Occurrence of FMD in Africa with special reference to incursion of FMD serotype O into Southern Africa

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PRESENTATION OUTLINE

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- Overview of FMD distribution in Africa
- FMD Situation in Southern Africa
- Epidemiological changes and concerns
- Way forward & Conclusion

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Overview of FMD distribution in Africa

- Based on information submitted to WOAH through WAHIS
- Some reports still pending
- Some “Alerts” may still be ongoing

WOAH FMD Subregional Reference Laboratory for Sub-Saharan Africa Hosted at BVI

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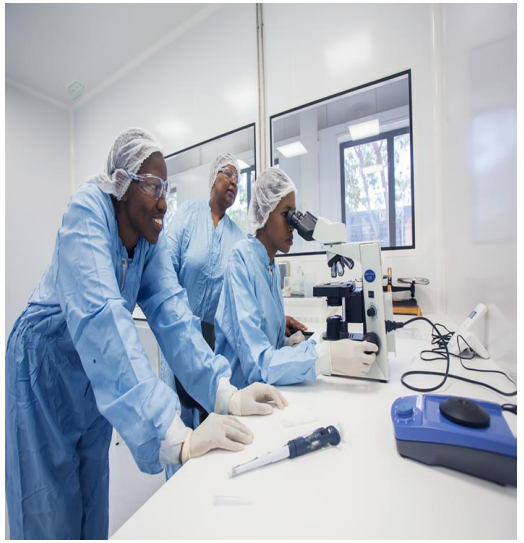
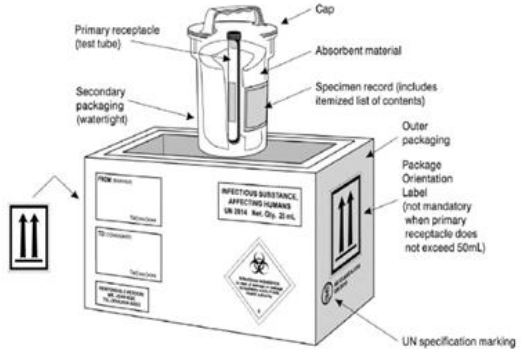
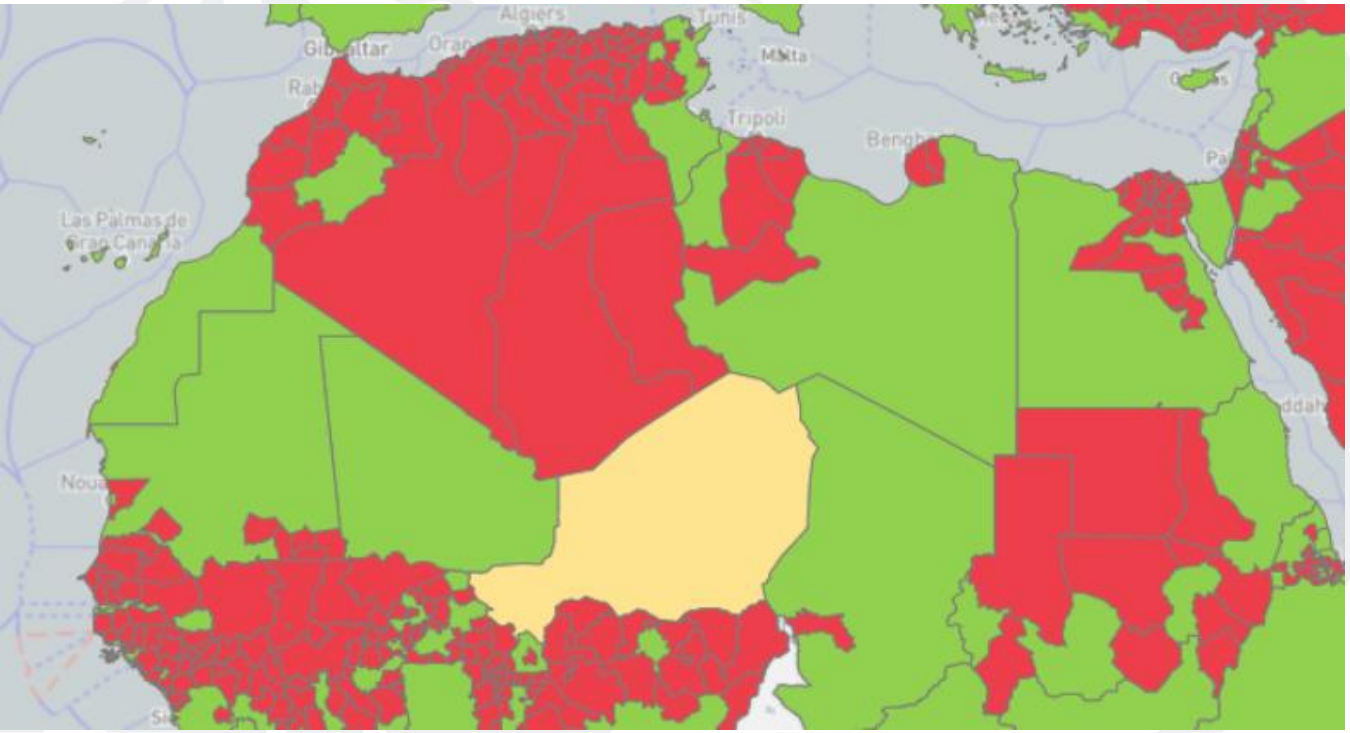
- BVI has hosted the WOAH FMD Reference Laboratory since 1985
- Designated OIE Expert: Dr Joseph Hyera
- The Laboratory provides:
  - Confirmatory diagnosis of FMD to all countries in Sub-Saharan Africa
  - Characterisation of the outbreak isolates
  - Vaccine Matching
  - On the bench training for national central veterinary laboratories
  - Field technical support (outbreak investigations, sample collection & transportation)





Northern Africa (2018-2023)



Disease present in 5 countries

Algeria (O),

Egypt (A, O, SAT2),

Libya (A and O),

Morocco (O),

Sudan (no type info),

Tunisia (O)

Type O is the most prevalent

Alerts : - as of 01/02/23

- Algeria : recurrences serotype O in June 2018 and March 2022
- Libya : recurrences serotype O in April 2019 and June 2021 + recurrence serotype A in February 2020
- Morocco : recurrences serotype O in January 2019
- Tunisia : recurrences serotype O in December 2018 and January 2022

No report available or no outbreaks were reported in the area for a disease present in the country

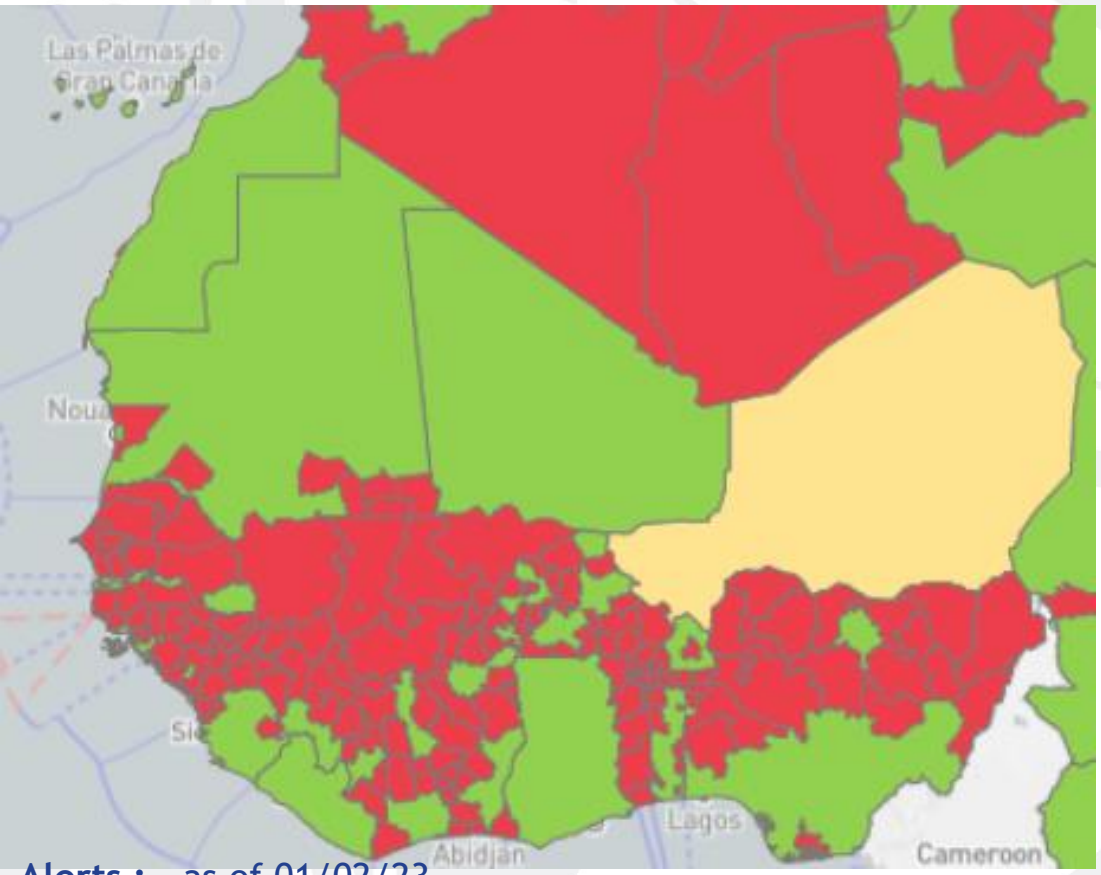
No information provided in report for selected disease(s)

Absent in the country

Suspected

Present

Western Africa (2018-2023)



Alerts : - as of 01/02/23

- Gambia : recurrence serotype O in July 2018
- Guinea : recurrence (not typed) in May 2018
- Guinea-Bissau : recurrence serotype O in August 2018
- Sierra Leone : recurrence (not typed) in August 2018

Disease present in 14 countries

Benin (O, SAT1, SAT2),
Burkina Faso (no type info),
Cote D'Ivoire (O),
Gambia (O),
Ghana (SAT1),
Guinea (O),
Guinea-Bissau (O),
Mali (A, O, SAT2),
Mauritania (no type info),
Niger (no type info),
Nigeria (A),
Senegal (A, O, SAT1, SAT2)
Sierra Leone (no type info),
Togo (no type info)

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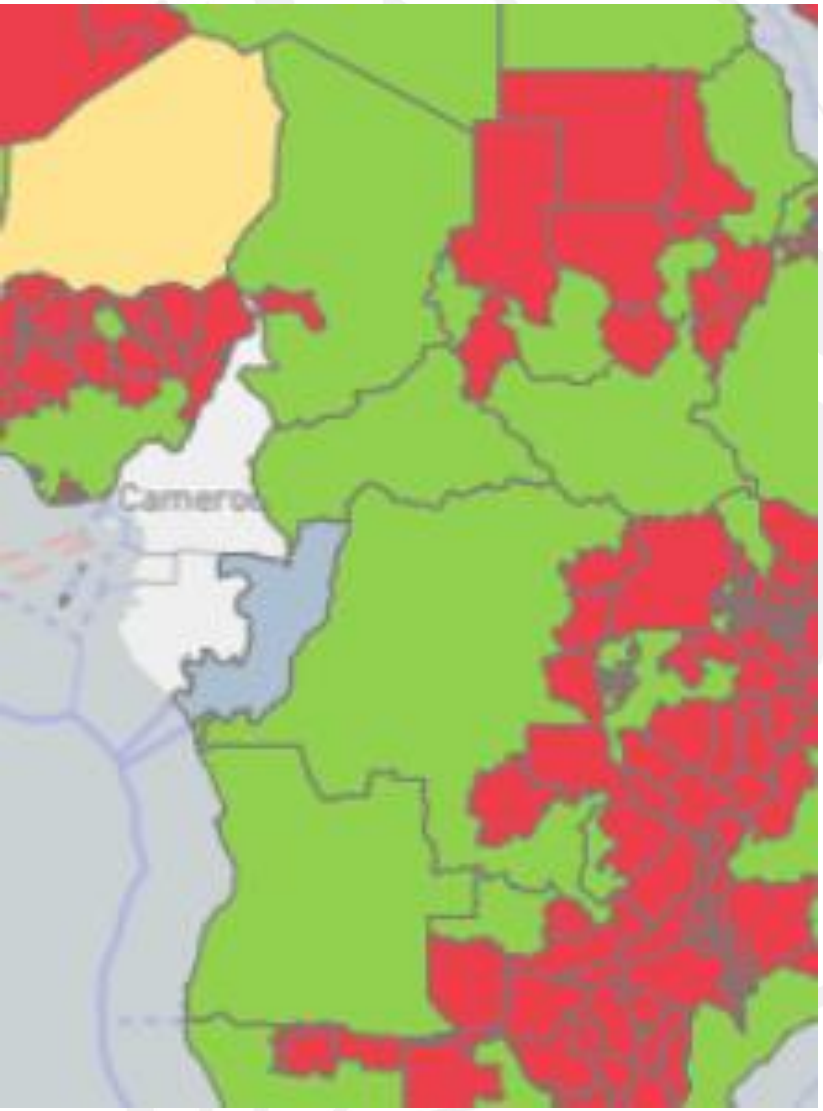
Type O Most prevalent followed by SAT 2, SAT 1 and A

Central Africa (2018-2023)



Disease present in 3 countries

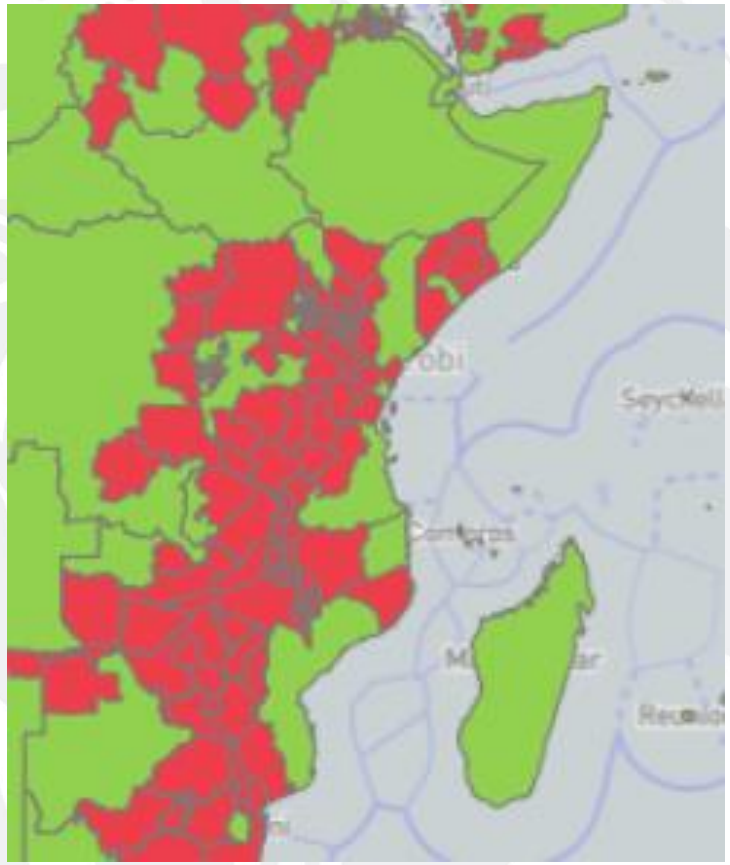
Central African Republic (no type info),
Chad (no type info),
Dem. Rep. of the Congo (A, O, SAT1, SAT2)

Type O likely the most prevalent

as of 01/02/23

No alerts (situation reported as stable)

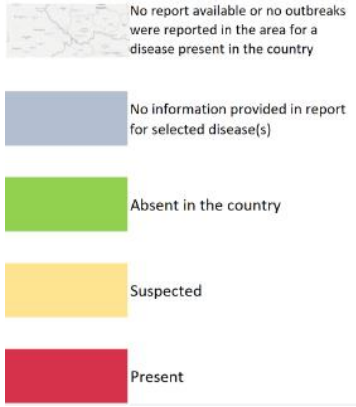
Eastern Africa (2018-2023)



Disease present in 11 countries :

Burundi (no type info),
Comoros (O),
Eritrea (A, O, SAT1, SAT2),
Ethiopia (A, C, O, SAT1, SAT2),
Kenya (A, O, SAT1, SAT2),
Mauritius (O),
Rwanda (no type info),
Somalia (no type info),
South Sudan (Rep. of) (no type info),
Tanzania (A, O, SAT1, SAT2),
Uganda (A, O, SAT1),

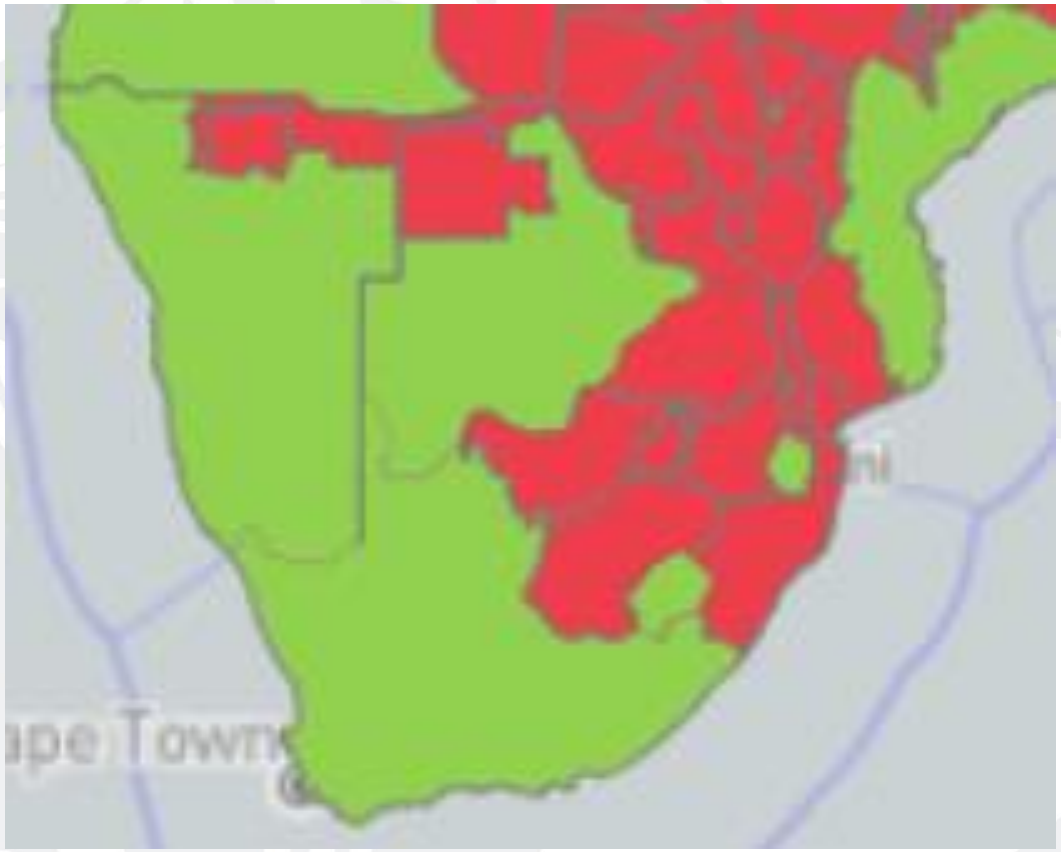
Type O Most prevalent followed by SAT 2, A and SAT 1



Alerts: - *as of 01/02/23*

- Rwanda : recurrences serotype SAT2 in June 2020 **and not typed December 2020**
- **Uganda : new strain (A) in January 2019**

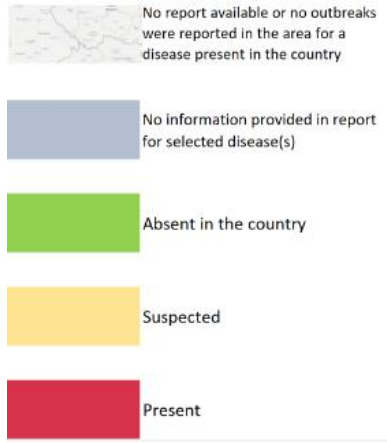
Southern Africa (2018-2023)



Disease present in 8 **countries :**

Botswana (SAT1, SAT2),
Namibia (O, SAT2, SAT3),
South Africa (SAT1, SAT2, SAT3)
Malawi (SAT2),
Mozambique (O),
Zambia (A, O, SAT2),
Zimbabwe (SAT1, SAT2)
Mauritius (O),

SAT 2 most prevalent followed by SAT1, O, SAT 3 and A



Southern Africa - *as of 01/02/23*

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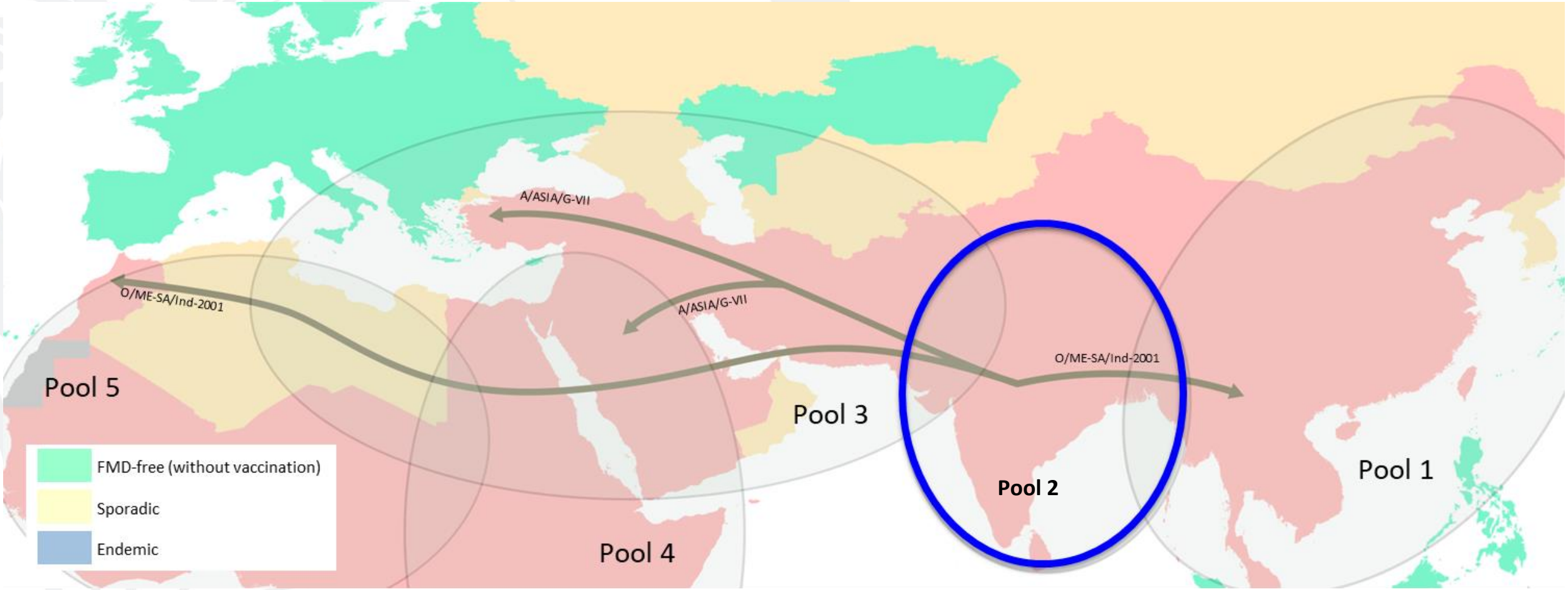
Alerts :

- Botswana : recurrence serotype SAT2 in June 2018, SAT2 in August 2018, SAT1 in September 2020
- Namibia : recurrence SAT3 in August 2019, SAT2 in September 2020, O in June 2021, SAT2 in October 2022
- South Africa : 9 events of which reccurence (no type info) in October 2018, SAT2 in November 2019, SAT1 in September 2020, SAT3 in March 2021, SAT2 in May 20221, SAT3 in March 2022
- Malawi : 8 alerts between 2018 and 2022 (recurrences, new strain, new areas affected) – recurrence (no type info) in July 2022
- Mozambique : 5 alerts between 2018 and 2022 (recurrences, new areas affected) – 4 events still ongoing
- Zambia : recurrences serotype O in March 2018, serotype A in September 2018, SAT2 in December 2020 and not typed in March 2021
- Zimbabwe : 5 alerts between 2018 and 2022 (recurrences, new areas affected) – 3 events still ongoing
- Maurititus : recurrence serotype O in March 2021

Long Distance Trans-Pool Movements into Africa

- **O/ME-SA/Ind-2001d**
- **A/ASIA/G-VII**



Intra and Trans-pool Movements

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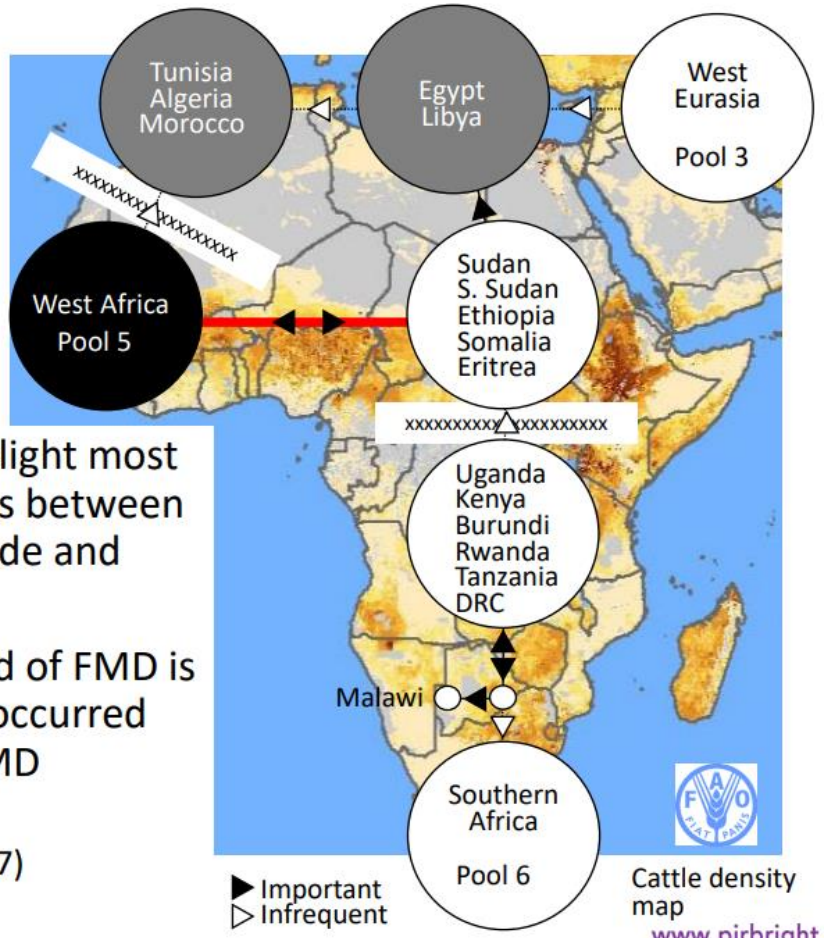
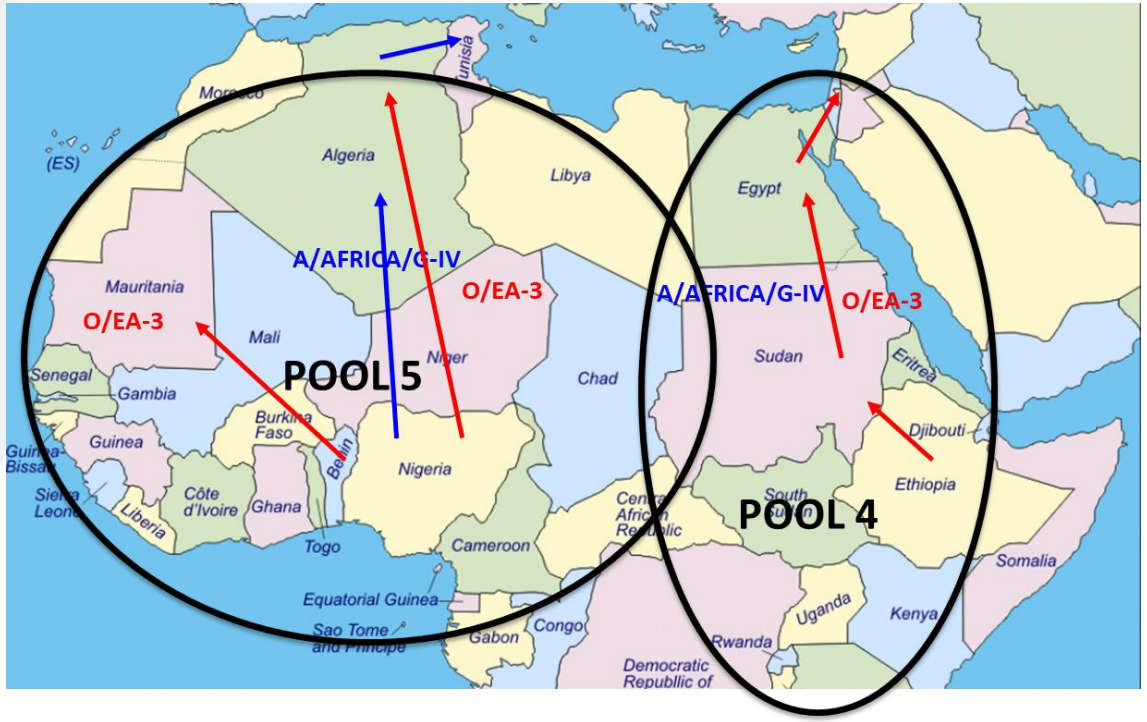
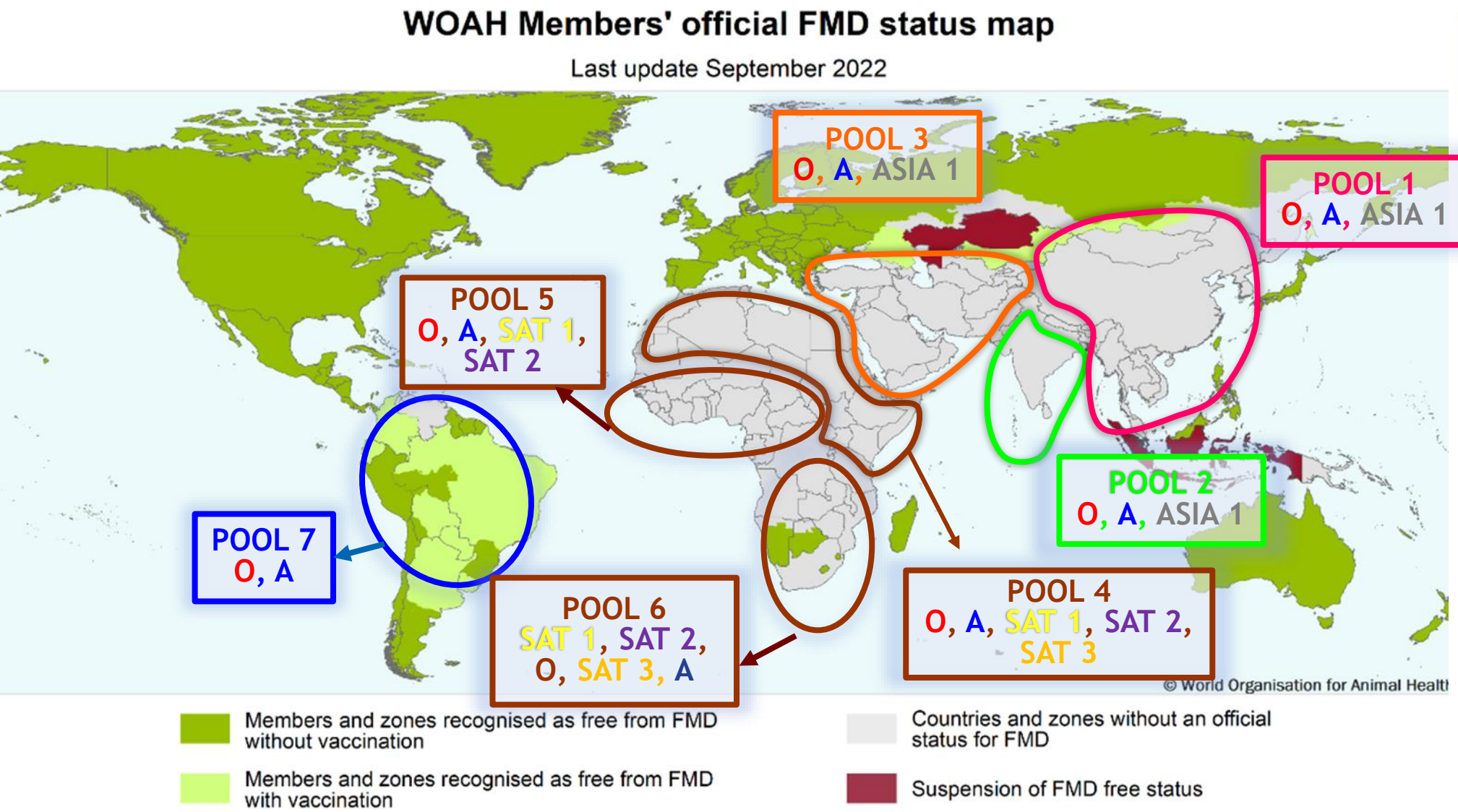
Conjectured FMDV connections within Africa



- Viral sequences highlight most frequent connections between countries (reflect trade and animal movements)
- Trans-Saharan spread of FMD is infrequent (but has occurred recently with two FMD serotypes):
  - A/AFRICA/G-IV (2017)
  - O/EA-3 (2018)



WOAH Members' official FMD status Map



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FMD free where vaccination is not practised :

- Eswatini
- Lesotho
- Madagascar

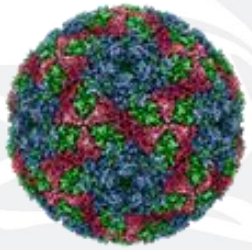
FMD free zone where vaccination is not practiced

- Botswana (suspension zone-6B)
- Namibia

Endorsed official control programme for FMD

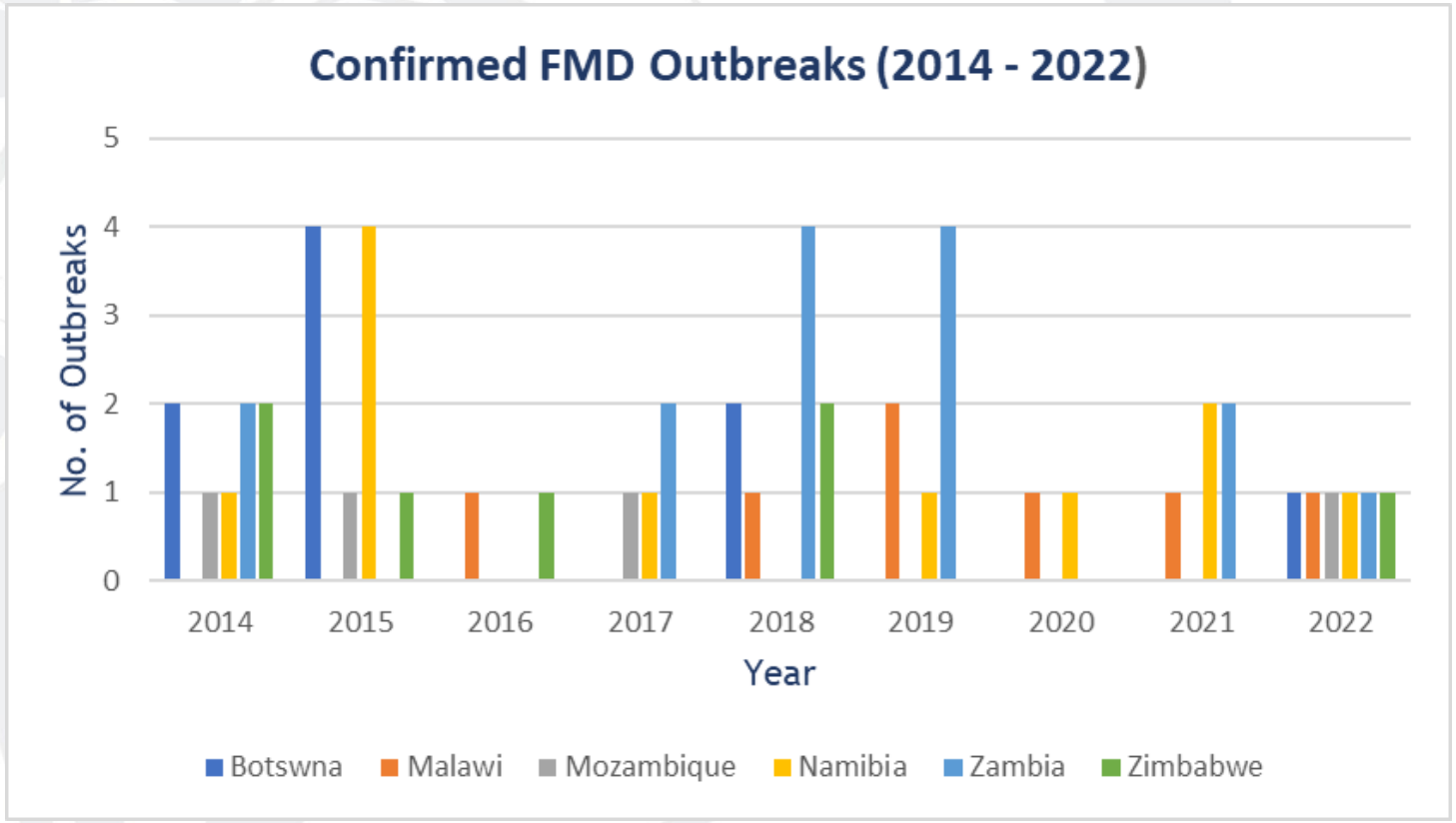
- Botswana
- Morocco
- Namibia

https://www.woah.org/en/disease/foot-and-mouth-disease/#ui-id-2



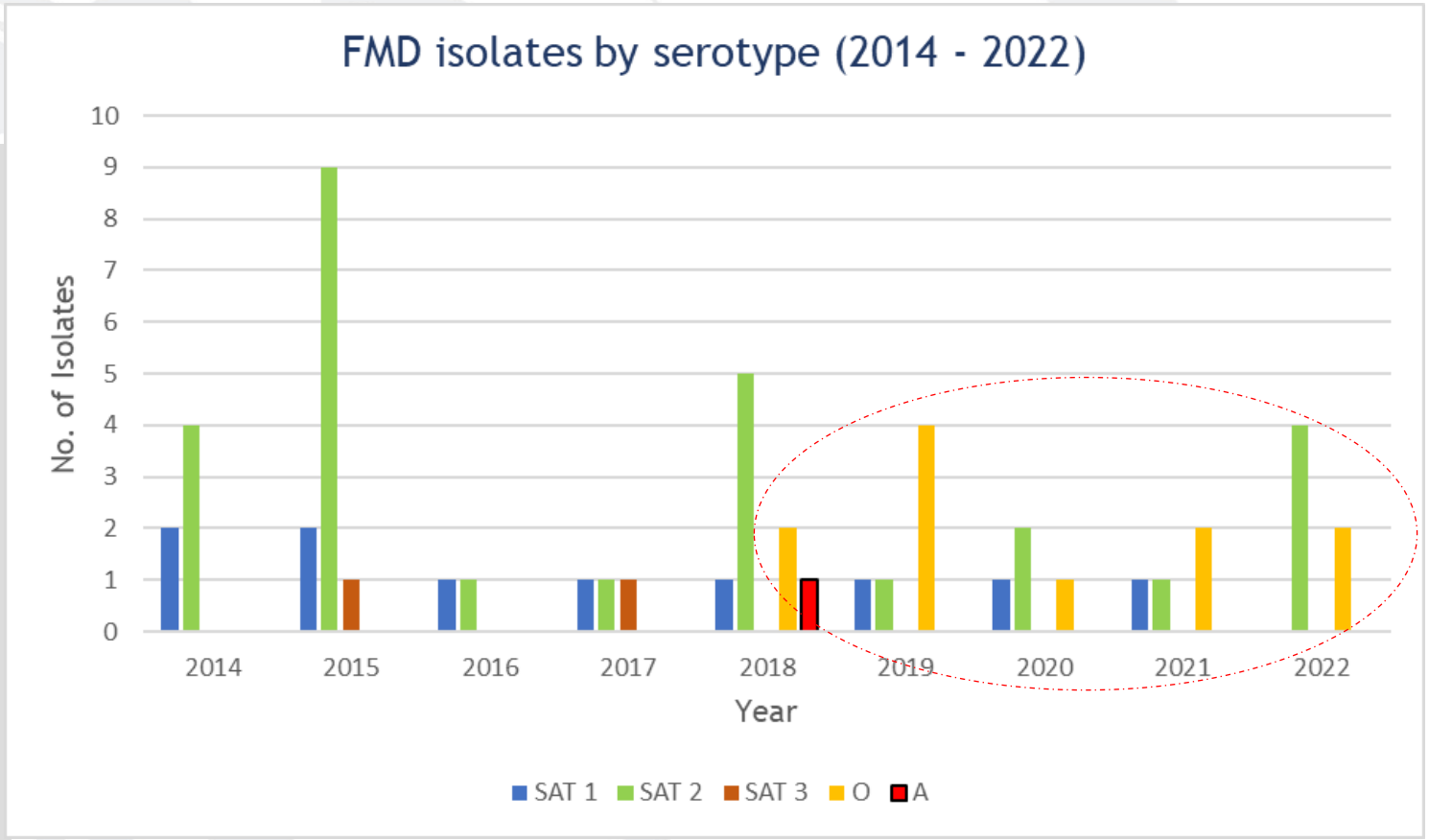
FMD Situation in Southern Africa

FMD Outbreaks Southern Africa (2014 – 2022)



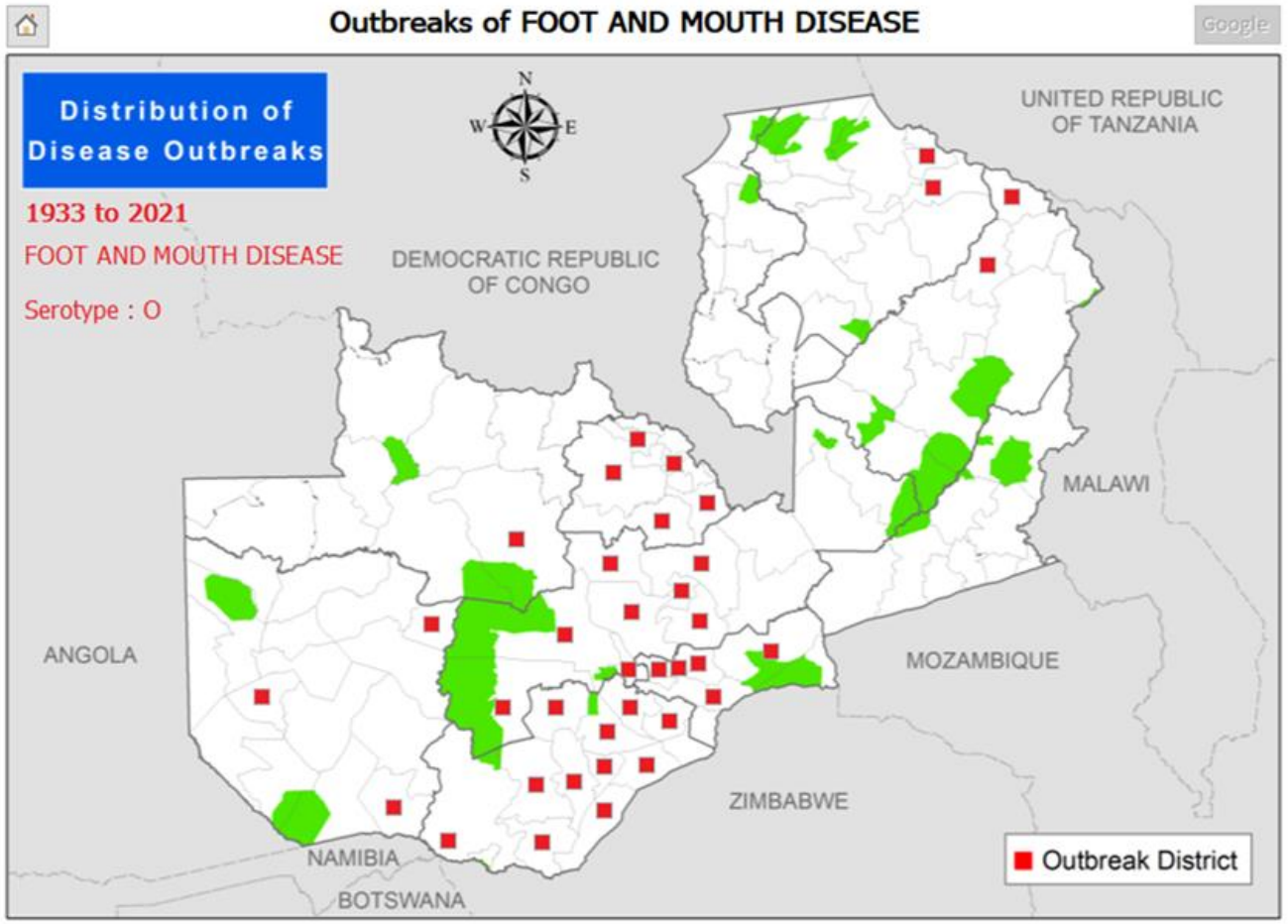
- Only outbreaks confirmed by the WOAH Reference Laboratory hosted at BVI are indicated.
- Confirmation by: Virus Isolation and typing by antigen ELISA
- Data does not include number of cases or secondary outbreaks
- Outbreaks reported in South Africa not depicted.
- Situation in Angola not clear

FMD Serotypes prevalent in Southern Africa



- 5 of the 7 known FMD serotypes circulate in the region.
- SAT 2 still remains the predominant serotype.
- SAT 3 reported in Namibia (2015) and Zambia (2017)
- First ever recorded case of Type O (O/ME-SA/PanAsia) was in Kwazulu-Natal, South Africa in September 2000
- Since 2018, four (4) countries in the region have reported Type O so far.

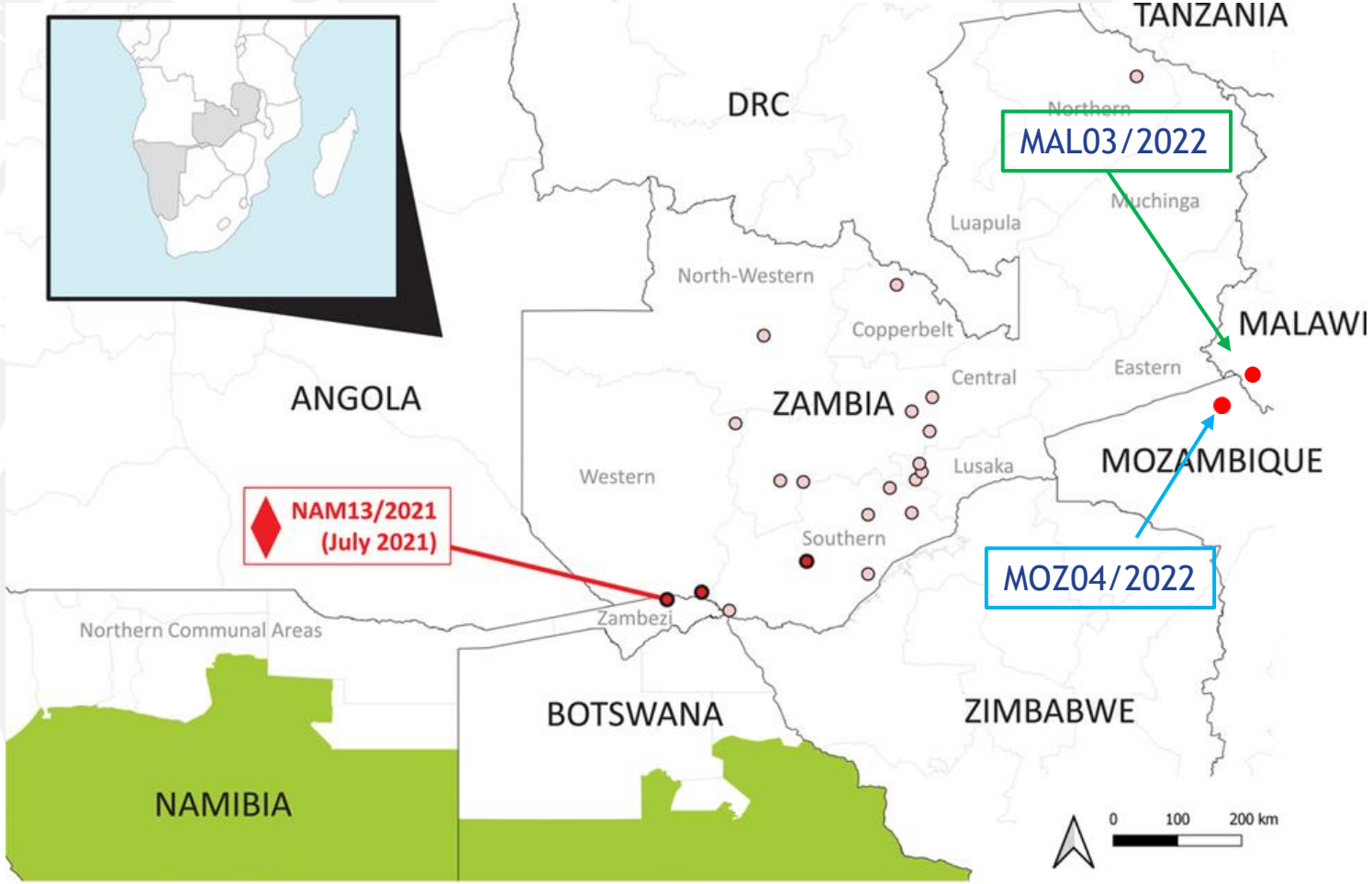
Incursion of FMD Type O into Southern Africa



- Primary outbreak was detected in Chisamba district, Northern province in April 2018
- Virus was typed as Type O (Topotype EA-2) by both BVI and WRLFMD
- By 2019 the virus had reached Monze & Mazabuka districts in the southern province
- Through 2019 to 2020 the virus had spread to most provinces (Central, copperbelt, Lusaka & western)
- The virus eventually reached the Kazungula district around March 2020

NB: Prior to 2018, outbreaks due to serotype O were restricted to the northern province of Zambia (Banda et al)

Type O spread into Namibia, Malawi and Mozambique



- Reports of incursion in Namibia were in June 2021.
- Sequences shared closest nucleotide identity (99.5%) to FMDV isolates collected from western Zambia
- Malawi confirmed infection with serotype O in March 2022 in Mchinji district.
- Mozambique confirmed infection with Serotype O in May 2022

Phylogenetic relationships

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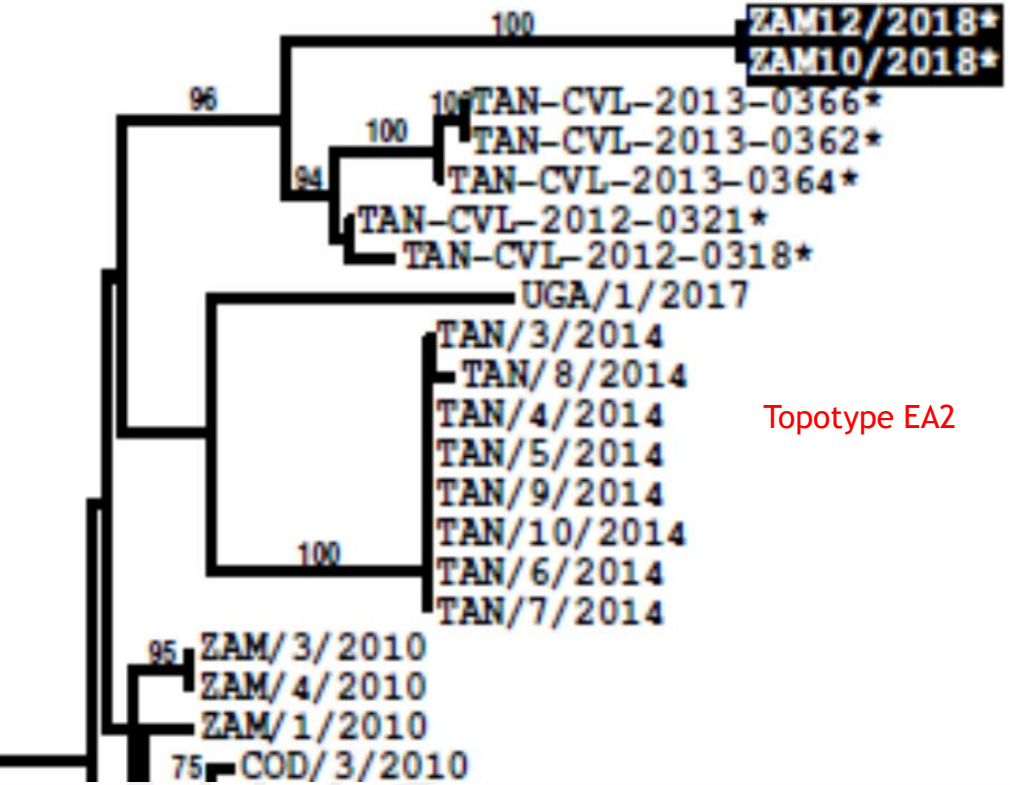
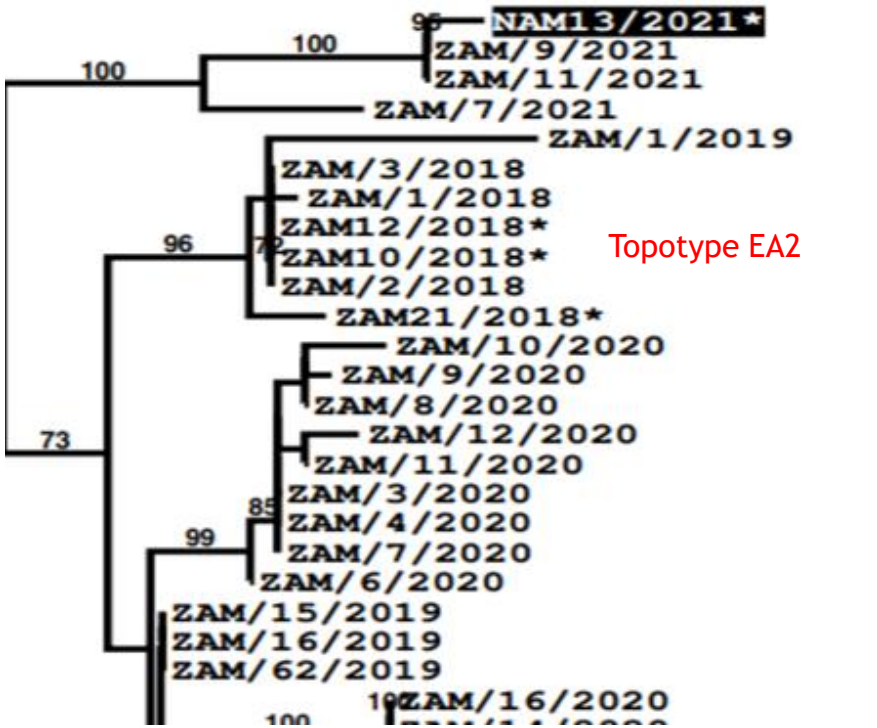
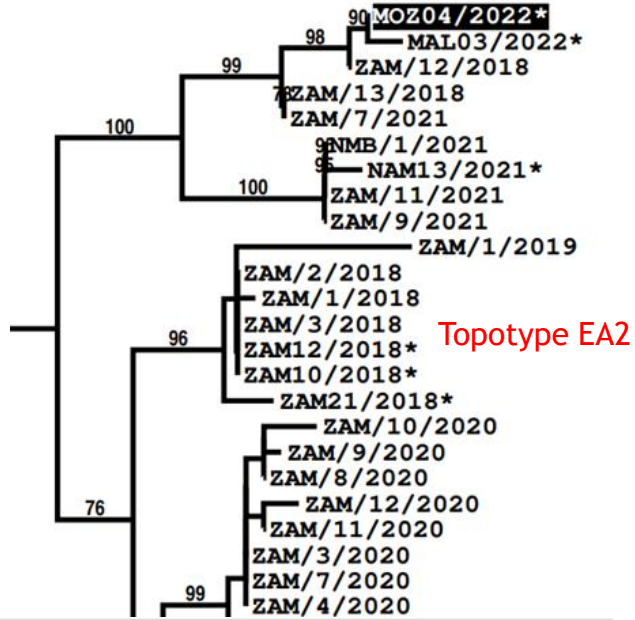
Zambia Isolates 2018



Namibia Isolates 2021



Mal & Moz Isolates 2022



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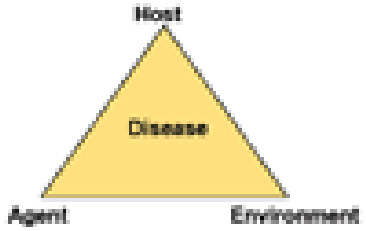
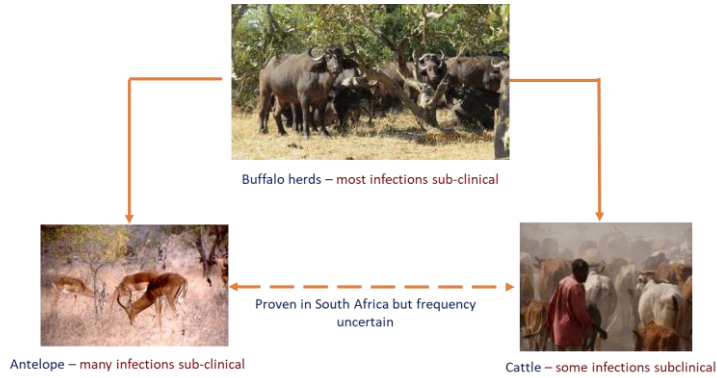
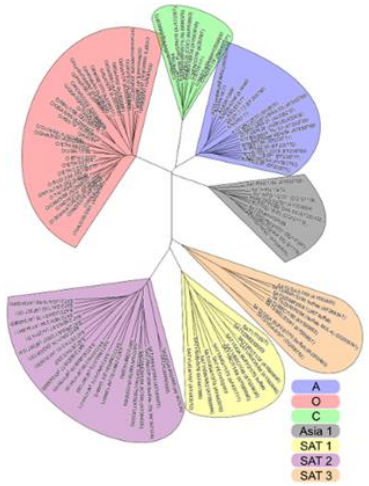


Epidemiological Changes and Concerns

- Involvement of wildlife in the epidemiology of FMD in Africa makes it very difficult to manage
- 5 (O, A, SAT 1, 2 & 3) of the seven FMDV are present in Africa, but their distribution varies.
- The broad genetic diversity (>60 strains within the 7 serotypes), requires constant assessment of vaccine suitability.
- Transhumance and illegal movement of livestock across borders
- Poor performance of prophylactic vaccination programmes
- Low submission of samples to WOAH reference laboratories
  - Difficulty in transportation of samples to reference laboratories





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Way forward and Conclusions

- There is need for a coordinated continental approach (GF-TADs & FMD PCP) in the control and management of FMD in Africa
  - Strengthening Veterinary Services (WOAH PVS tool)
  - Surveillance and early warning systems (WAHIS)
  - Diagnostics (WOAH/FAO laboratory network)
- The incursion of type O in southern Africa requires urgent attention
- Coordination/Synchronisation of vaccination programs across border areas
- Facilitation of trade in animals and animal products for communities living across border areas
- Facilitation of FMD samples across borders to WOAH reference laboratories
- Creation of a continental or regional vaccine/antigen banks

Cross-border meeting: Chingola, Zambia, 2011

Acknowledgements

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THANK YOU FOR YOUR ATTENTION