



The role of Botswana Vaccine Institute
WOAH Reference
Laboratory for FMD in supporting FMD
control activities in Africa

M. Mokopasetso

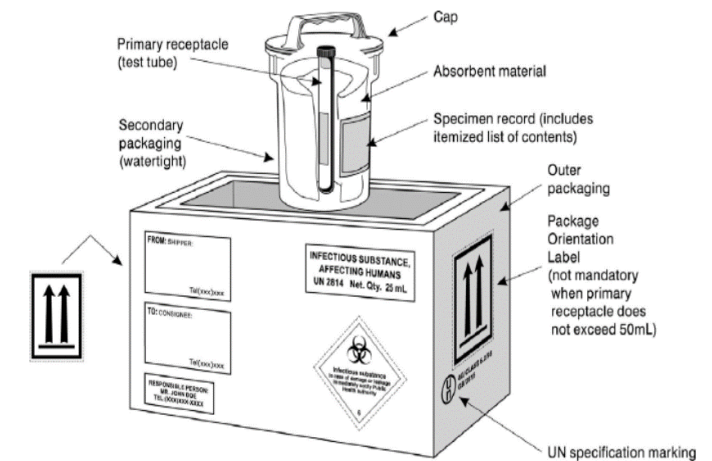
PROVIDING SUSTAINABLE ANIMAL HEALTH SOLUTIONS

BVI Technical Support Services



Diagnostic Services

- ✓ BVI has hosted the OIE regional reference laboratory for FMD since 1985
- ✓ The laboratory provides the following services:
 - ✓ Confirmatory diagnosis of FMD (VI, PCR, ELISA)
 - ✓ Participation in PTs organised by WRL since 2012
 - ✓ Laboratory Technical Support (on the bench training)
 - ✓ 2 scientists, Mozambique (2018) & 4 scientists, Namibia (2022)
 - ✓ Testing of Post Vaccination Sero-monitoring samples (Joint testing)
 - ✓ Supply of reference reagents (guineapig & rabbit antisera, negative & positive control sera, purified FMD antigen)



BVI Technical Support Services



Field Technical Support Services

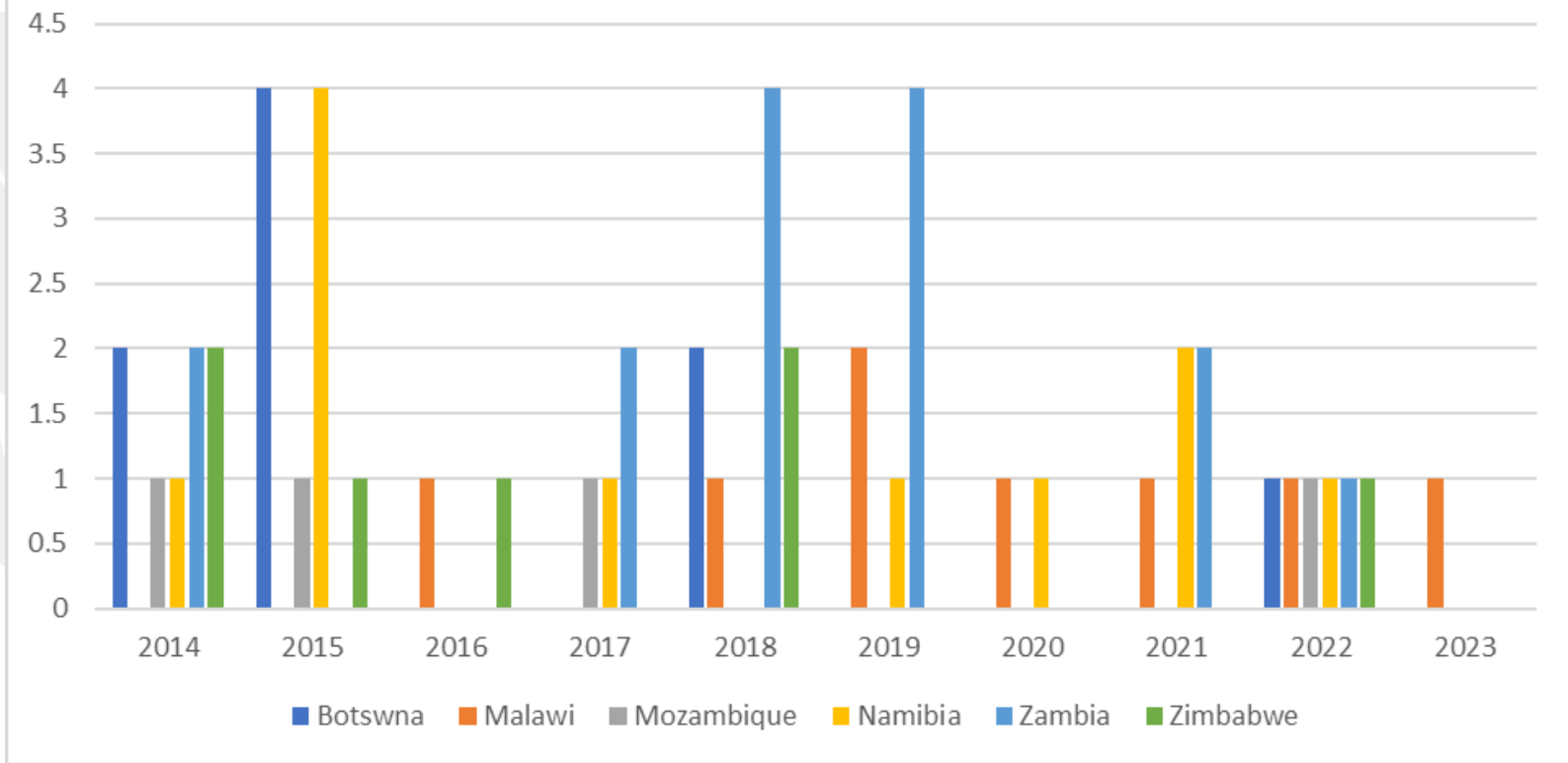
- ✓ Joint outbreak investigation
- ✓ Sample collection and transport to the OIE laboratory
- ✓ Strategy formulation for outbreak control
- ✓ Design and Implementation of Post Vaccination Sero-monitoring Studies



Confirmed FMD Outbreaks by Country (2014 - 2023)



Confirmed FMD outbreaks by Country (2014 - 2023)

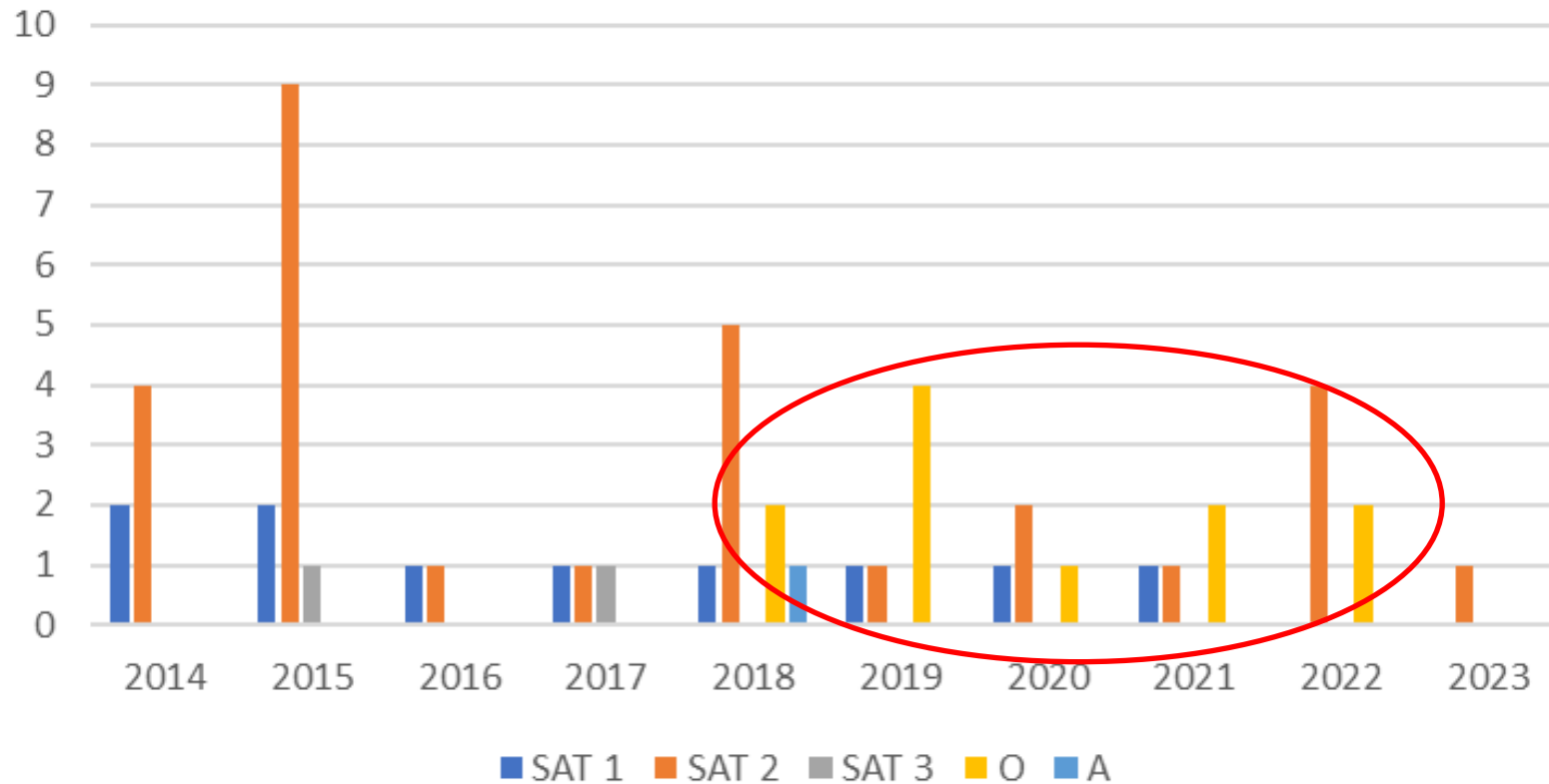


- Only outbreaks confirmed by the WOAHA Reference Laboratory hosted at BVI are indicated.
- Confirmation by: Virus Isolation and typing by antigen ELISA
- Data does not include number of cases or secondary outbreaks
- Outbreaks reported in South Africa not depicted.
- Situation in Angola not clear

Confirmed FMD Outbreaks (2014 - 2023)

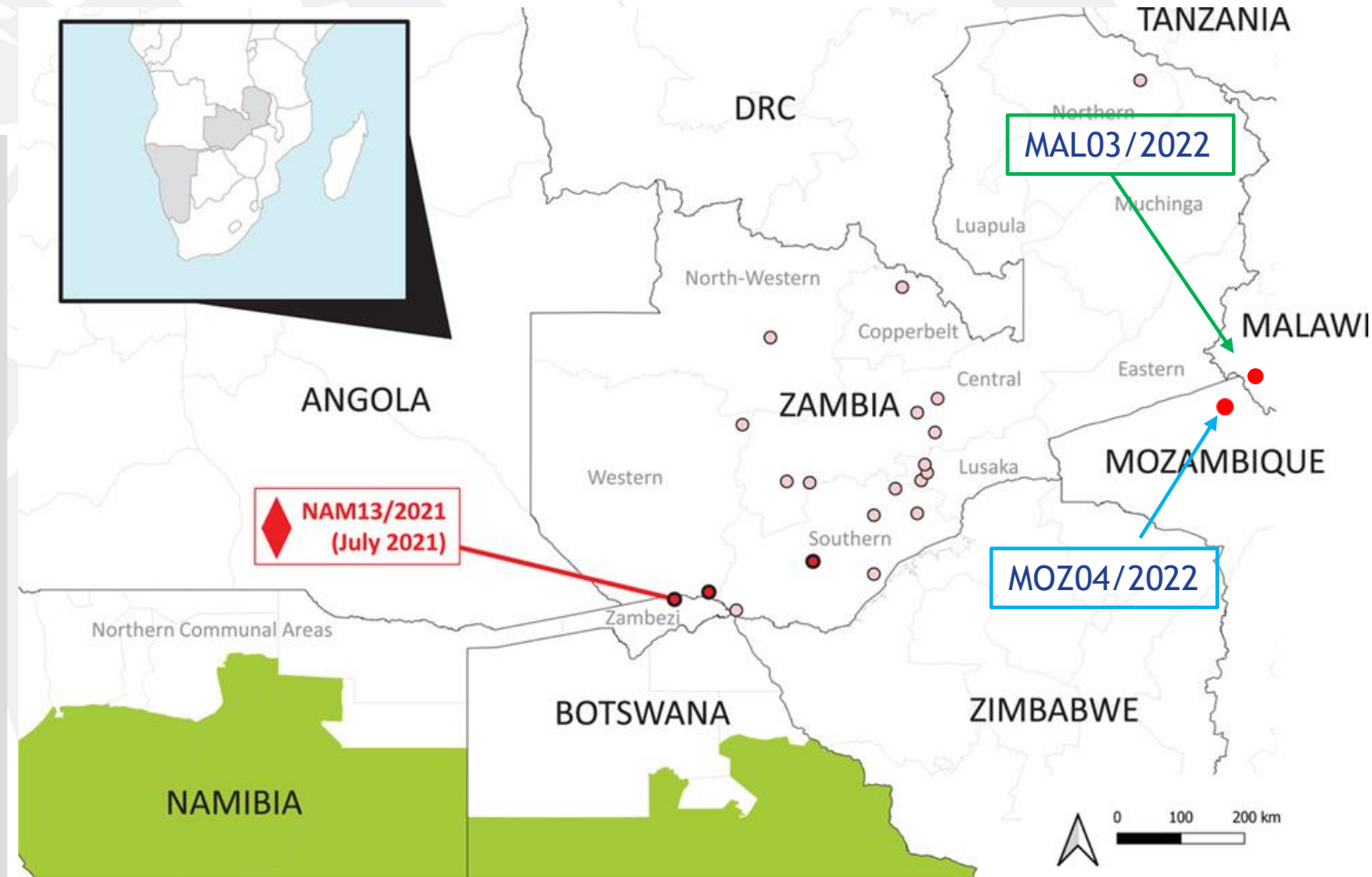


FMD Isolates by serotype (2014 - 2023)



- ❑ 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)
- ❑ Type O has historically been confined to the northern province of Zambia.
- ❑ Since 2018, four (4) countries in the region have reported Type O so far.

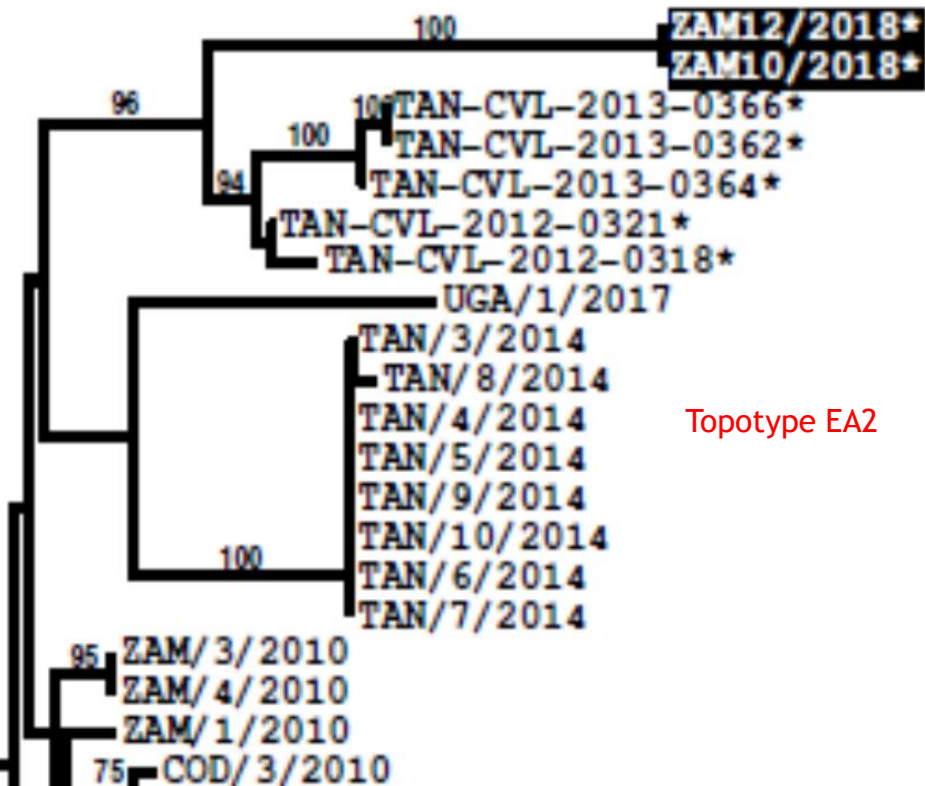
Type O outbreaks (Zambia, Namibia, Malawi and Mozambique)



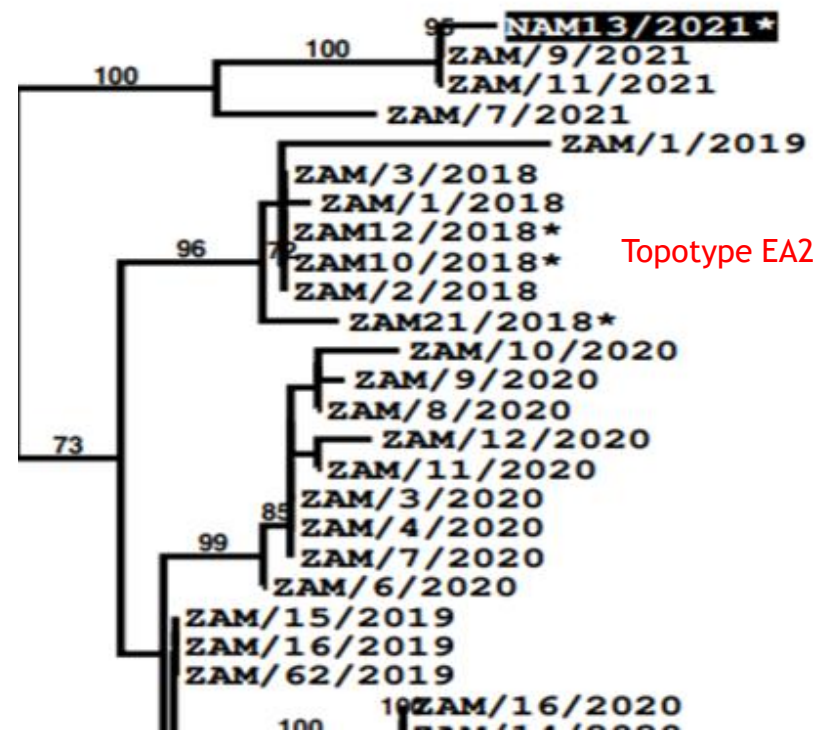
- ❑ Reports of incursion in Namibia were in June 2021.
- ❑ Sequences shared closest nucleotide identity (99.5%) to FMDV isolates collected from western Zambia
- ❑ Malawi confirmed infection with serotype O in March 2022 in Mchinji district.
- ❑ Mozambique confirmed infection with Serotype O in May 2022

Phylogenetic relationships

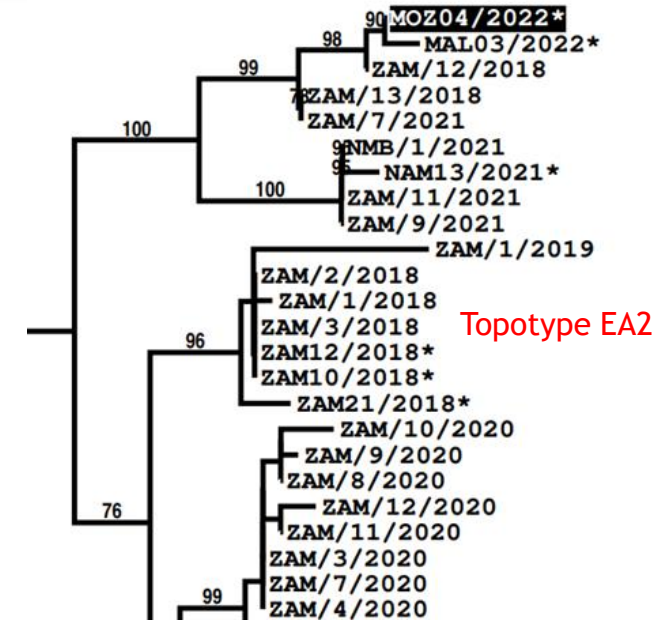
Zambia Isolates 2018



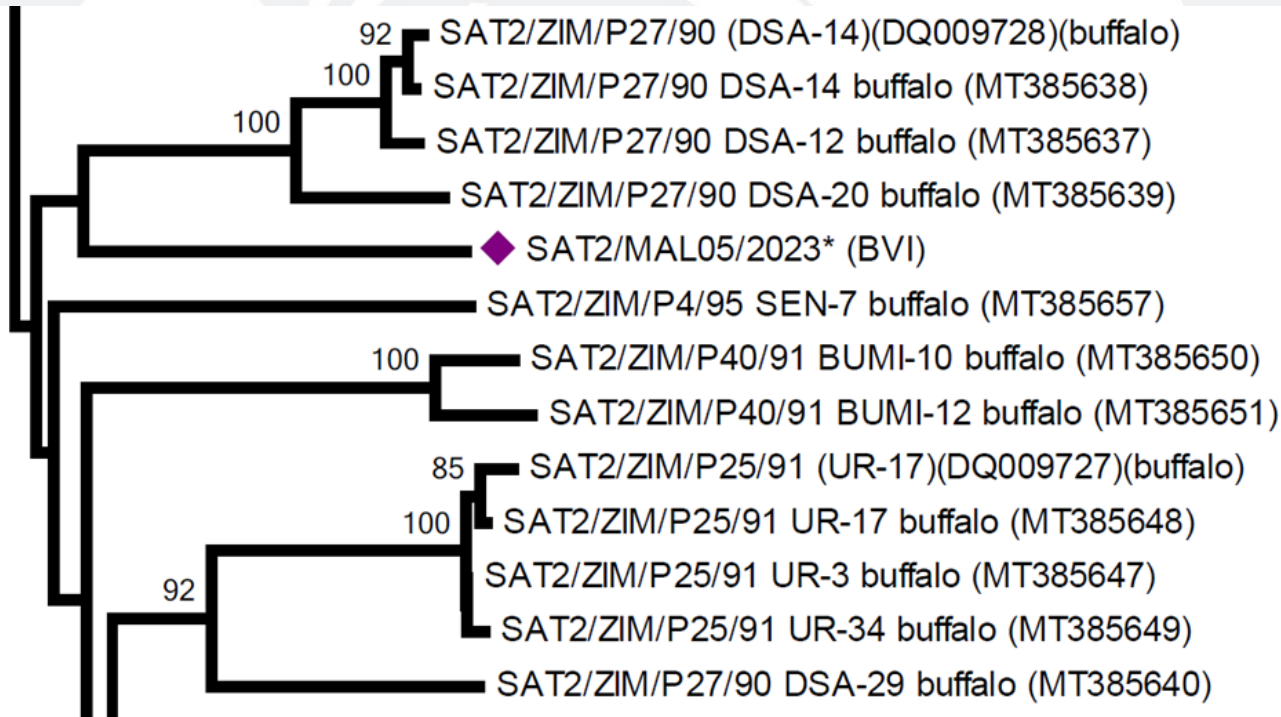
Namibia Isolates 2021



Mal & Moz Isolates 2022



Malawi SAT 2 outbreak : 2023



VACCINE MATCHING REPORT (VMR)

Lab Reference: BVI.SSRRLFMD 09/2023

Country of Origin: Malawi

Field virus isolate(s)	2dmVNT ¹ (r1 values)	
	r1 value per Vaccine virus strain	
	SAT 2035	SAT 251
SAT2/MAL 05/2023	0.82	0.65

¹Two dimensional Virus Neutralization Test; r = relationship coefficient.

Vaccine Matching – Type O



- ✓ Two Dimensional Virus Neutralisation Test results for recent type O isolates from the region.

Field Virus Isolate	r value per vaccine virus strain	
	O-Manisa	O-3039
O/NAM/6/2021	0.52	0.38
O/MAL/5/2022	0.85	0.22

$$r1value = \frac{\text{Titer of antibodies of the vaccine serum against the field virus (heterologous)}}{\text{Titer of antibodies of the vaccine serum against the vaccine virus (homologous)}}$$

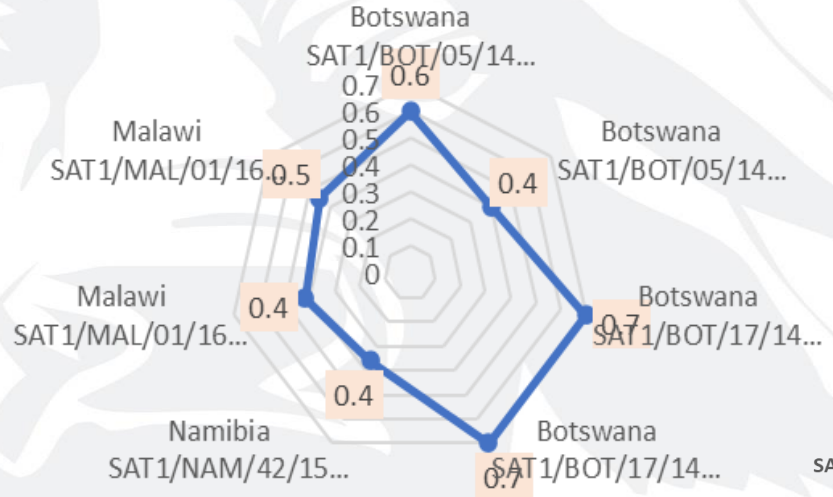
Interpretation

- ✓ Values ≥ 0.3 indicate that the field strain is sufficiently similar to the vaccine strain and use of the vaccine is most likely to confer against the field strain
- ✓ Values < 0.3 indicate a significant difference between the field strain and the vaccine strain and the vaccine is less likely to confer protection.

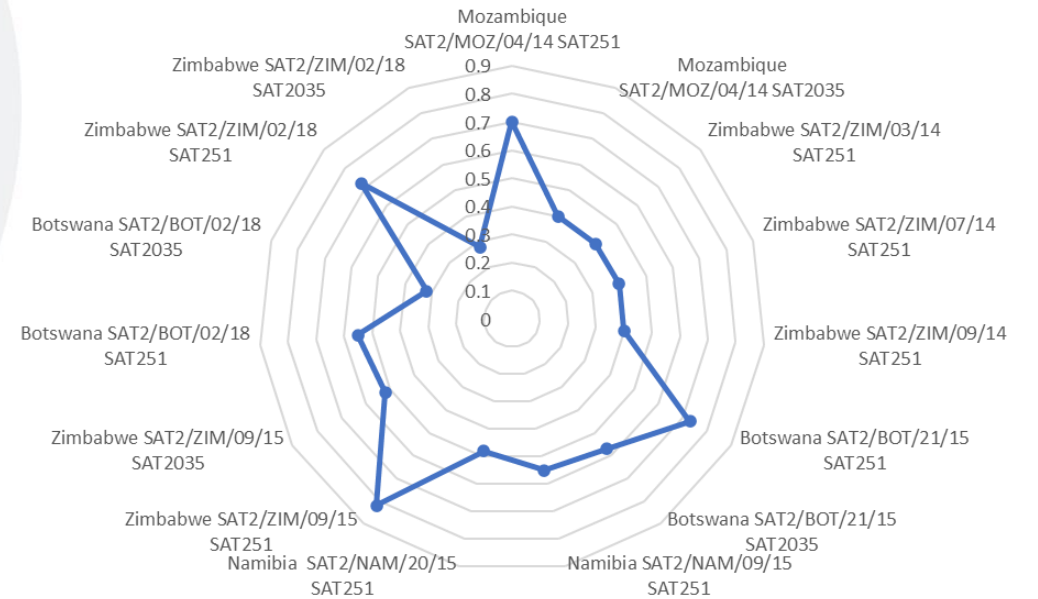
Vaccine Matching – SAT 1, 2 & 3



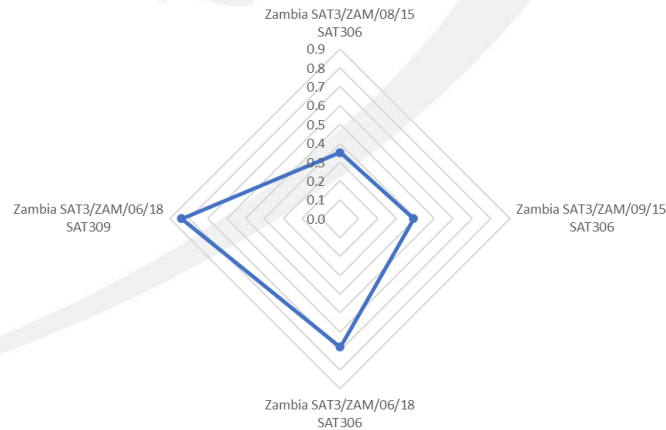
SAT1 Vaccine Matching(2014 - 2020)



SAT2 Vaccine Matching (2014 - 2020)



SAT3 Vaccine Matching (2014 - 2020)



Way forward and Conclusions

- ❑ A coordinated regional approach in the control of FMD is a necessity
- ❑ 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 WOAHA reference laboratories
- ❑ Creation of a continental or regional vaccine/antigen banks
- ❑ Countries to continue to adopt and use tools availed by the FAO/WOAH within the GF-TADs Framework such as:
 - ❑ PVS tool
 - ❑ FMD-PCP





**THANK YOU
FOR
YOUR ATTENTION**

