Assessing risk of Rift Valley fever transmission in a pastoral ecosystem using a One Health approach

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INTRODUCTION
Rift Valley fever virus RVF (family Bunyaviridae, Genus Phlebovirus) is a mosquito-borne viral zoonosis of humans and livestock first isolated from livestock in 1930s in Kenya. It has since been associated with increasing frequency of outbreaks in domestic ruminants and humans every five to ten years with devastating impacts on public health and the fragile economy. However, the fate of the virus between epidemics has remained shrouded in mystery. We used the “one health” approach to investigate virus activity in parts of Garissa County (a major hotspot of RVF) while also determining the associated vector distribution and densities.

OBJECTIVES
- To understand the dynamics of RVFV transmission in a nomadic pastoral system during inter-epidemic period.
- To determine the distribution, diversity, and feeding preference of RVF vectors within the nomadic movement routes in north-eastern Kenya

RESULTS
Fig. 2: RVFV vector distribution
- Ae. mcintoshi is more prevalent in semi-arid north.
- Ae. ochraceous is prevalent towards the forest and the coast.
- Mosquito species diversity is highest in Boni forest

Fig. 3: RVFV IgG Prevalence in humans across settlements
- The was no significant difference in prevalence by village overall prevalence 30%

EVIDENCE OF RECENT INFECTION:
Five samples from villages in Fafi sub-county tested positive for IgM antibody.
- Arbadobolo-1,
- Bura – 1,
- Harjasbs – 2
- Degurdei – 1

MOSQUITO FEEDING PREFERENCE
- Ae. mcintoshi showed a conserved feeding pattern, feeding mainly on human, and cow.
- Aedes ochraceous fed on wider range of hosts mainly buffalo, cow, human and camel.
- Mx. africains had the highest number of fed mosquitos but was also highly conserved feeder (>90% fed on hippopotamus).

DATA COLLECTION
- The activities of this study were conducted between 2012 and 2014 in north-eastern Kenya.

CONCLUSION
- Active circulation of RVF virus persists during inter-epidemic period, spiking during rainy season and more intensely within the forested areas.
- Populations living in settlements along nomadic routes and/or adjacent to grazing areas are at risk of virus infection.
- Ae. ochraceous may have a role in virus transmission from wild ungulates to livestock and also to humans.
- Boni forest could serve as emergency zone for virus persistence and spread through animal movement.

IMPACT
- This study presents integrated data from vectors, livestock, and human studies as a means of understanding Rift Valley fever virus transmission pathways and risks in north-eastern Kenya.
- The data provides vital information that can be used to inform mitigation plans for preventing and controlling RVF outbreaks.

REFERENCES
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