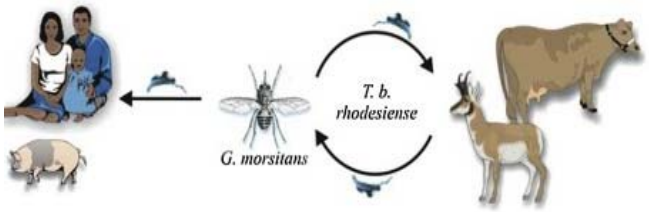
Trypanosomiasis

- A tsetse-fly borne zoonotic disease also known as **sleeping sickness** in humans and **Nagana** in animals; the tsetse fly vector can transmit disease to both animals and humans
- Over 6 million people at risk in east and southern Africa; the main parasite that causes disease in humans and animals is ***Trypanosoma brucei rhodesiense***
- In cattle, Nagana can lead to frequent cases of miscarriage, infertility, significant drops in milk production, and even death



Masocha and Kirstensson, 2019, Brain Research Bulletin.

The Challenge

- Sleeping sickness used to be highly prevalent in the Maasai steppe. Due to effective prevention strategies (insecticide impregnated targets, fly traps, insecticide-treated cattle), sleeping sickness is no longer perceived as a major public health problem among pastoralist communities
- However, the changing environment (incl. climate change and land use), threaten to trigger re-emergence of this disease
- This study thus addresses the need to increase resilience of Maasai to potential re-emergence of trypanosomiasis through a **multisectoral approach involving the health, environment and agriculture sectors**

The Project

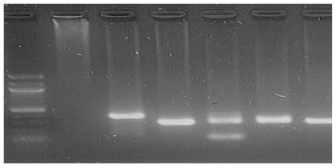
- This is one of 5 projects supported under the TDR-IDRC Research Initiative "Population Health Vulnerabilities to Vector-Borne Diseases: Increasing Resilience under Climate Change Conditions in Africa" 2013-2017
- Aim: To increase resilience of Maasai pastoralists to trypanosomiasis in the context of changing climate and land use
- This project contributes to the **Libreville Declaration on Health and Environment in Africa and the UN SDGs**

The research site - Maasai steppe

The Maasai Steppe is a semi-arid grassland that covers part of northern Tanzania, where the Maasai people, their livestock and wildlife have co-existed for over a hundred years. Currently, many disease vectors exist due to:

- Persistent droughts
- Large livestock population
- Seasonal tsetse fly density

Methodology



KEY RESEARCH FINDINGS

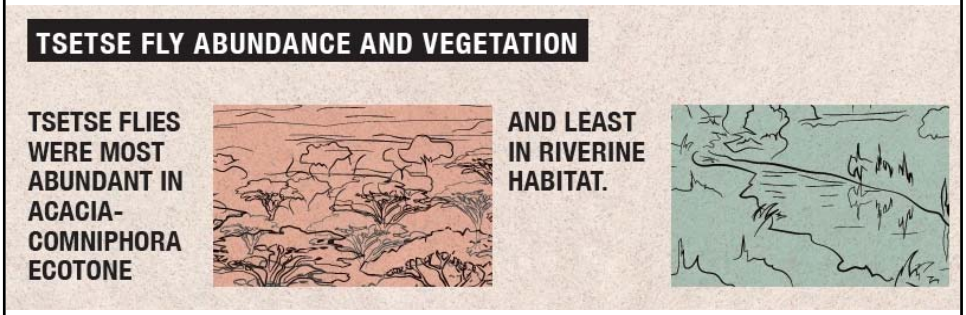
Key Finding #1

Maasai had limited awareness of trypanosomiasis

- Majority of Maasai (94.75%, n = 379) knew that the tsetse fly transmits trypanosomiasis to their cattle, but had poor knowledge that the fly also transmits the deadly sleeping sickness to humans
- Only 34% (n = 136) of Maasai were able to recognize symptoms of sleeping sickness.

Key Finding # 2

Vegetation affects tsetse fly abundance



Key Finding #3

Prevalence of trypanosome species

T. vivax was the most prevalent parasite species (95%) detected in tsetse flies that transmit Nagana to cattle.

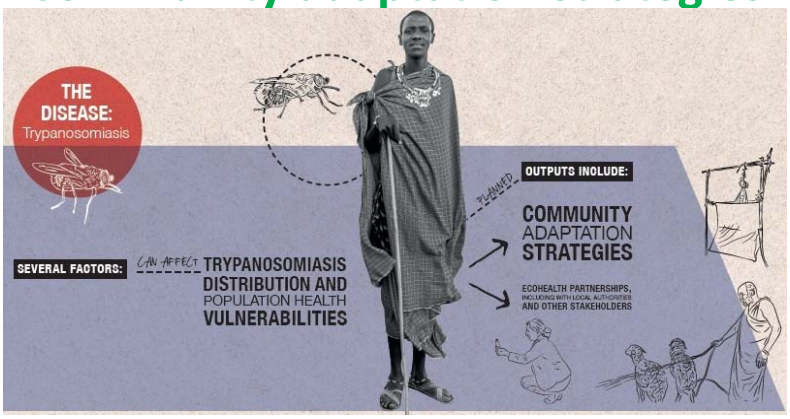
Key Finding #4

Infections are linked to climate

Parasite infections in cattle were highest from end of wet season toward dry season.

Solution #1

Community adaptation strategies



Community partnership groups, composed of Maasai, researchers, health and environment sectors and other stakeholders, were established for the development of community adaptation strategies

Solution #2

Linking environmental data with trypanosomiasis

- We linked climate and environmental data with trypanosome infection rates
- We did this by integrating data from satellite images on precipitation, temperature and water bodies with local data on tsetse fly density and trypanosome infection rates
- This linkage shows the importance of understanding the interface between trypanosomiasis with the changing environment and climate

Solution #3

Smartphone app informs Maasai about tsetse infested areas

- We developed mapping tools that may be useful for decision-making by the Maasai.
- This led to the development of a smart phone app that informs the Maasai about tsetse infested areas.
- This way, Maasai farmers can see where it is safer to take their cattle for grazing.

Research Uptake

Sharing research findings with stakeholders

Research uptake meetings with Maasai and other stakeholders were conducted as 'research action workshops' to encourage two-way dialogue

From Research to Policy

- A **policy brief** was prepared and shared not only with health ministry but also environment & agriculture ministries in Tanzania.
- **Policy dialogue** jointly organised with the Tanzania National Institute of Medical Research
- **New knowledge** from research shared with Permanent Secretary of the Ministry of Health, and stakeholders from key sectoral ministries and representatives from WHO and FAO in Tanzania
- Recently, **Tanzania's National One Health Platform** prioritized zoonotic diseases of greatest national concern, and sleeping sickness was listed among 6 top zoonoses

Partners:

- TDR
- International Development Research Centre (IDRC)
- The International Research Institute (IRI) on Climate and Society at Columbia University
- WHO Department of Public Health and Environment
- WHO Regional Office for Africa, Department of Protection of the Human Environment
- Research teams, consultants, facilitators
- Special project team
- Ministry of Health and Ministry of Environments
- Policy and decision makers
- Communities

vbd-environment.org (Knowledge-sharing platform)


Asante
(Thank you)