





## The FMD CORUS Project Year 1

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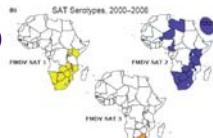
## Development of an epidemiological network for monitoring the dynamics of Foot and Mouth Disease within the GLTFCA


## General objectives of CORUS

- to encourage **training** for and by **research**
- to stimulate exchange and **collaboration** between countries of the Southern and Northern Hemispheres
- to fund high **quality scientific research** to promote development

## Justification of CORUS FMD Project



- High level of risk in the GLTFCA.
- Important gaps of information of FMD dynamics
- Important ongoing projects in the region (SADC FMD, TAD FAO Programme)

➔ Need to create a regional network of partners working on FMD in that particular area

## Specific objectives of the CORUS FMD Project



- contribute to development of epidemiological tools to understand disease dynamics
- provide training opportunities and scientific support to facilitate capacity building
- create a network to facilitate exchange of information about FMD surveillance, epidemiology and control

## Partners CORUS FMD Project



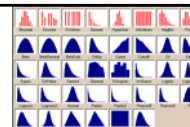
- CIRAD
  - F. Jori (UP)
  - A. Caron (Zimbabwe)
  - E. Etter (Montpellier/UP)
- Faculty of Veterinary Science (Utrecht)
  - Prof. H. Herstebeek, D. Klinkenberg
- University of Pretoria (Dept Production Animal Studies)
  - Prof. Peter Thompson
- University of Zimbabwe (Faculty of Veterinary Science)
  - Prof. D. Phukenyi
  - Dr. K. Nyathi, MSc Student
- Instituto de Investigação Agrária de Moçambique (IIAM)
  - Dra Rosa Costa
  - Dr. Zacarias Massicame

## Participants CORUS FMD Project Network



- Texas A&M University
- Onderstepoort Veterinary Institute
- Botswana Veterinary Institute
- Directorate Animal Health, Limpopo & Mpumalanga
- SanParks
- FIRM
- SADC FMD
- FAO Regional Office
- Lelystad Biological Products
- Australian Institute of Animal Health

## Development of epidemiological tools: QRA model

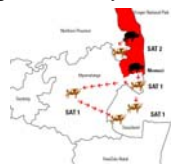


- Objectives
  - to understand and quantify the pathways leading to FMDV transmission between wildlife and cattle
  - to quantify those pathways and parameters having a major contribution to the risk of transmission
  - to give an estimate of the risk of transmission between cattle and wildlife in the interface of KNP.
  - to identify where are the most important information gaps

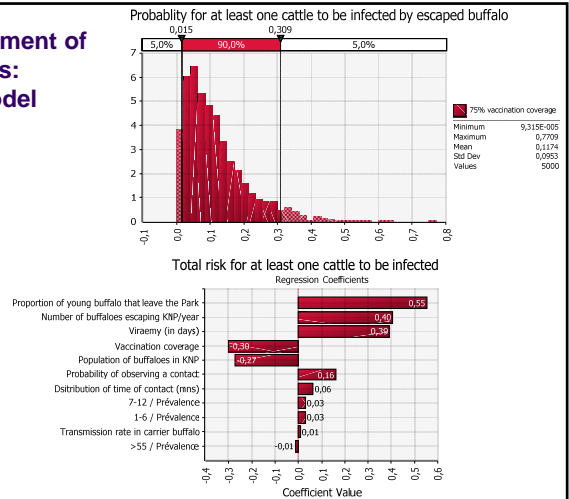
## Applications of the QRA model



- Give a quantitative estimate of the probability of cattle in the buffer zone with vaccination (BZV) being infected by wildlife in the interface.
- Quantify and compare different scenarios:
  - Risk due to escaped buffalo
  - Risk due to escaped buffalo if vaccination system collapses
  - Risk due to cattle entering KNP and contacting wildlife

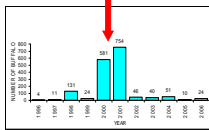


## Development of epi tools: QRA model

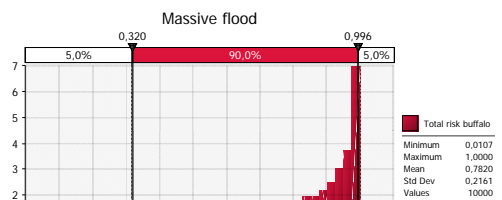


## Risk of massive escape of buffaloes

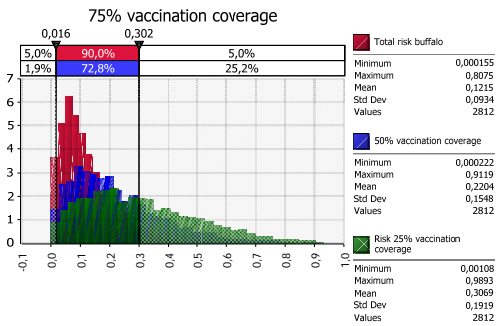
Bad years (2000-2001): 2,61-3%



## Risk of massive escape of buffaloes



## Risk of different vaccination coverages



## Conclusions on the QRA model

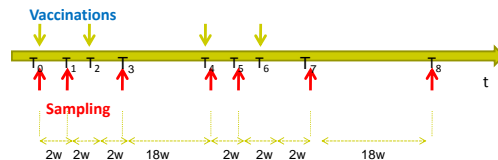
- Good prototype
- Allows to understand the different processes taking place in the transmission of FMD at the interface.
- Responds well to variations of the main control strategies (escapes of infected buffalo, vaccination coverage in cattle)
- Performance can still improve
- Allows to understand the influence of different factors playing a role in FMD transmission.
- Could be used to compare specific risk areas in KNP or GLTFCA.

## Capacity building in the region

- 2 MSc students
  - Zacarias Massicame, Moçambique
  - Khumbulani Taba Nyathi, Zimbabwe
- Registration and training at UP
- Identification of research topics
- Conception of research protocols in GNP and LNP interfaces

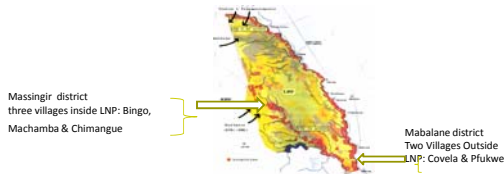
## Main research topic

- Lack of assessment of vaccination programs in the SADC region.
- **Evaluation of vaccination efficiency in protecting cattle from wildlife strains at 2 different GLTFCA interfaces**
- Longitudinal monitoring of vaccinated and control herds of cattle in high and low interface areas in GNP and LNP



## Expected results

- To determine the efficacy of the currently applied FMD vaccine (bivalent in Zimbabwe, trivalent in Mozambique)
- To characterize the FMD virus strains in circulation
- To determine whether the close proximity of wildlife has any effect on FMD antibody levels on cattle populations.



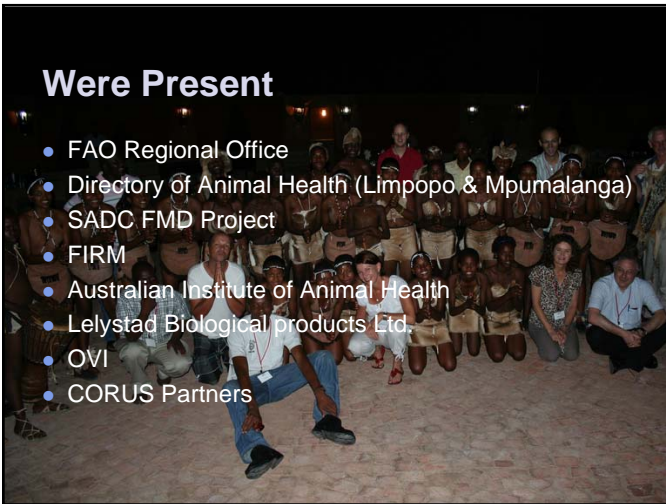
## Networking: 2009 Annual Meeting

- To present project activities
- To discuss about first line FMD control strategies in the GLTFCA:
  - Separation of cattle and wildlife (fence permeability and mitigation strategies)
  - Vaccination efficiency
- To create a synergy between the different project/role-players on FMD control at regional level.



## Were Present

- FAO Regional Office
- Directory of Animal Health (Limpopo & Mpumalanga)
- SADC FMD Project
- FIRM
- Australian Institute of Animal Health
- Lelystad Biological products Ltd.
- OVI
- CORUS Partners



## Balance of the meeting

- Discussion of research protocols presented:
  - QRA model
  - MSc protocols on vaccination efficiency
- New applications of epi tools
  - R0 to study vaccination efficiency (U. Utrecht)
- Strengthening contacts with regional role players on FMD research (FIRM, FAO, SADC, EU, Vet labs)

$$R_0 = \frac{ma \cdot a \cdot p^u}{-\ln p} \cdot b \cdot \frac{1}{r}$$

## Conclusions

- Start providing useful information for FMD in the region.
- Tangible epidemiological tool that can be tested and refined
- Research targeting key issues on FMD control
  - Permeability and contacts
  - Vaccination efficiency
- Network starts consolidating and producing interesting synergies

