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Inter-epidemic Rift Valley fever virus seropositivity in an irrigation scheme in Bura, south-east Kenya

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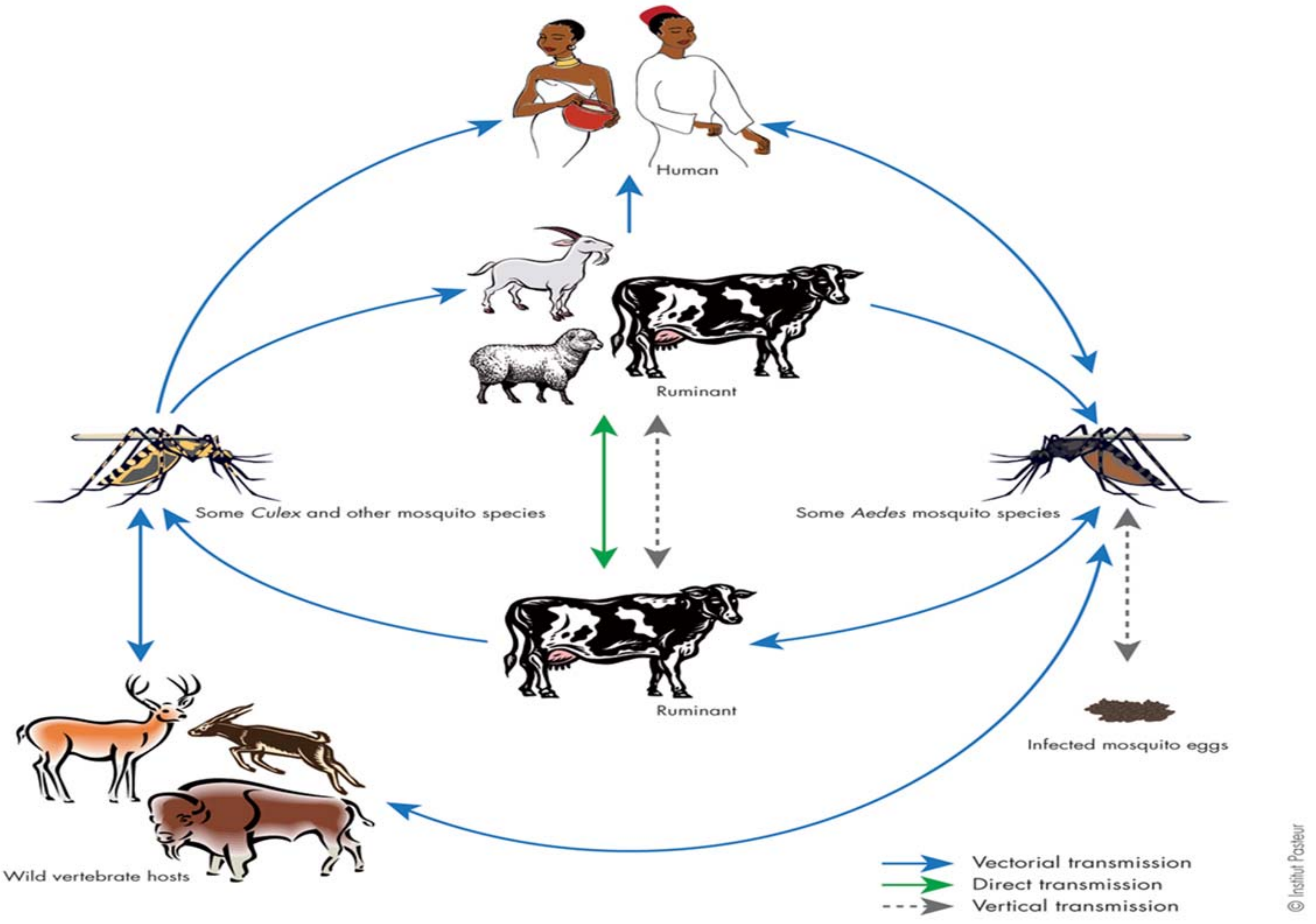
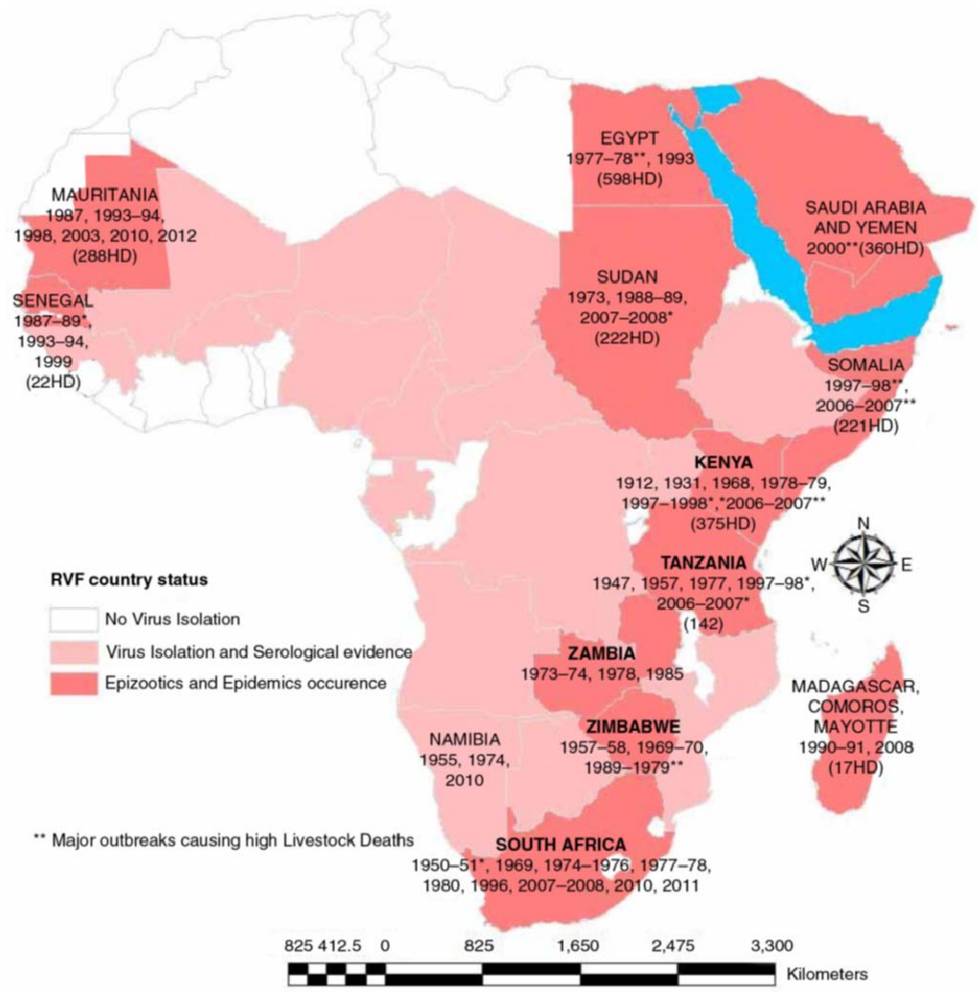
Rift Valley fever: Background



Rift Valley fever: Distribution



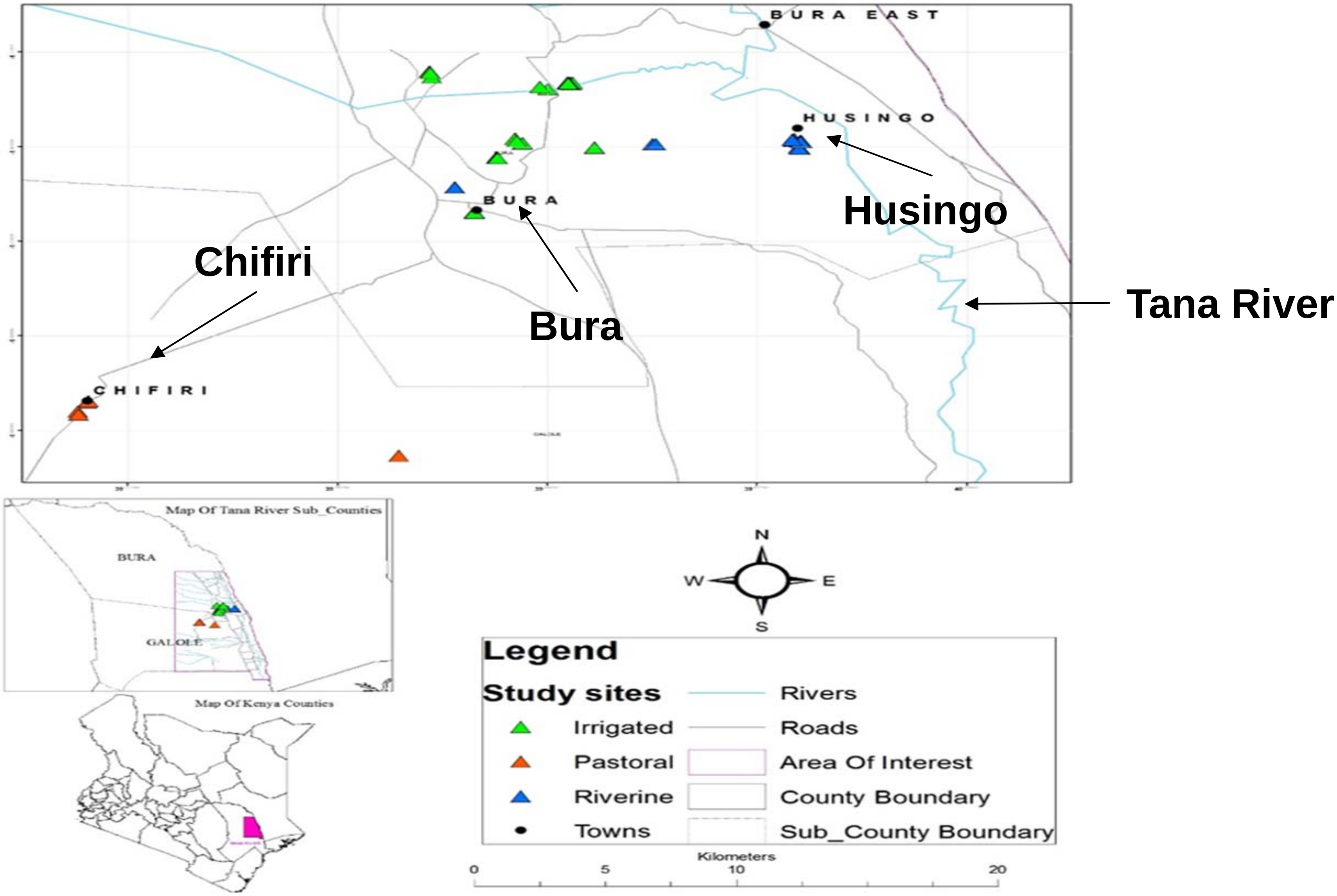
Spatial and temporal distribution of reported Rift Valley fever outbreaks in Africa and the Arabian Peninsula (1912 – 2012) Total number of human deaths (HD) is indicated for selected countries for all outbreak periods. (Nanyingi et al., 2015)

Rift Valley fever: Study aim

Investigate low-level RVFV transmission during an inter-epidemic period (IEP) in Bura irrigation scheme and evaluate the role of potential risk factors

Materials and methods: Study site

Bura irrigation scheme, Tana River County, southeast Kenya



Materials and methods: Study design

- Longitudinal study – 10 months
  - Open sentinel herd – sheep and goats
    - Screening of anti-RVFV immunoglobulin IgG antibodies directed against RVF virus nucleoprotein
    - Commercially available ELISA kits from ID Screen® from Idvet (Louis Pasteur, France)
    - Testing done using manufacture's protocol

- Bura (irrigation scheme) – 139 animals
- Husingo (riverine) – 109 animals
- Chifiri (pastoralism) – 69 animals

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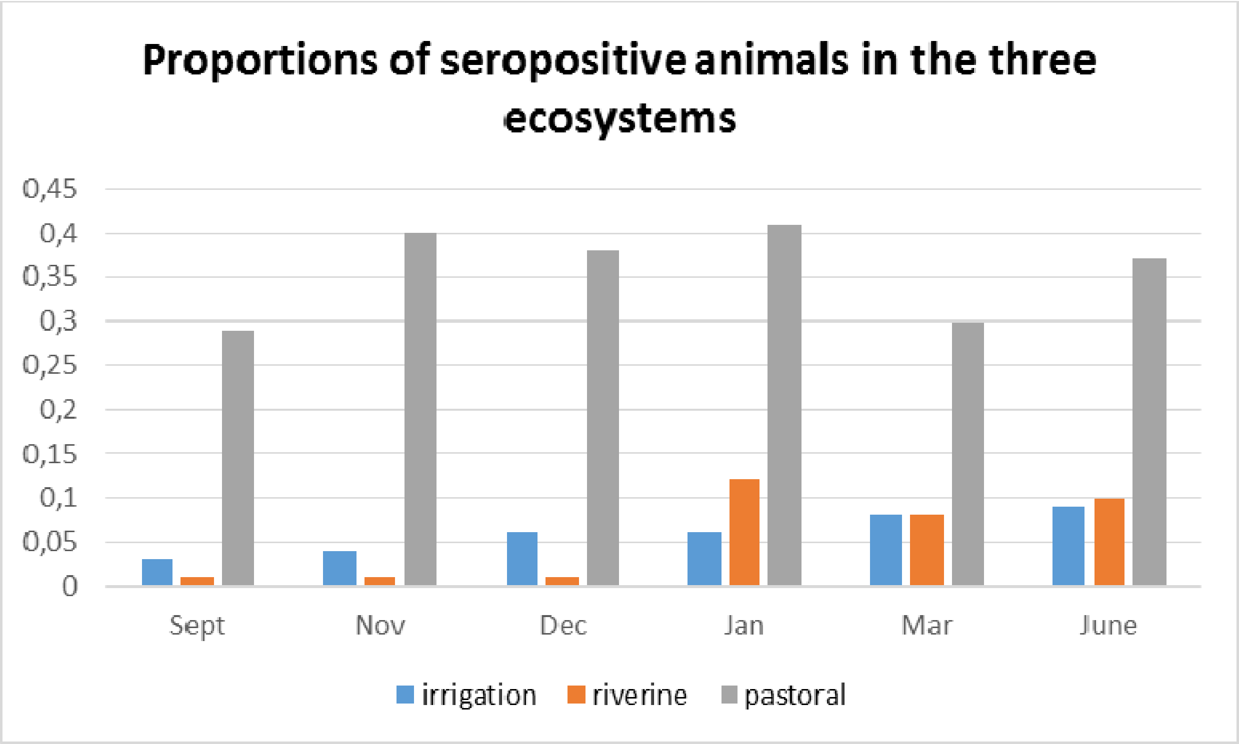
Materials and methods: Study design

- Periodic sampling done 6 times
    - 3 times during short wet season - Nov-Dec 2014, Jan 2015
    - 3 times during dry season – Sept2014, Mar & Jun 2015

- Data analysis
    - Generalized linear mixed-effects model (GLM) with binomial family structure in R 3.2.3
    - Account for sample selection method
        - Bura & Husingo – not random (from previous study)
        - Chifiri - random
    - Kaplan-Meier survival analysis
    - 2 levels of analyses (outcomes)
        - Seroprevalence
        - Seroconversion

Results: Seroprevalence

- Total 39 (12.3%) animals tested positive during study period
  - Varied across sampling sites
  - Pastoralist village - 26.1%
  - Irrigation and riverine - 8.6% and 8.3% seropositive animals respectively



Results: Seroconversion

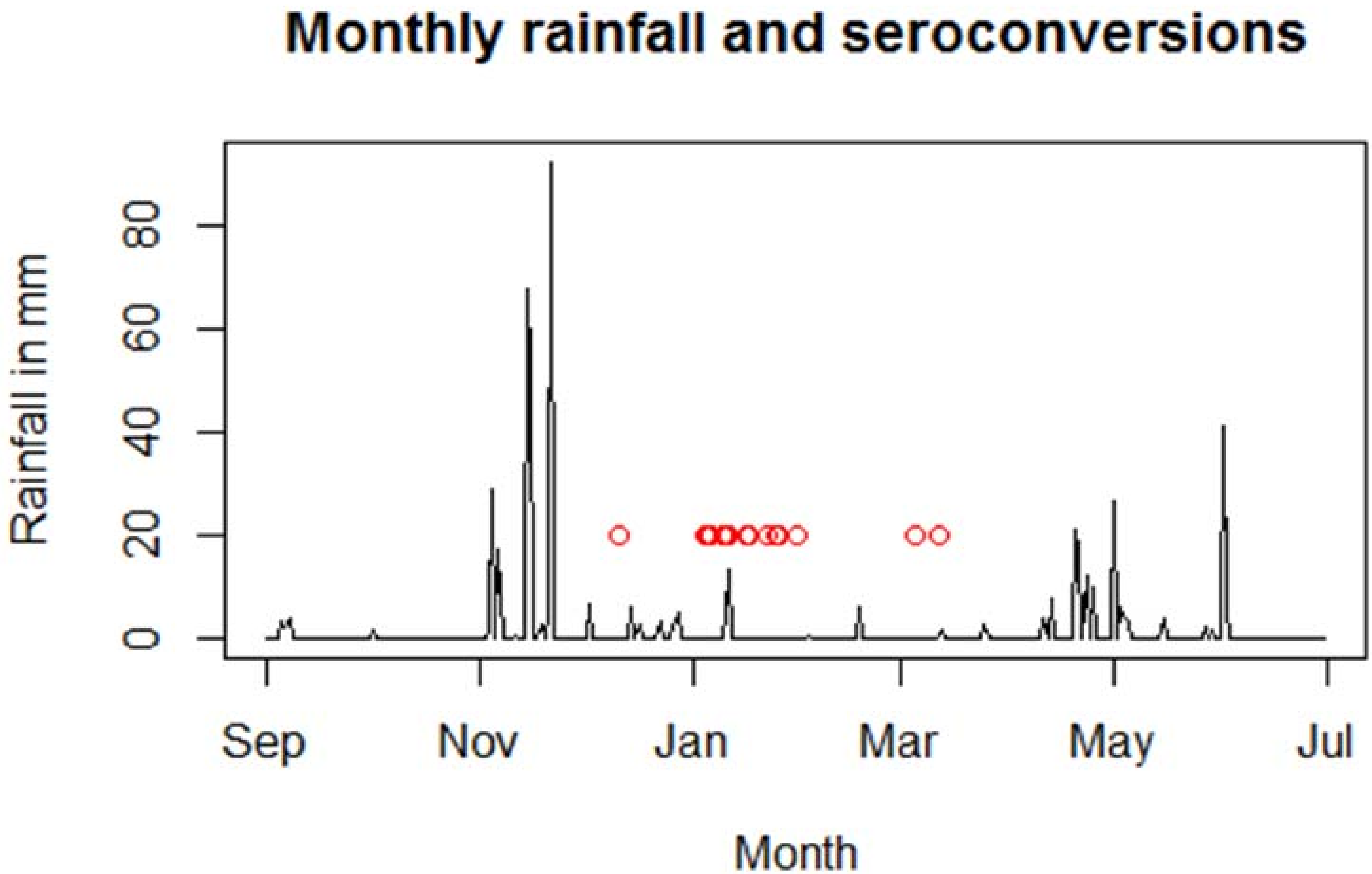
Seroconversions – 15

- Irrigation villages – 7, spread over 4 months (Dec – Mar)
- Riverine village – 8, all in Jan 2015, (wet season)
- Pastoral village – None

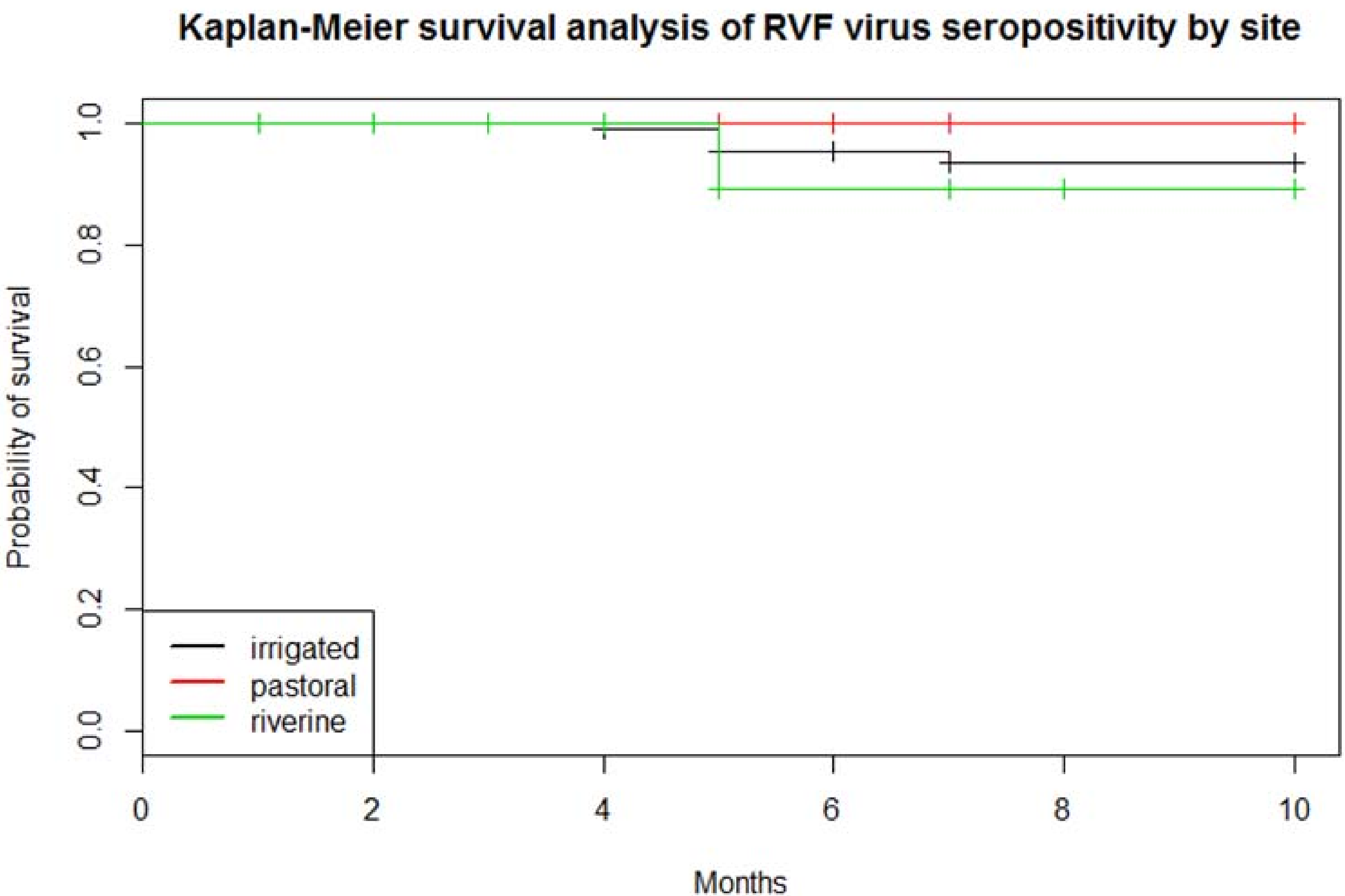
- Incidence rate (new cases per 1000 animals per month) was not significantly different ($p>0.05$) between the irrigated (7) and the riverine areas (11)

- Seroconversions significantly higher in wet season between November 2014-January 2015 than in dry season (OR=71.22, CI= 13.54- 752.15, $p=<0.001$)

Results: Seroconversion



Results: Seroconversion



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Conclusion

Creation and expansion of irrigation schemes in this region

- Establishes more habitats that appear similar to the riverine ecosystem
    - RVF incidence

- Potentially contributes in endemic transmission of vector-borne diseases that naturally occur in similar suitable ecosystems

- Increases risk of local RVFV endemicity

- Policy makers
    - Better understanding for vector and RVF prevention and control within changing environment

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- Institute for Parasitology and Tropical Veterinary Medicine

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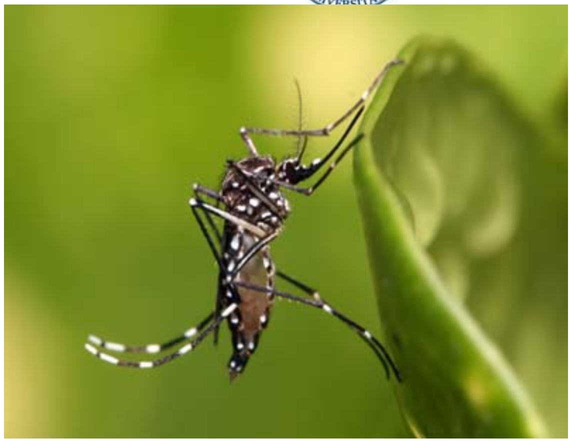
DAAD German Academic Exchange Service

ILRI INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

Thank you!

Questions?



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