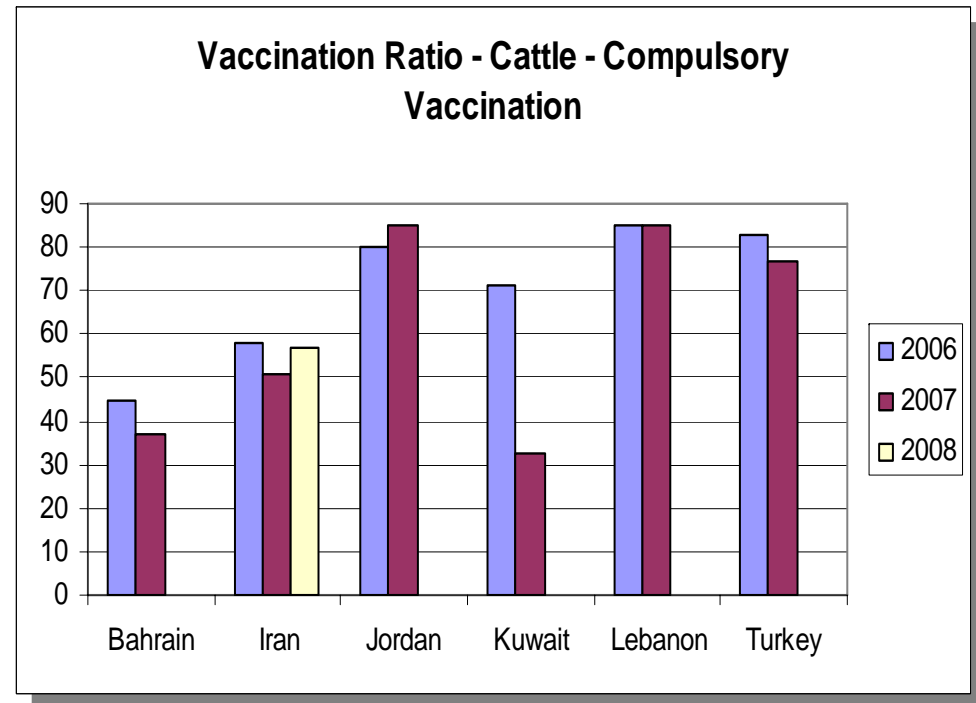
# Vaccination – Middle East Small Ruminants

FMD Vaccine Type – Sheep and Goats	Country	Annual Frequency
Tetravalent vaccines (O, A, Asia 1 and SAT 2)	Qatar	Once – twice
Trivalent vaccines (O India 53/73, A Iran 96, Asia 1)	Syria	Once
Trivalent (O, A 22, Asia 1)	Bahrain	Twice
	Iran	Once
	Oman	Once
Bivalent (A and O Manisa)	Turkey	Once
Monovalent (O Manisa)	Iraq	Once
	Jordan	Twice – 3 times
	PAT	Once - Twice

# Vaccination – Middle East

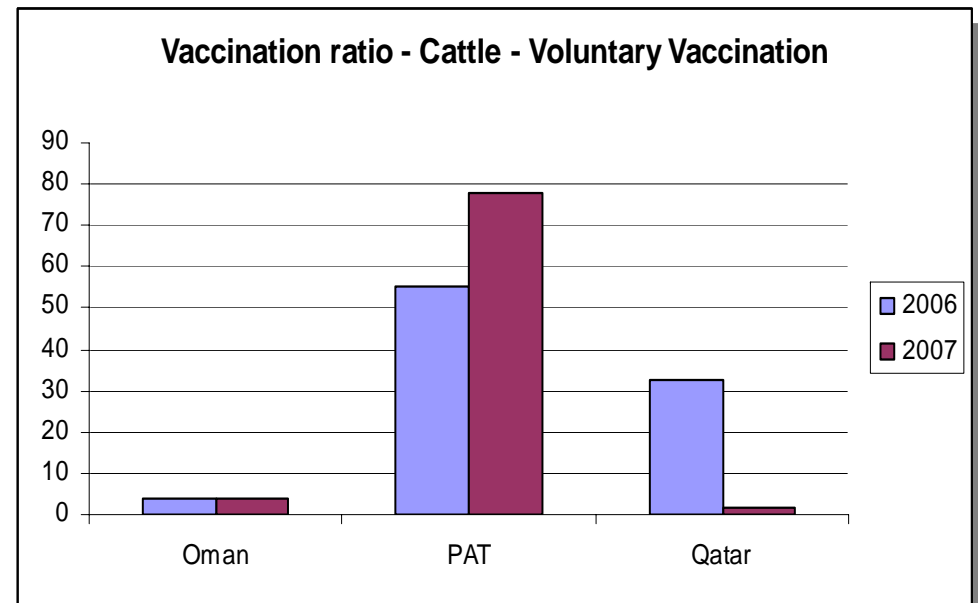
The vaccination number is very variable country by country

- In countries where the vaccination is implemented on a compulsory basis, the immune population ratios are fluctuating between 30 to 85 % in cattle, 40 to 90 % in sheep and goats



# Vaccination – Middle East

- In those where the vaccination is implemented on a voluntary basis, the ratios are very low or no information is provide
- except for the PAT where 78 % of the cattle population and 63 % of the sheep and goat population were vaccinated in 2007



# Vaccination – North Africa

Country	Strategy	Type of FMD vaccine	Annual Frequency	Vaccinated population
Morocco	Stopped in 2007 Before Mandatory and free	Monovalent O North Africa	Once between Sept to Dec	90
Tunisia	Mandatory and free	Tetravalent O Manisa, O Maghreb, A22, SAT 2	Once between Sept to Dec	75
Algeria	Mandatory and free	Bivalent O Manisa, A 22	once	70
Libya	Depends on FMD situation Around outbreaks	Tetravalent A, O, C, SAT 2		

Vaccination in small ruminants is done in Tunisia (O, A, SAT2) and Libya (O,A,C, SAT2)

# Vaccination – Summary

- Vaccination strategies and vaccines strains used in this region are very heterogeneous
- Vaccination calendar are not often linked with epidemiological situation
- Vaccination coverage is not satisfactory in most of the countries
- The control vaccination efficacy is rarely implemented



# Emergency response

- FMD is a mandatory notifiable disease in all country
- Only few countries have a National Emergency Fund available for FMD emergency response
- In the Maghreb region zoning is implemented to restrict animal movement in case of emergency
- No Emergency Antigen Bank available in none country
- An Emergency Stock of Vaccine is available only in very few countries
- Punctual agreement could be signed for vaccine supplying in emergency situation

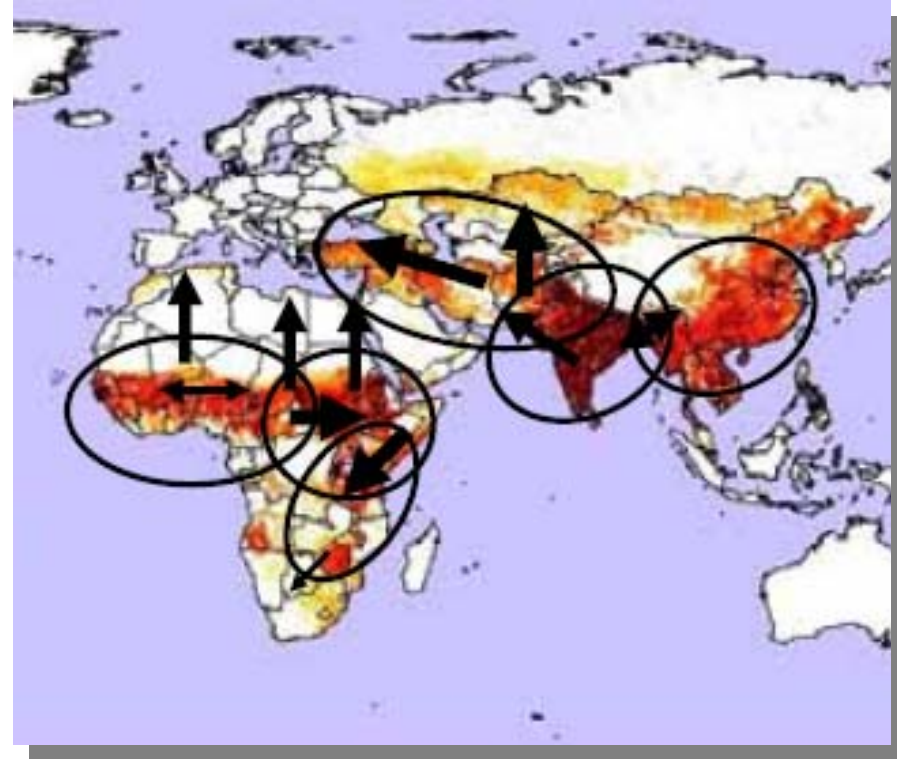
# Awareness programmes

- All countries have awareness programmes on FMD, mainly focused on farmers, with sometimes regular training
- Depending on country situation, regular meetings are organised with farmers and farmers associations, or on a regular basis
- Media awareness programmes are used in some countries

# FMD Situation in the MENA - Conclusions

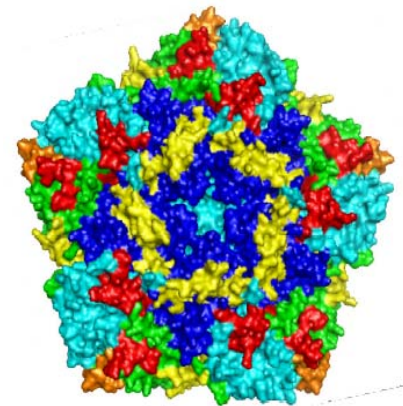
## MENA :

- One of the FMD high risk regions
- High weight of infection with antigenic diversity
- Source of emergent viruses
- Threat for neighbouring regions





# What could be done to control the disease



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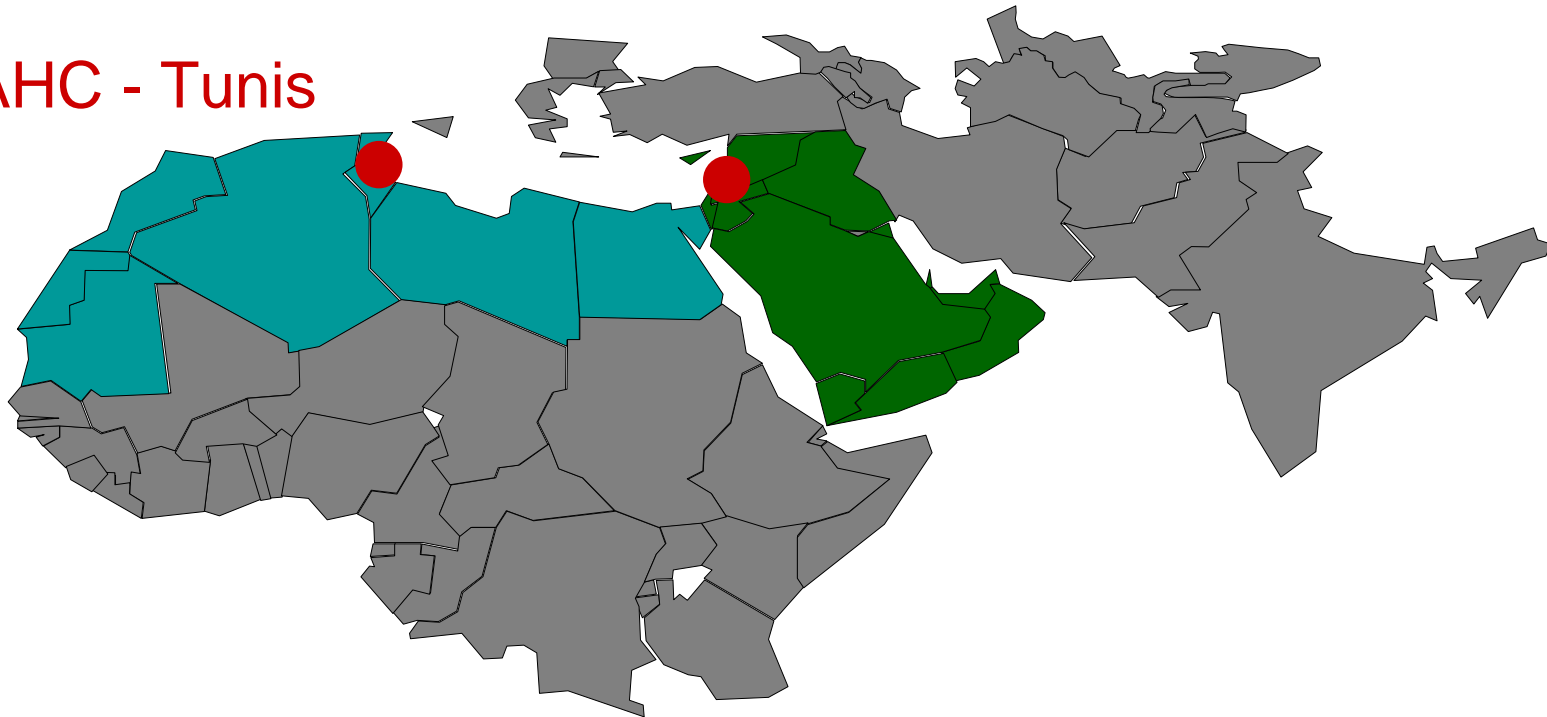
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# Regional Approach

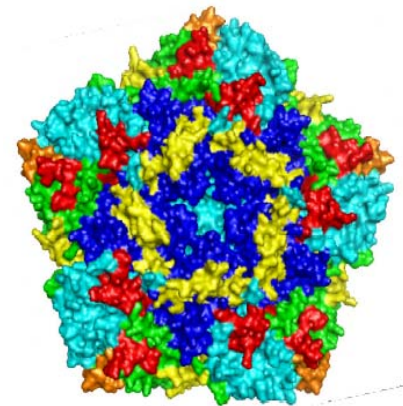
MENA region could be divided in 2 sub-regional epidemiological units

RAHC - Tunis

RAHC - Beirut



# Summary of the frame developed for the Middle East – 5th FMD Round Table Beirut



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# General framework

The main objective of the programme is to increase and harmonise the level of FMD surveillance and control in the Middle East region, including:

- Assessing current country strategies to manage the disease
- Harmonisation between countries surveillance strategies, vaccine programs, vaccine monitoring, animals and animal products movement control
- Training technical staff to conduct appropriate prevention and control measures against the disease
- Implementing appropriate measures and methodologies in collaboration with the WRL for FMD, to identify FMD strains circulating in the region and potential introduction of others

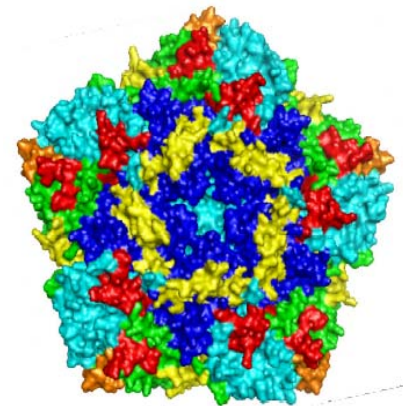
# General framework

## Taking into account the Progressive Control Pathway - Annual Self Assessment

- Use of the tool developed by FAO (part of the progressive FMD risk reduction approach) → level 0 to 5
- Presented during the 5th FMD Round Table and answered by the CVOs of the region

Countries	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Jordan	Orange	Orange	Yellow	Yellow	Light Green							
Oman	Yellow	Yellow	Light Green	Light Green								
Kuwait	Yellow	Yellow	Light Green									
Lebanon	Red	Orange	Orange	Orange	Yellow	Yellow	Light Green					
PAT	Red	Orange										
Syria	Light Green	Light Green										
Turkey Thrace	Light Green	Light Green	Dark Green	Dark Green								
Turkey Anatolia	Yellow	Yellow	Yellow	Yellow	Yellow	Light Green	Light Green	Dark Green	Dark Green			

# General Conclusions



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# Conclusions

- FMD is a main constraint of animal production in the MENA region
- To control the disease in the region, vaccination in large ruminants, sometimes also in small ruminants, is the common strategy adopted. These vaccination programs are not harmonized between countries with regularly a poor vaccine matching
- The lack of relevant and harmonized surveillance programs with well trained staff, the lack of early warning and rapid response systems in most countries of the region and the poor level of transparency and collaboration between countries are important factors hampering the well control of the disease

# Conclusions

- The extensive land border in the region and the importance of transhumance and animal movement between neighbouring countries, notably in order to satisfy people needs during Muslim special events (Hajj and Ramadan) make the disease control even more difficult
- Furthermore, some countries are not able to secure funding within their budgets for FMD surveillance and control programs
- The MENA region is much more complex than other regions, regarding its geographical location, at the crossing of three continents, and shall be recognized as a high risk area for the spread of FMD virus to neighbouring regions, especially Europe



# Conclusions

- The implementation of a harmonized and coordinated program to control the disease shall be a priority, position regularly wished by regional countries
- The newly created OIE – FAO Regional Animal Health Centres, in Beirut and Tunis, under the auspices of Regional Steering Committees of the GF-TADs shall be the relevant structures to carry such program in the frame of a global strategy

# Thank you for your attention



**OIE – FAO Regional Animal Centre for the Middle East  
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