FMD Serotype O in KAZA Implications and Options

KAZA Animal Health Sub-Working Group
Meeting: 17 – 18- Nov 2021

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BVI

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PROVIDING SUSTAINABLE ANIMAL HEALTH SOLUTIONS

OUTLINE

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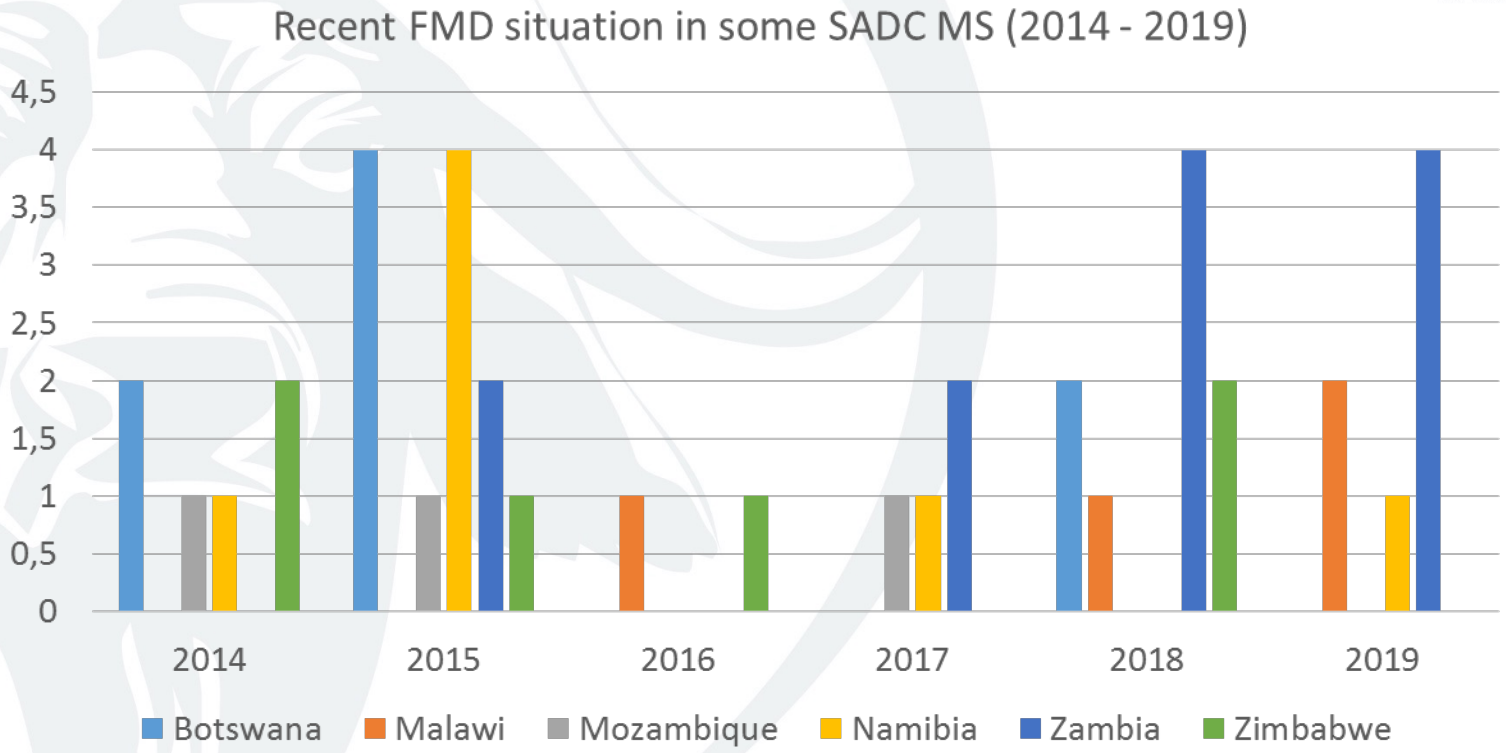
1. Historical FMD outbreaks
2. Incursion of Serotype O
3. Implications
4. Options for Management of type O
5. Vaccine Availability
6. Conclusion

1. Historical FMD Outbreaks (2014 – 2019)



What about Angola…???

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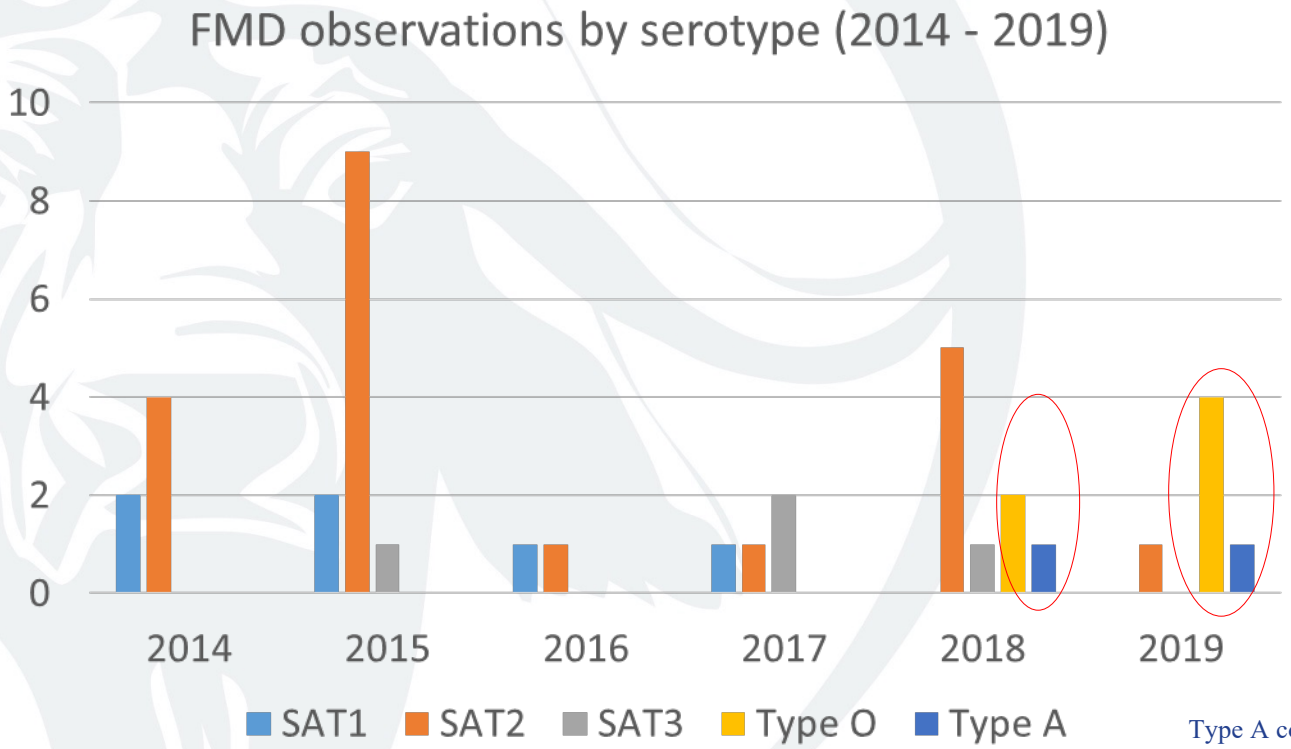

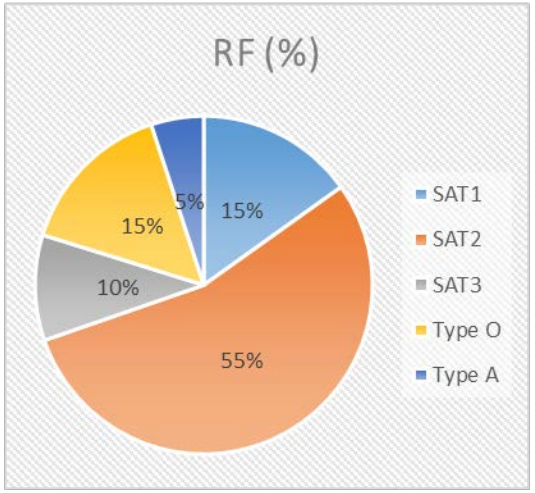

Type A confirmed by WRLFMD, Pirbright Institute, UK

- Serotype SAT 2 has been the most prevalent
- Serotype O increasingly becoming problematic

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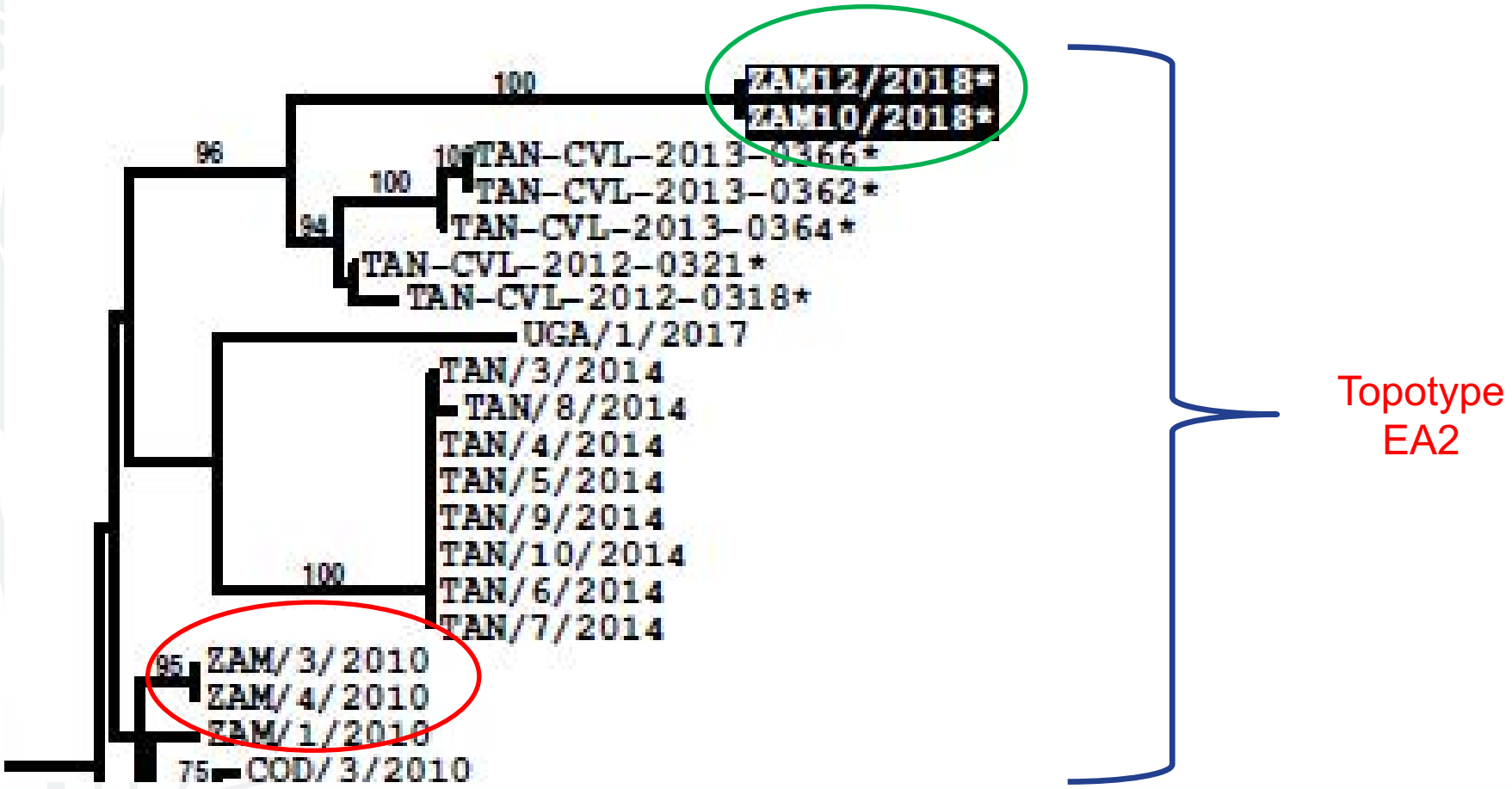
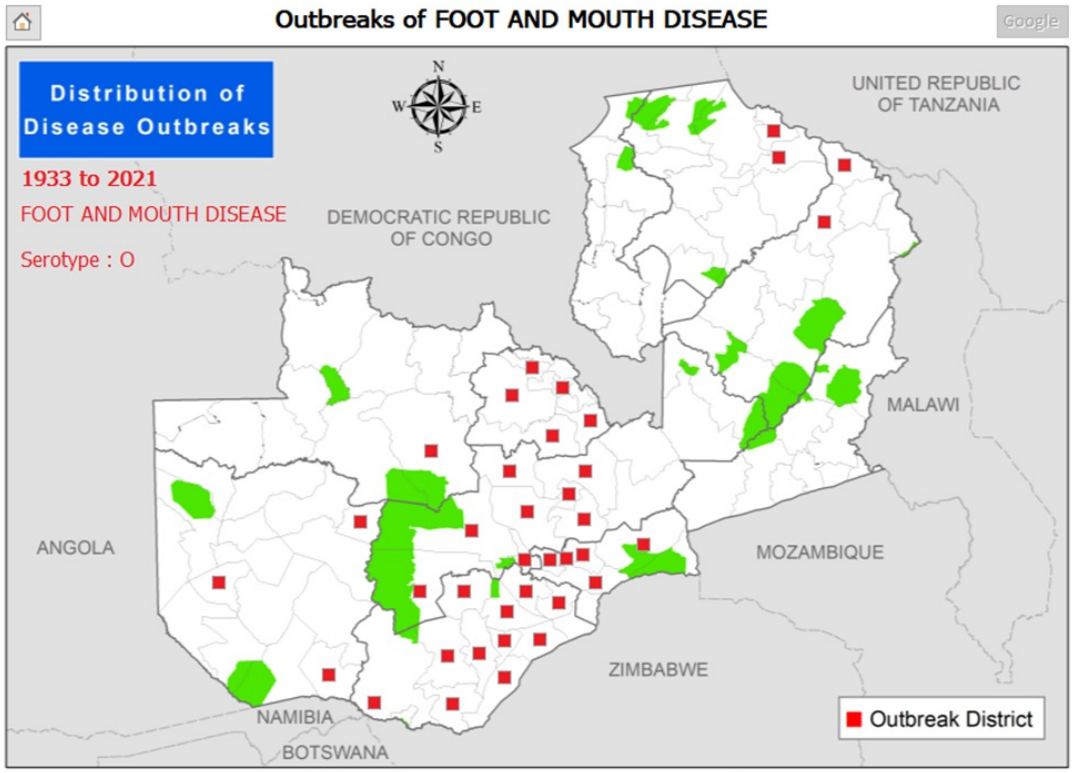
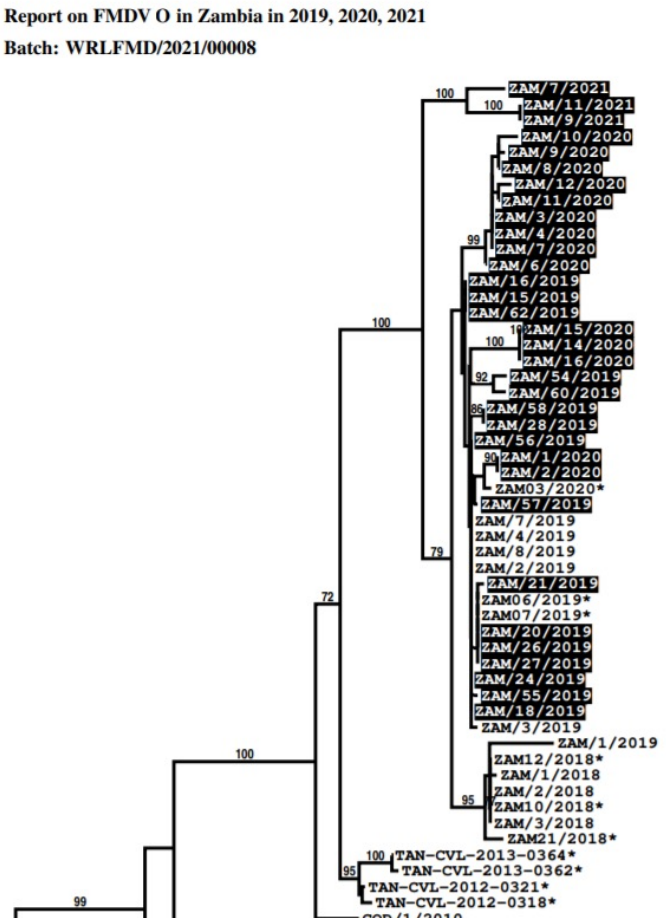
2. Incursion of Serotype O

- In April 2018, Type O was isolated from samples received from Zambia



Current distribution of Type O in Zambia





- Accelerated progression between 2018 & 2021
- What happened???

- Inevitable overspill into Namibia in 2021
- Trade related movement could be the cause??

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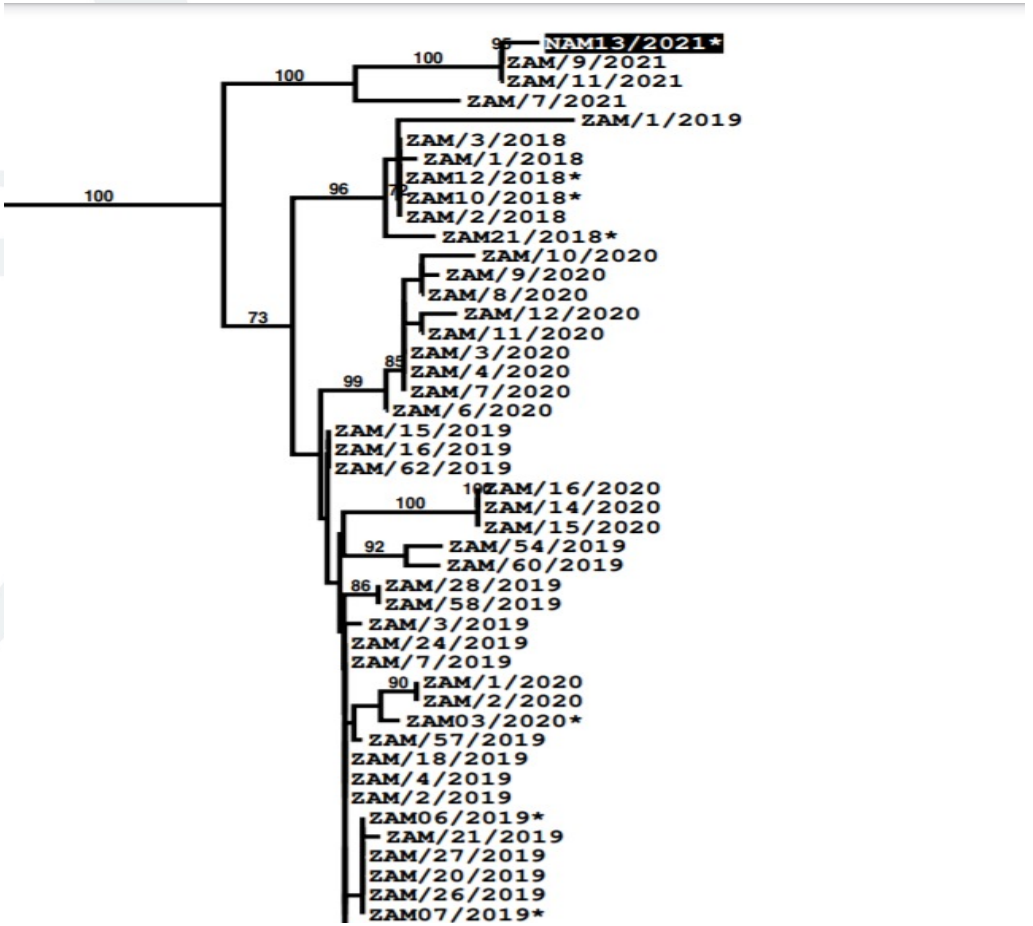

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3. Serotype O: Implications

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what we know…

- A highly contagious serotype (very high morbidity)
- Aggressive, debilitating clinical presentation
- Production costs can be quite high (up to 25% loss in milk production and 20% in weight gain)
- Sheep, Goats and Pigs "may" play a significant role
- African Buffalo not yet implicated as reservoir

Likely implications.....

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- The disease will likely spread into countries neighbouring Zambia and Namibia
- Routine vaccination programs will need to take into account the new variant (monovalent or multivalent vaccine combinations??)
- Are available vaccine strains relevant for the new variant?
- Pressure on vaccine producers to meet individual country requests (what about antigen/vaccine banks???)

4. Options for management of type O

- Do nothing
- Stamping out
- Modified Stamping out
- Vaccination
- Movement control

5. Vaccine Availability

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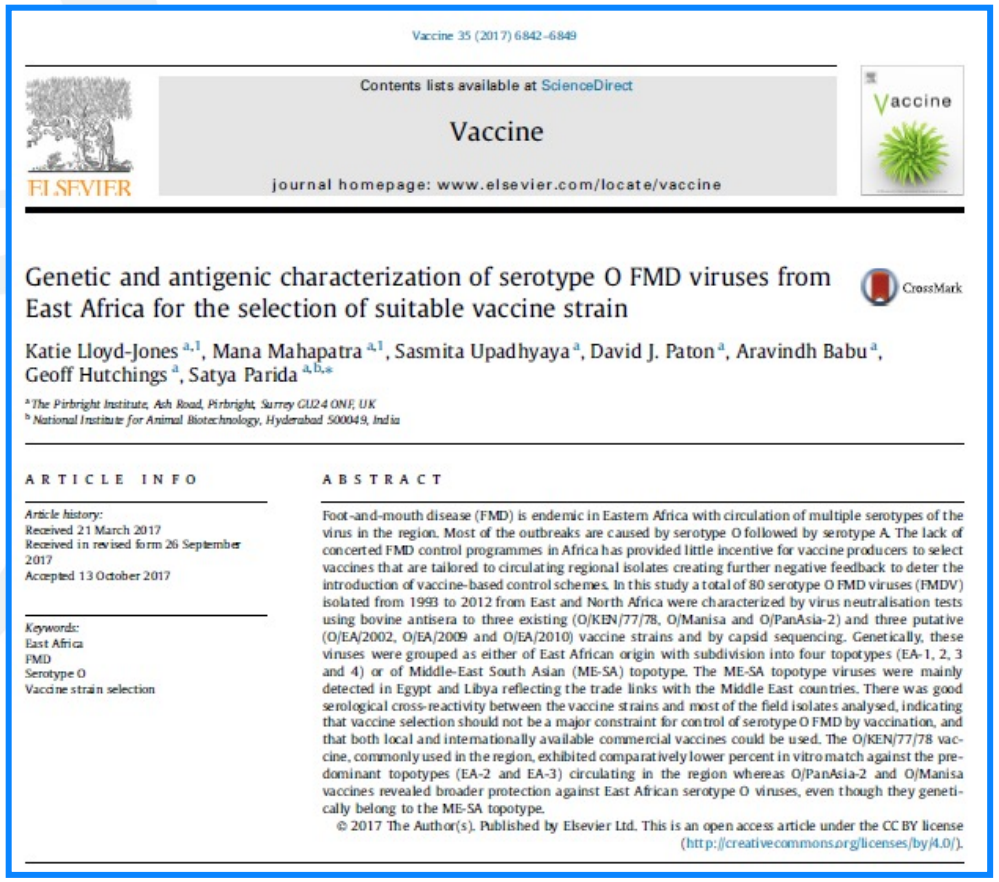
- Fortunately relevant vaccine strains are available
- These strains have a proven record of good protection against the EA2 topotype

Field isolate	Vaccine Strain	R-value
O/NAM/6/2021	O-manisa	0.52
	O-3039	0.38



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Genetic and antigenic characterization of serotype O FMD viruses from East Africa for the selection of suitable vaccine strain

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ABSTRACT

Foot-and-mouth disease (FMD) is endemic in Eastern Africa with circulation of multiple serotypes of the virus in the region. Most of the outbreaks are caused by serotype O followed by serotype A. The lack of concerted FMD control programmes in Africa has provided little incentive for vaccine producers to select vaccines that are tailored to circulating regional isolates creating further negative feedback to deter the introduction of vaccine-based control schemes. In this study a total of 80 serotype O FMD viruses (FMDV) isolated from 1993 to 2012 from East and North Africa were characterized by virus neutralisation tests using bovine antisera to three existing (O/KEN/77/78, O/Manisa and O/PanAsia-2) and three putative (O/EA/2002, O/EA/2009 and O/EA/2010) vaccine strains and by capsid sequencing. Genetically, these viruses were grouped as either of East African origin with subdivision into four topotypes (EA-1, 2, 3 and 4) or of Middle-East South Asian (ME-SA) topotype. The ME-SA topotype viruses were mainly detected in Egypt and Libya reflecting the trade links with the Middle East countries. There was good serological cross-reactivity between the vaccine strains and most of the field isolates analysed, indicating that vaccine selection should not be a major constraint for control of serotype O FMD by vaccination, and that both local and internationally available commercial vaccines could be used. The O/KEN/77/78 vaccine, commonly used in the region, exhibited comparatively lower percent in vitro match against the predominant topotypes (EA-2 and EA-3) circulating in the region whereas O/PanAsia-2 and O/Manisa vaccines revealed broader protection against East African serotype O viruses, even though they genetically belong to the ME-SA topotype.

Positioning BVI for the Future by 2023

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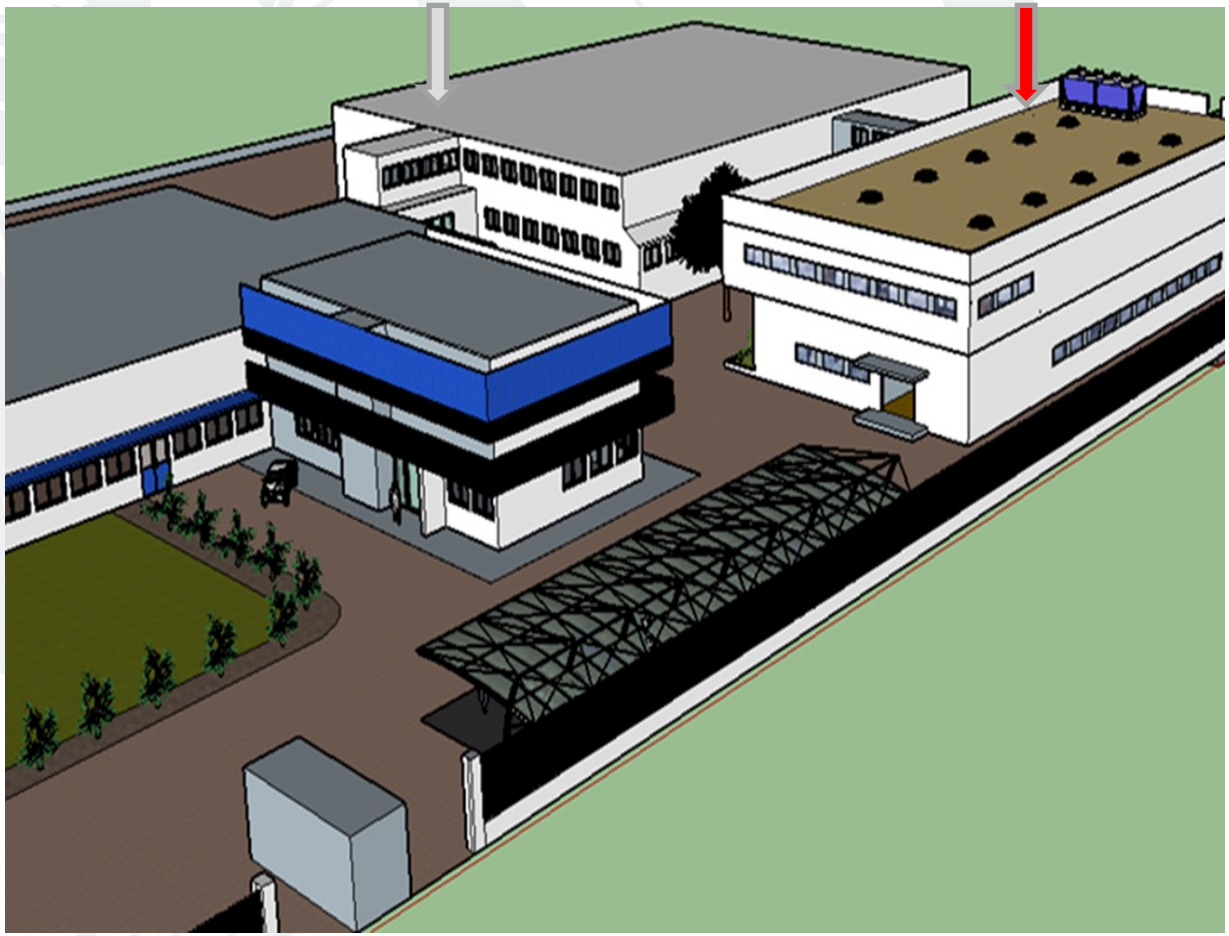
Existing FMD Production lab

Proposed Blending and Filling lab



- Allow BVI to have GMP certification for full FMD Production Process (Open Up New Markets)
- Allows BVI to blend and bottle other forms of existing products as well as new product lines
- Increase storage facilities of finished products

Conclusion

- **A regional approach is required to manage the spread of serotype O**
  - Coordination / synchronisation of vaccination programs at border areas
  - Facilitation of trade across communities living along boarder areas
  - More involvement of stakeholders in animal movement and disease management
  - Creation of a regional vaccine/antigen bank

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THANK YOU
FOR
YOUR ATTENTION

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