ILRI activities, projects & tools and expected outcome/impact

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International Livestock Research Institute, Nairobi

Round table on OH surveillance and control of VBDs in North Africa, 23-24 April 2026

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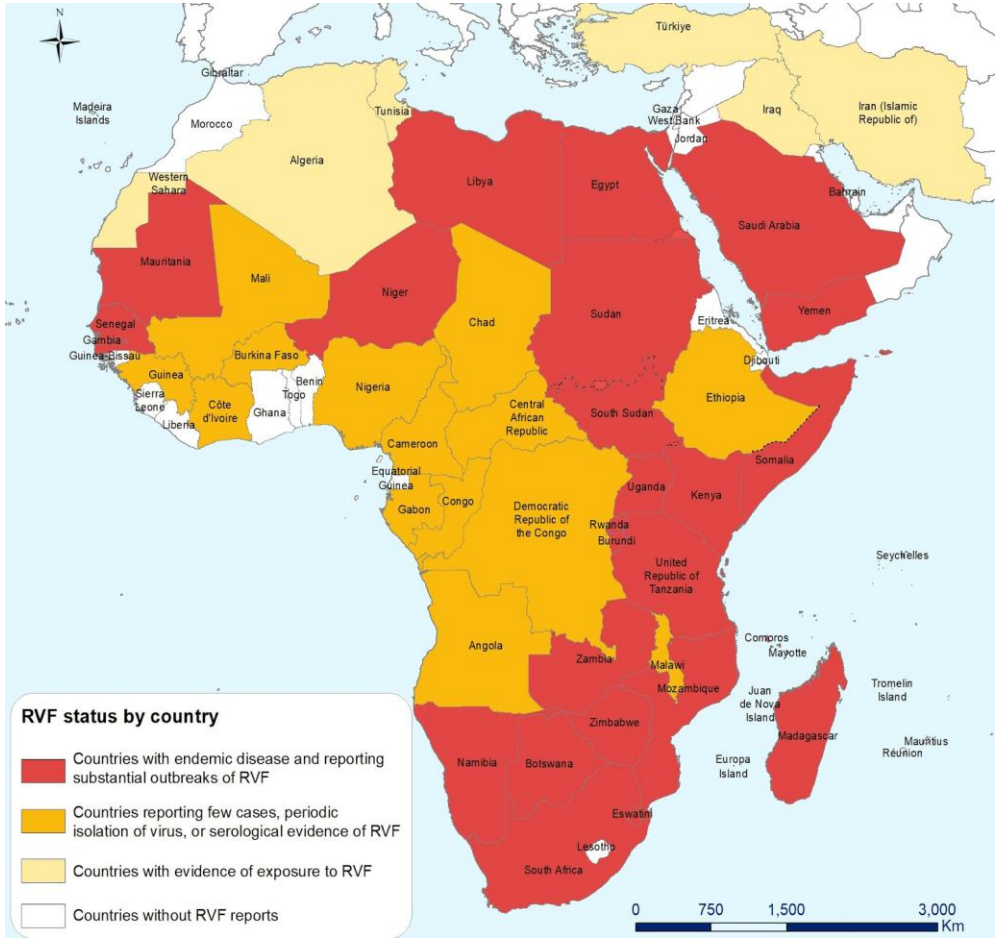
Approach

- Applied research to inform RVF:
  - Surveillance
  - Control
  - Policy interventions

Founded on One Health principles

Introduction

- RVF epidemiology -- spectrum of RVFV dynamics (Rostal et al., 2025)
  - Endemic state – RVFV can persist without the need for re-introduction
  - Hyperendemic state – the virus circulates in ruminants without outbreaks, with high seroprevalence
  - Epidemic state – periodic widespread outbreaks
- Key questions:
  - What factors support each epidemiological state (spectrum)?
  - How can we use this knowledge to improve RVF surveillance and control?



RVF status by country (FAO)

Support outbreak investigations

Outbreak investigation missions aim to:

- Boost capacity for field and laboratory detection
  - participatory epidemiology during the Senegal outbreak identified knowledge gaps
  - laboratory support for Burundi
- Generate new knowledge on drivers of RVF outbreaks

PE exercise in Senegal (Michel/ILRI)

DVS lab Bujumbura (Canesius, Bujumbura)

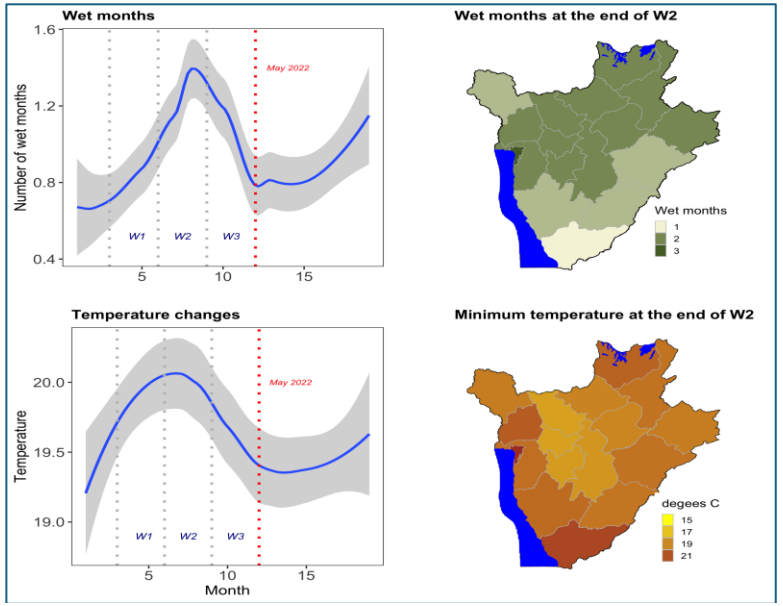
› PLoS Negl Trop Dis. 2026 Apr 10;20(4):e0014155. doi: 10.1371/journal.pntd.0014155. eCollection 2026 Apr.

Epidemiological and molecular characterization of Rift Valley fever outbreak in livestock in Burundi, May - November 2022

Canésius Nkundwanayo [1 2], Pascal Niyokwizera [1], Melance Ntunzwenimana [2], Jean Bosco Ntirandekura [2], Neilla Ntawuyankira [3], Annelise Tran [4 5], Catherine Cêtre-Sossah [5], Lionel Nyabongo [1 6], John Juma [6], Max Korir [6], Reuben Mwangi [6], Bernard Bett [6]

Affiliations + expand

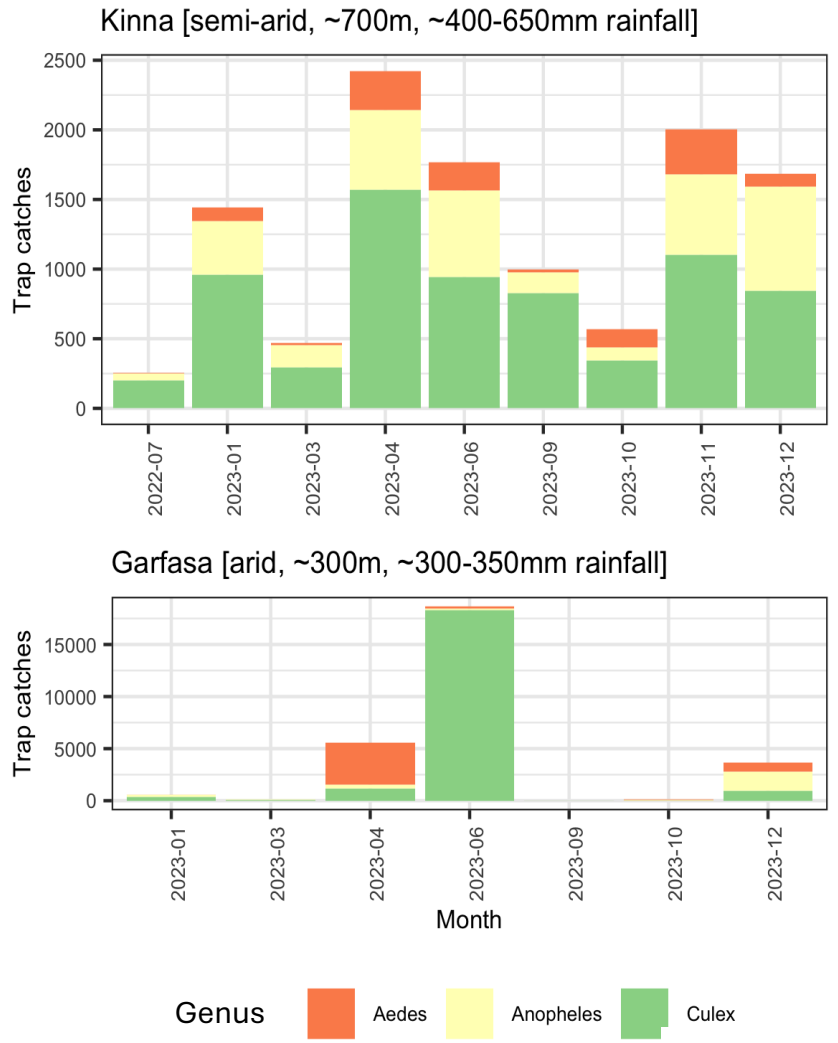
PMID: 41961907 PMCID: PMC13068329 DOI: 10.1371/journal.pntd.0014155



Risk factors for RVF outbreak in Burundi

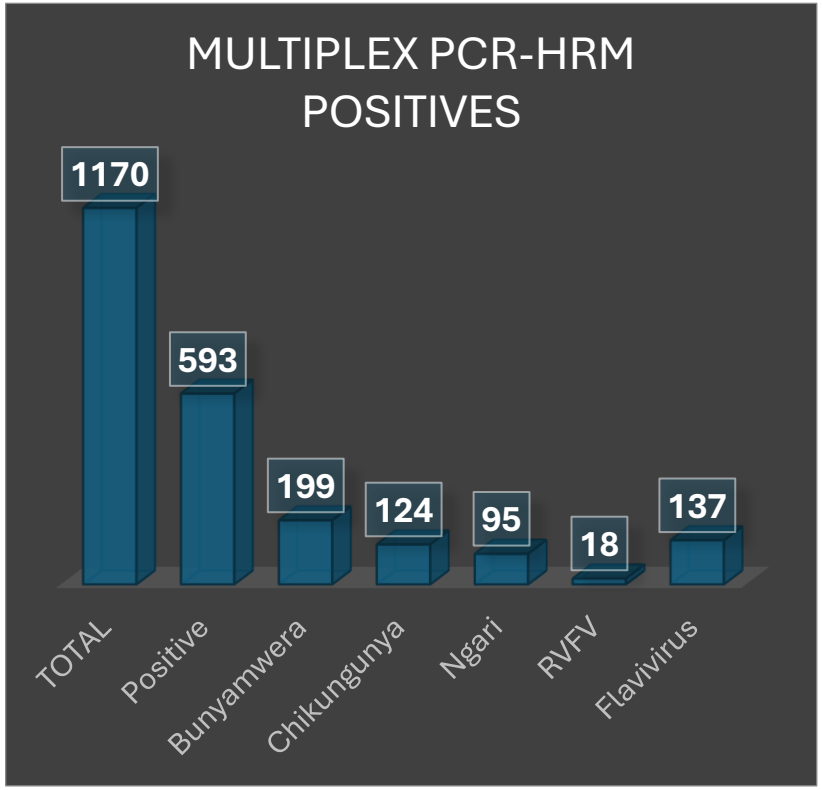
Longitudinal studies to quantify endemic transmission

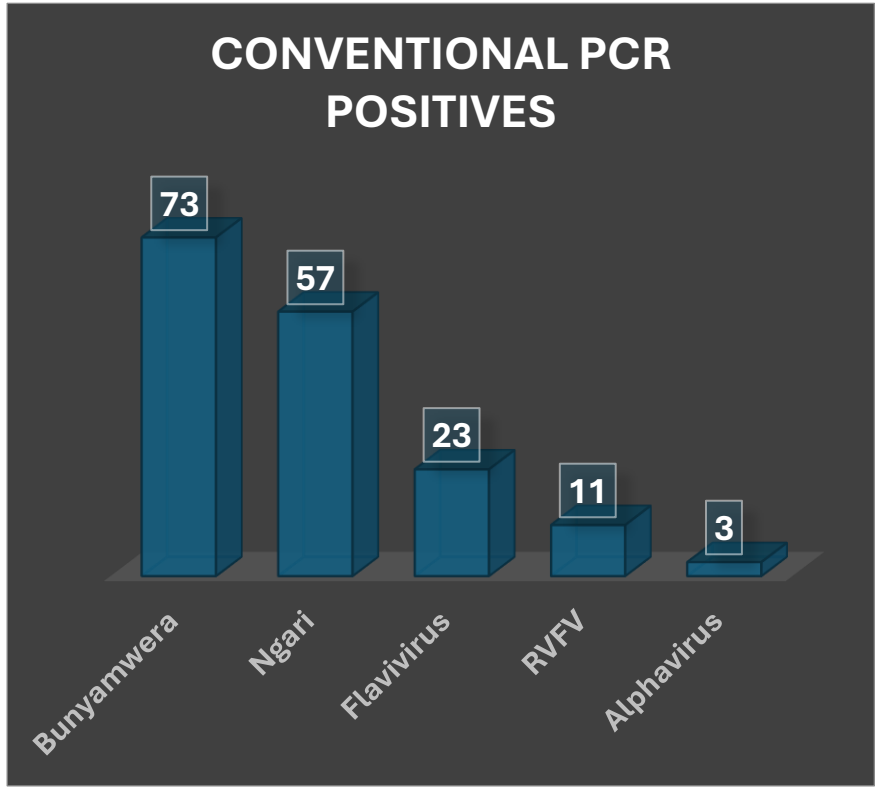
- Understanding RVFV maintenance at the ecological level – *growing evidence on horizontal transmission between livestock, humans and mosquitoes*
- An incidence study on RVFV exposure in Kenya (Muturi et al., 2025)
  i. 0.14/animal year (CI: 0.12 – 0.17)
  ii. 24 per 1000 person-years (95% CI: 13-39)
- More studies planned for East, West and South Africa (Wellcome Trust)



Vector populations in 2 ecological zones in Kenya

Detection of RVF and other arboviruses in mosquitoes in endemic sites





Virus	Sequenced	Confirmed
Ngari	30	19
Bunyamwera	30	22
Flavivirus	23	**West Nile-** 6 **Usutu virus-** 1 **ISF**- 15
Alphavirus	3	**Sindbis**- 2 **CHIKV**-1
RVFV	11	11

Indication of year-round RVFV transmission

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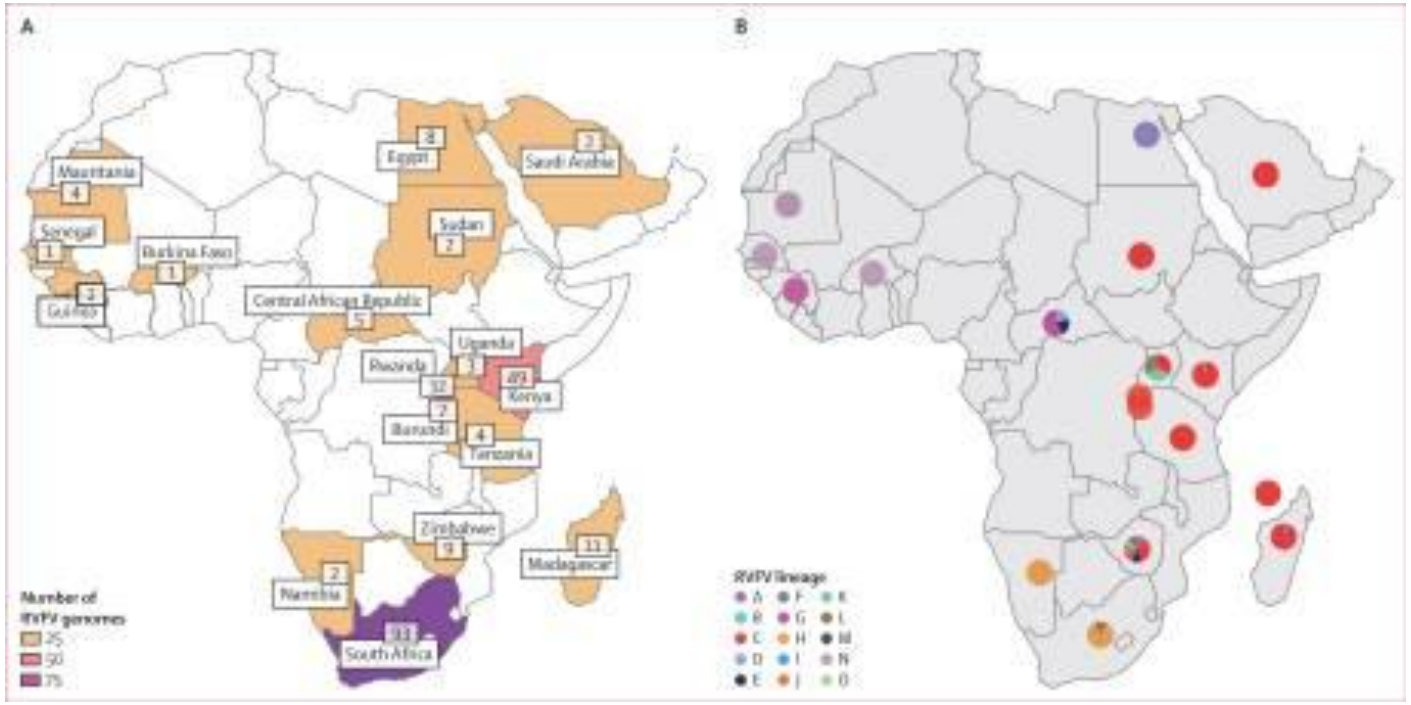
Genomic studies

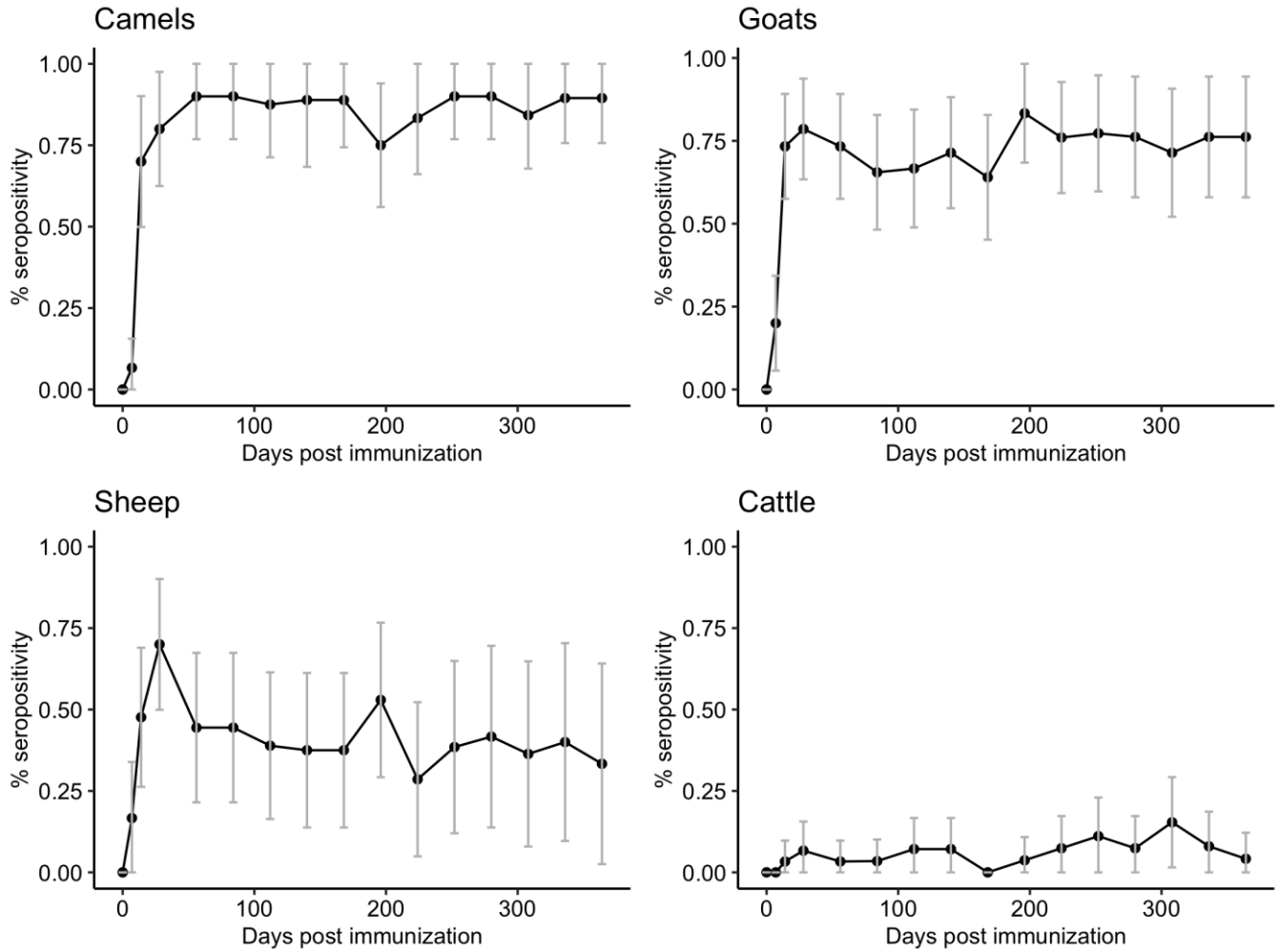
- Genomic characterization of RVFV classifies the pathogen into lineages (Juma et al., 2026)
- Next step: How can we use this knowledge for disease surveillance and control?



Number of RVFV genomes (A) and lineages by country
https://pmc.ncbi.nlm.nih.gov/articles/PMC12979000/

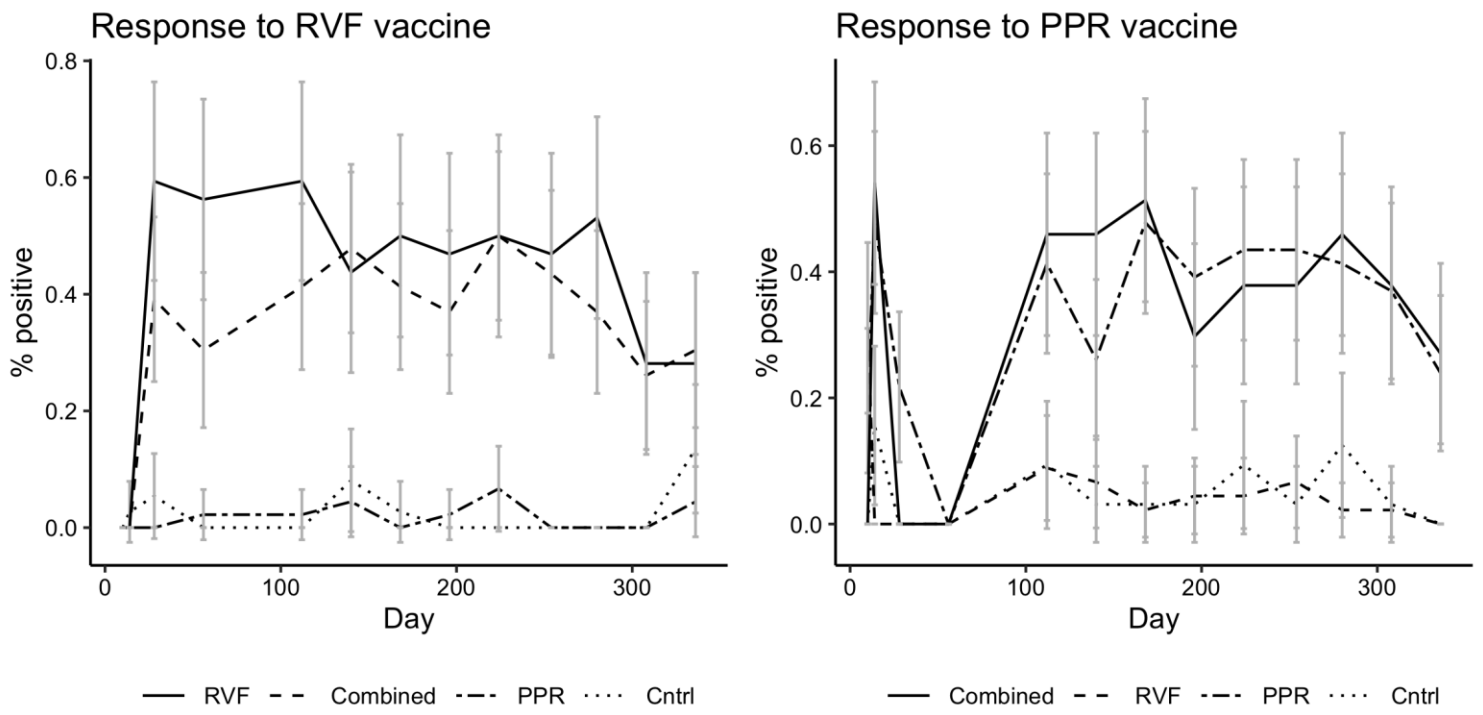
Immunogenicity studies with RVFV Smithburn live attenuated vaccine

- Camels, followed by goats and sheep in that order mount good responses
- Cattle show poor response
- Similar observations made on Clone 13 vaccine (Njenga et al 2015)
- Studies needed to assess the implication of this observation on the effectiveness of vaccination campaigns



Vaccination strategies – simultaneous application of RVFV Smithburn and PPR 75/1 strain live attenuated vaccine

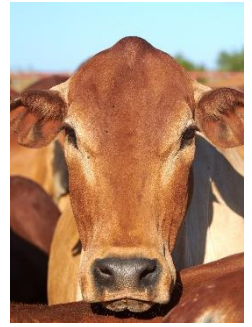
- Joint vaccination in scenarios with limited combo vaccines
- Joint application of vaccines can:
  - Improve uptake
  - Lower labor and operational costs
- Findings show potential for joint administration of PPR and RVF live attenuated vaccines in small ruminants



ILRI's CRF involvement in RVF vaccine studies

- Established RVF challenge model in sheep, goats and cattle with RVFV 56/74IN or Smithburn strain

- Capacity and capability to conducts efficacy, immunogenicity, non-inferiority and non- interference studies under laboratory and field conditions in sheep, goats, cattle and camel (eg in collaboration with Oxford, Jenner, KEMRI Wellcome Trust, Pirbright, BioVacc to test a novel replication-deficient RVF vaccine (ChAdOx1 RVF) for dossier development)



- ILRI is part of CEPI's Preclinical Modeling Network (PMN) to test novel candidate vaccines and vaccine constructs for RVF (and others) in mice models

Gendered barriers -> RVF vaccine campaign modifications

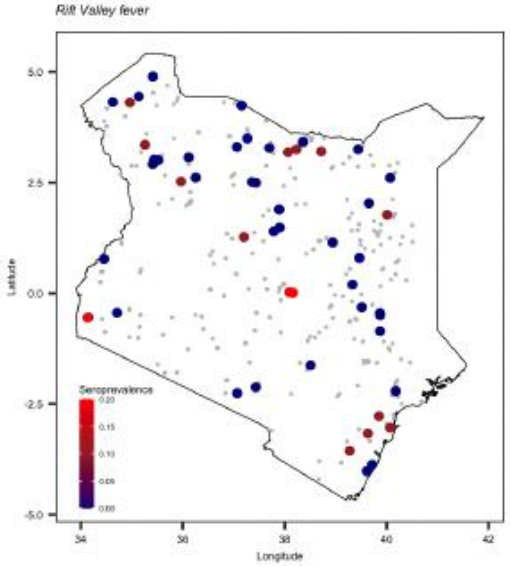
Not receiving information on time -> Engaging Community Disease Reporters, local leaders, and women's champions to share with a quota of women including women heads of household one week before vaccination

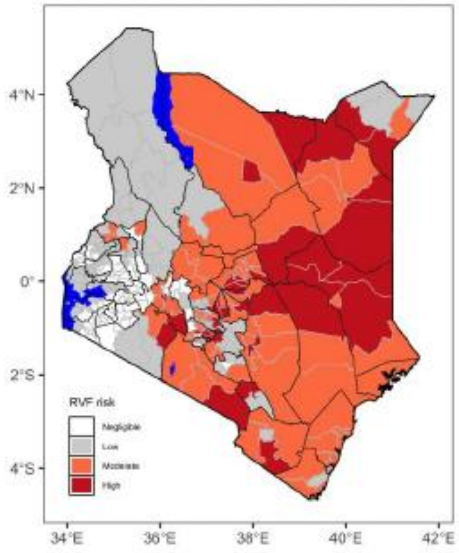
Women intimidated in the queue-> Enforcing "first come first serve" and increased staffing for orderly vaccination

Conflict with household tasks -> Early communication for better planning, service bundling with private partners to justify effort attending, community messaging supporting women's role caring for livestock, 3-day campaign

Policy interventions

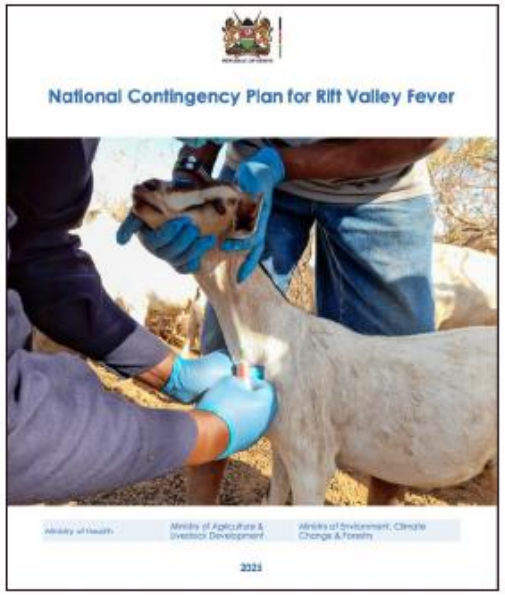
National serosurvey → Spatial analyses to develop new risk map → National RVF Taskforce → Policy documents





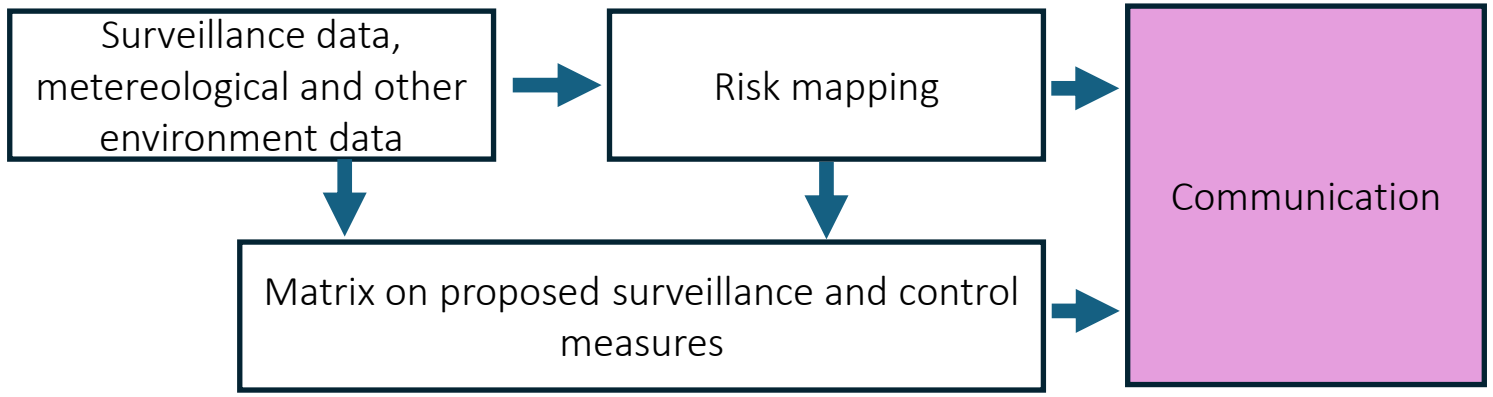
Revision to Contingency Plan:

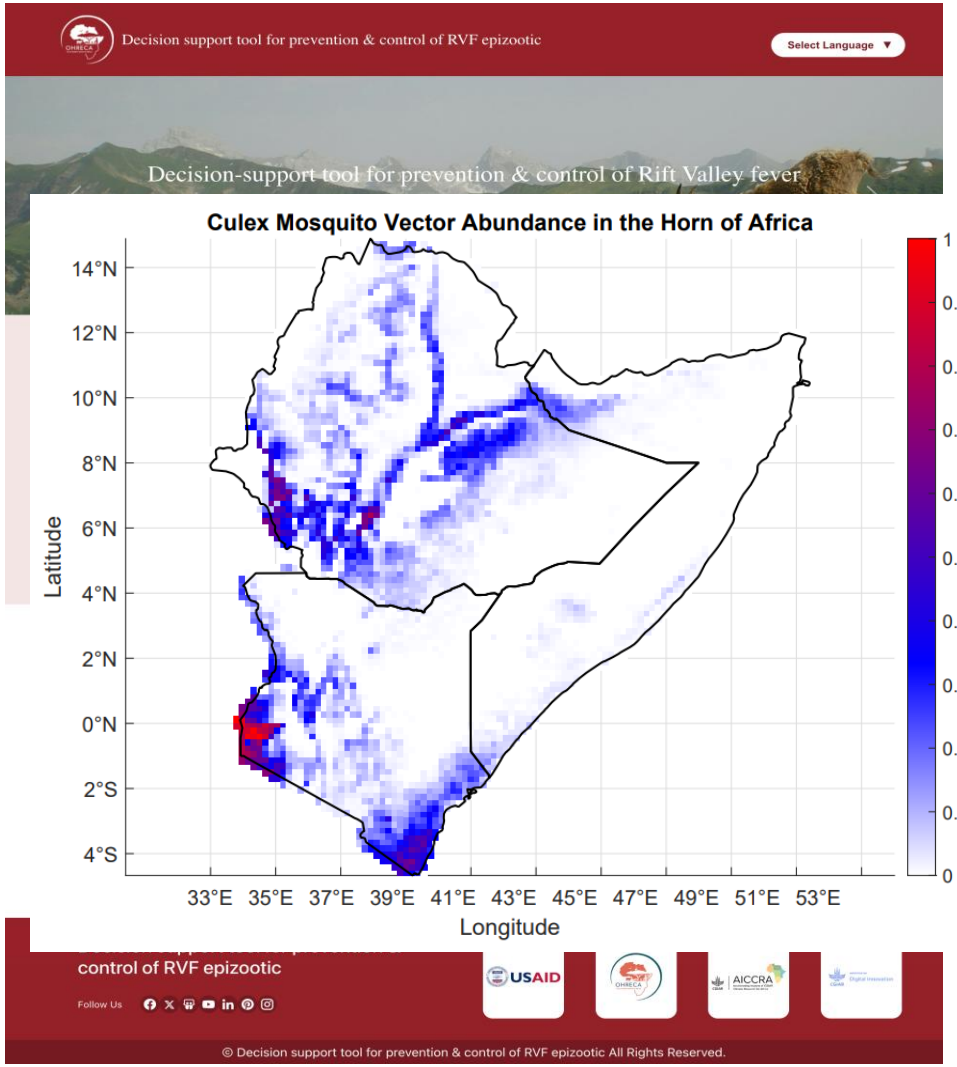
- Redefinition of an outbreak
- Revised risk map
- Risk-based approach to surveillance and response



Web-based RVF decision support tool

- System structure





- Initially based on Bayesian hierarchical model but now setting it to use ensemble modelling approach
- Mathematical model for secondary predictions (Culex map above comes from spatially explicit mathematical model)

Impact

- Capacity building – field epidemiology and laboratory screening
- New knowledge – science and product development
- Policy influence
- Reduced health and economic impact of RVF

THANK YOU

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Photo credit: ILRI/Elphas Ngugi