



Assessment of the Impact of Anthropological and Environmental Factors on the Management of Livestock Diseases in Muchinga and Western Provinces of Zambia

JB. Muma, DC Sitali, C. Mumba, M. Munyeme
Department of Disease Control, School Of
Veterinary Medicine, The University Of Zambia

Research Interests



- 1. Epidemiology of Brucellosis, Bovine Tuberculosis, Cysticercosis In Cattle , Humans and wildlife.**
- 2. Evaluation of Social Determinants of Human Anthrax and Cysticercosis Transmission in Zambia**
- 3. Investigation of food borne pathogens and their antimicrobial resistance in animals and humans- A Pilot Project For Zambia**

Introduction



Animal diseases constrain livestock production and trade in sub-Saharan Africa (Chavwanga, 2013).

Factors associated with disease spread are linked to:

- ▶ the pathogens
- ▶ animal hosts
- ▶ the environment
- ▶ human behavior

Introduction continues



- ▶ Ecological factors affect the rate of development and survival of livestock disease pathogens.
- ▶ Human behavior, shaped by local cultures, beliefs and norms also influence community livestock keeping practices, perception and interpretation of livestock diseases and adherence to best livestock management practices.

Introduction continues



- ▶ In Zambia, a number of studies suggests possible impact of ecological and anthropogenic factors on disease occurrence and maintenance (Sitali et al., 2017, Munyeme et al., 2011, Muma et al., 2011).
- ▶ Identification of major drivers, contextualized to a given ecological setting is required to effectively design appropriate interventions (Plowright, et al., (2008).

Problem statement and justification



- ▶ High prevalence of livestock diseases that constraint livestock production and trade (Chavwanga, 2013).
- ▶ Livestock disease have detrimental consequences for public health, ecosystem health and biodiversity.

Problem statement and justification continue



- ▶ However, most current interventions demonstrate a poor understanding of ecological and anthropological drivers shaping livestock disease maintenance and persistence (Sitali et. al 2017).
- ▶ A holistic approach to disease prevention and that considers anthropological and ecological factors will enhance the effectiveness of interventions (Plowright, et al., (2008)

Study aim



To assess the impact of anthropological and ecological factors on the management of livestock diseases in Muchinga and Western provinces of Zambia

Research Questions?



What are the ecological and anthropological drivers influencing management of livestock diseases Muchinga and Western provinces of Zambia

Study area



We plan to investigate these questions within the settings of Western and Muchinga provinces using two disease models: anthrax and trypanosomosis or theileriosis.

Anthrax and trypanosomosis are endemic in both provinces, while theileriosis is majorly absent in Western province but has recently been introduced in Muchinga province.

Study techniques



We propose to use a combination of techniques that complement traditional hypothesis testing and adopt interdisciplinary approach to causal investigation (Plowright, R. K et al., 2017). Study units will be communities or ecosystems,

These techniques include:

- ▶ Epidemiologic causal criteria,
- ▶ Strong inference,
- ▶ Causal diagrams,
- ▶ Model selection,
- ▶ Triangulation,

Benefits



- ▶ Identification of anthropogenic and ecological factors of effect will help in designing holistic and more effective interventions to reduce livestock mortalities.
- ▶ This will;
 - ▶ Improve the well-being of the affected communities.
 - ▶ Increase contribution of the livestock sector to the national Gross Domestic Products;
 - ▶ Enhance the country's economic chances to access regional and international markets.

References

- ▶ Chawwanga, V (2013). the department of veterinary services and control of contagious cattle diseases in Zambia, 1907-1990: a dissertation submitted to the university of Zambia in partial fulfilment of the
- ▶ Plowright, R. K et al., (2008) Causal inference in disease ecology: investigating ecological drivers of disease emergence. *Front Ecol Environ* 2008; 6(8): 420–429, doi:10.1890/070086
- ▶ Mumba C, et al., (2017). Practices of traditional beef farmers in their production and marketing of cattle in Zambia. *Trop Anim Health Prod.* 2017 Sep 25. doi: 10.1007/s11250-017-1399-0.
- ▶ Muma, J.B et al., (2011), Brucella seroprevalence of the Kafue lechwe (*Kobus leche kafuensis*) and Black lechwe (*Kobus leche smithemani*): Exposure associated to contact with cattle. *Preventive Veterinary Medicine*, 100, 256-260. doi:10.1016/j.prevetmed.2011.03.013

Reference

- ▶ **Muma JB** et. al.,(2009). Mortality and commercial off-takes in adult traditional cattle in Zambia. *Tropical Animal Health and Production*. 41:783-789. doi: 10.1007/s11250-008-9252-0
- ▶ Munyeme, M., et al., (2011). Failure to detect tuberculosis in Black lechwe antelopes (*Kobus leche smithemani*) in Zambia, *BMC Research Notes*, 4:233 <http://www.biomedcentral.com/1756-0500/4/233>.
- ▶ Sitali DC, et al., (2017). Awareness and attitudes towards anthrax and meat consumption practices among affected communities in Zambia: A mixed methods approach. *PLoS Negl Trop Dis*. 2017 May 12;11(5):e0005580. doi: 10.1371/



▶ Thanks for Listening