AHEAD-GLTFCA Seed Grant 2009/10

Pathogens, Parks and People; Assessing the Role of Disease in Trans-Frontier Conservation Area Development

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AHEAD conceptual framework

Inter-disciplinary applied research….at the interface between wild and domestic animal health, ecosystem goods and services, human livelihoods and well being.

What drives disease?

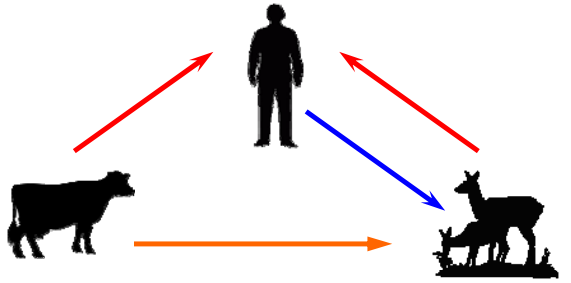
M. E. J Woolhouse et al, 2005

- Changes in landuse / agricultural practice
- Changes in human demographics / society
- Poor population health / malnutrition
- HIV / AIDS
- Pathogen evolution / drug resistance
- Failure of public health programmes
- Climate Change

Lack of integration between sciences, park management and local stakeholders

The Health Interface

75% of human illnesses are zoonotic and attributed to animals



54% of livestock pathogens can infect wildlife

44% of human pathogens can infect wildlife

If a pathogen can infect wildlife, it is twice as likely to cause an emerging human disease

Taylor *et al.* 2001

Practical Work

Theme 2: Animal Health and Disease

- basic information on incidence of spatial and temporal patterns of disease not known….wildlife, domestic animals and humans

Theme 3: Land Use. Ecosystem goods and services, and animal health

- need for ground truthing livestock numbers, conditions, disease status.

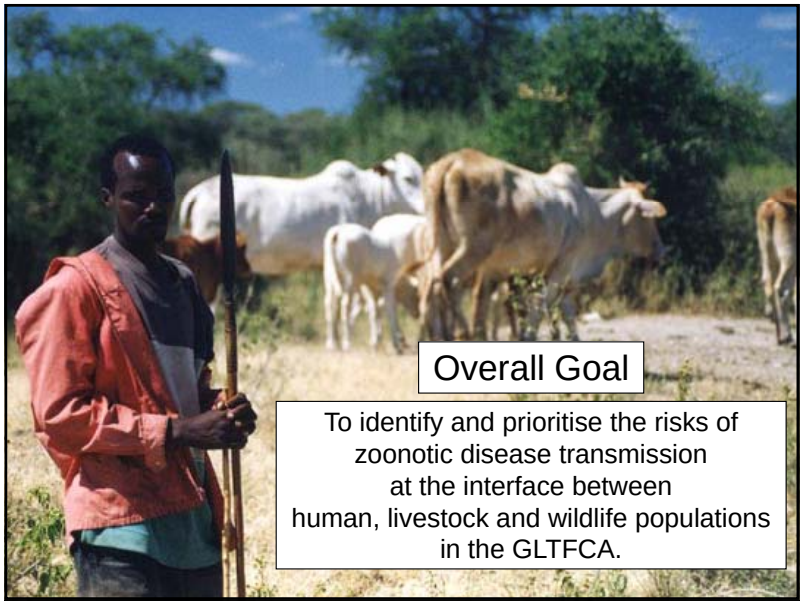
Theme 4: Human Livelihoods, animal and ecosystem health

- how plausible are alternative livelihoods, current benefits and costs compared to alternative futures

Theoretical

Theme 5: Policy support, capacity building at local, national and regional scale

Theme 6: Communication and Outreach



Overall Goal

To identify and prioritise the risks of zoonotic disease transmission at the interface between human, livestock and wildlife populations in the GLTFCA.

Specific Objectives

1. Quantify the practical risk factors for zoonotic disease transmission between wildlife, livestock and people in the GLTFCA

2. Record the current disease concerns for wildlife, livestock and people in the GLTFCA

3. Record the awareness of zoonotic disease of local people and health service providers in the GLTFCA.

4. Provide estimates of the current and potential impact of zoonotic disease on the health of communities, livestock and conservation initiatives in the GLTFCA

Inter-disciplinary team

Zimbabwe
- CIRAD
  - Research Platform – Private Community Partnership (RP-PCP)
- University of Zimbabwe
  - Centre for Applied Social Sciences (CASS)
  - Geography Department
  - Veterinary Department
  - Tropical Resource Ecology Programme, Biological Sciences
- National University of Science and Technology (NUST)

South Africa
- University of Pretoria, South Africa
  - Mammal Research Institute, Department of Zoology and Entomology,

USA
- University of California - Berkeley
  - Department of Environmental Science, Policy and Management, College of Natural Resources,

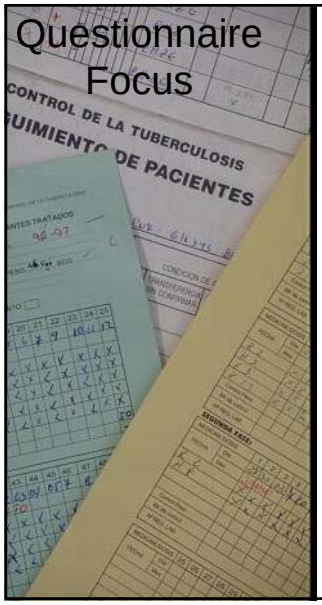
Methods

Household Questionnaires (100)

Individual Questionnaires at clinics and diptanks (100)

Community Focus Groups

All in collaboration with local organisations



Questionnaire Focus

Animal Health

Household Demographics

Household Health

Natural Resource Use (Water, food)

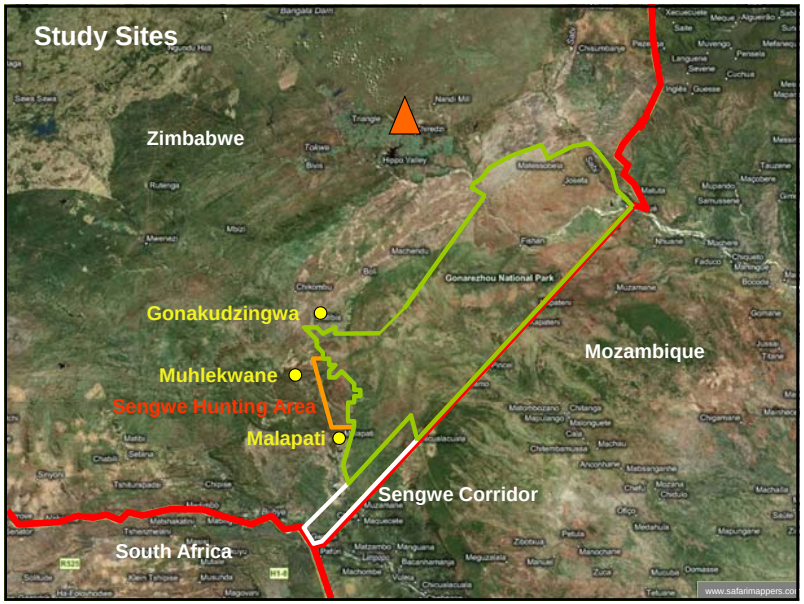
Agricultural Practices

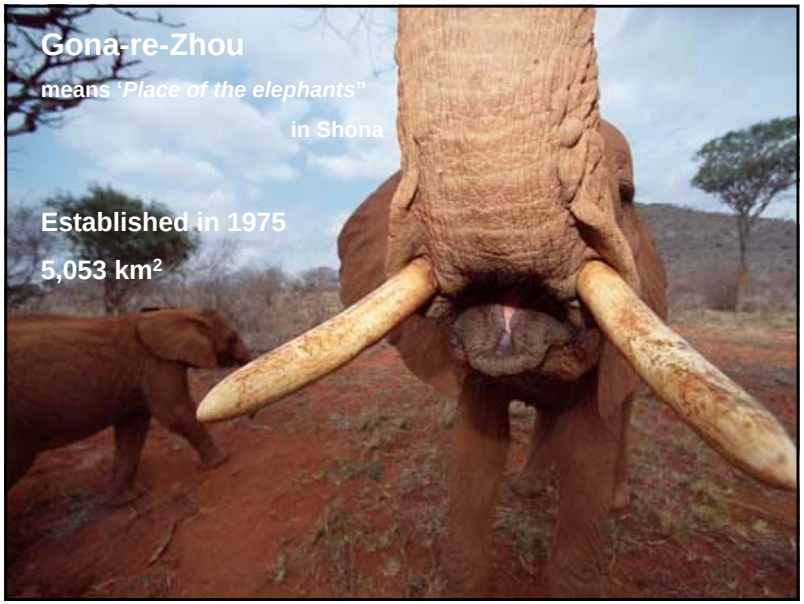
Human, Livestock and Wildlife Contact

Economic Impacts of Disease

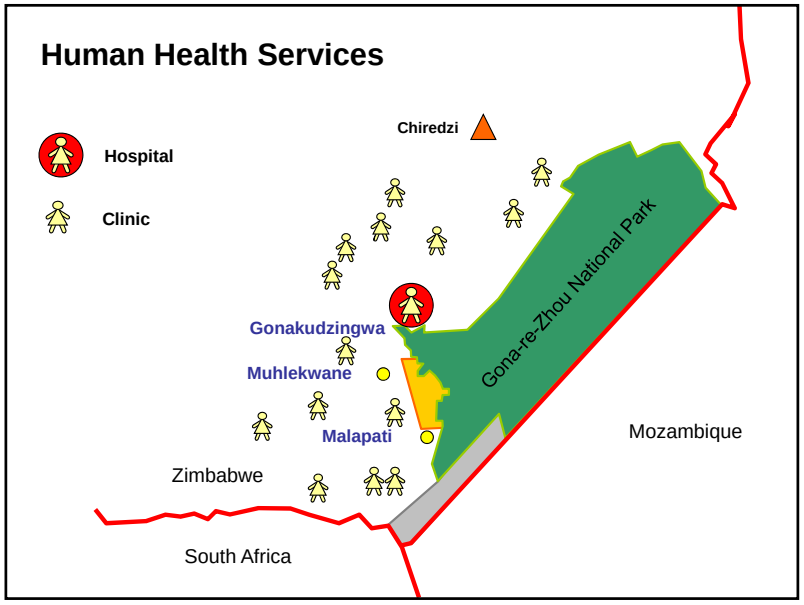
Perceptions of Disease

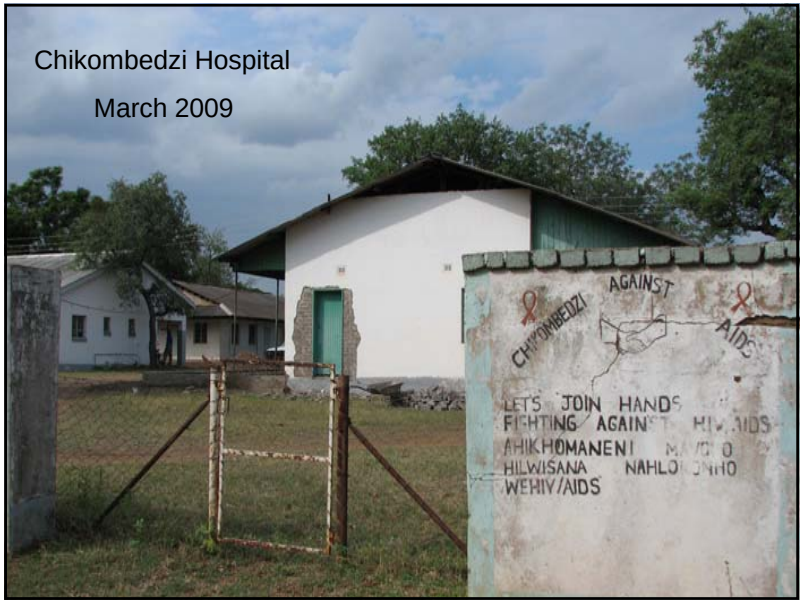
Perceptions of the GLTFCA

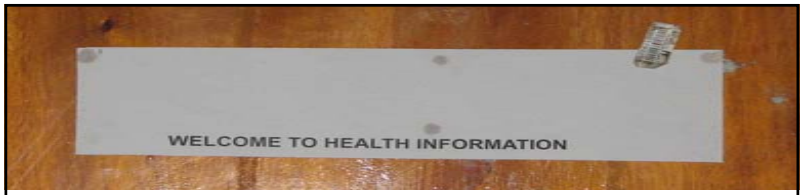





SENGWE II
HUNTING AREA
MALIPATI
AIR STRIP
T/OFF


Human Health Services
Hospital
Clinic
Chiredzi
Gonakudzingwa
Muhlekwane
Malapati
Gona-re-Zhou National Park
Mozambique
Zimbabwe
South Africa


Chikombedzi Hospital
March 2009
AGAINST
AIDS
LETS JOIN HANDS
AHIKHOMANENI
HILWISANA
WEHIV/AIDS



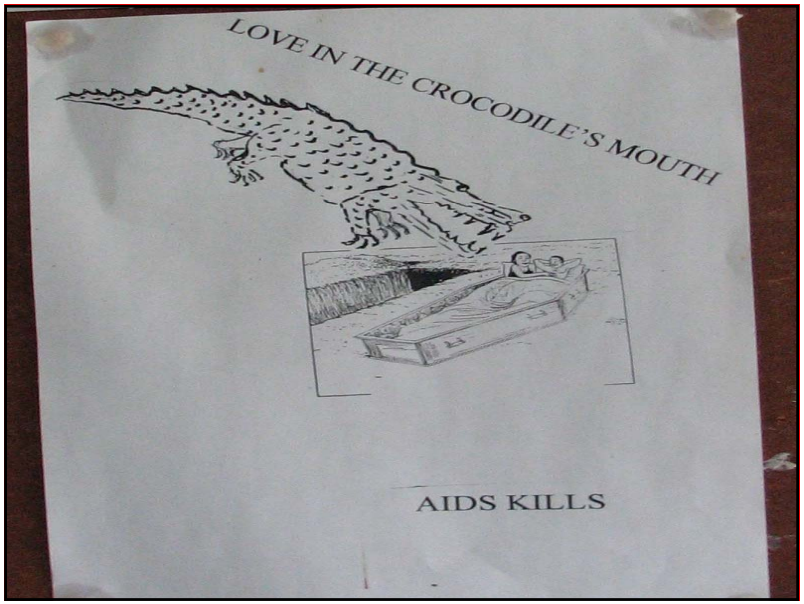
Top 5 Health Problems, 2009

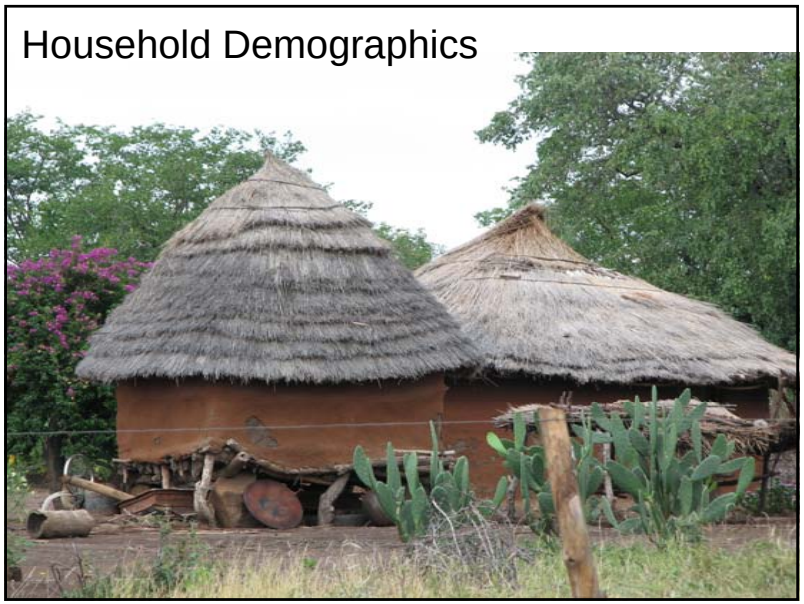
1. Malaria
2. HIV / AIDS
3. Injuries
4. Tuberculosis
5. Sexually Transmitted Diseases

HIV / AIDS testing and counseling services

TB department – contact tracing programme

Youth Centre – Sexually Transmitted Diseases





Human Demographics

Respondents Age : 15 – 81 years

Place of Birth :

- Gonakudzingwa – 20% (7 areas, maximum distance 240km)
- Muhlekwane – 18% (15 areas, maximum distance 300km)
- Malipati – 48% (**19** areas, maximum distance **410**km)

Languages: 6 local languages

Most widely understood: Shangaan (100%, 94%, 57%)

2nd: Ndebele (60%, 59%, 45%)

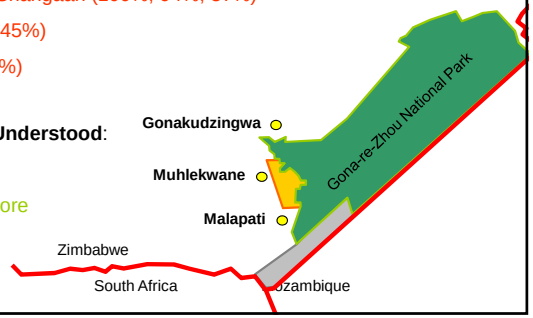
5th: English (10%, 15%, 3%)

Number of Languages Understood:

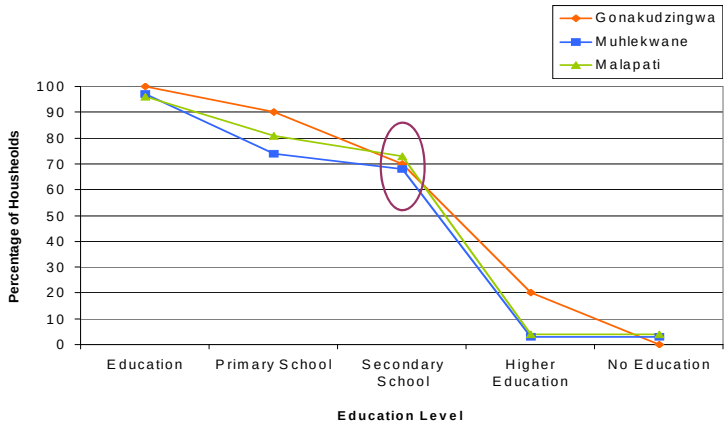
Gona: 60% 3 or more

Muhlekwane: 80% 3 or more

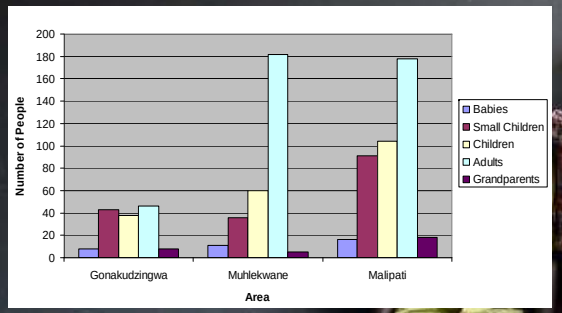
Malipati: 90% 2 or more



Education

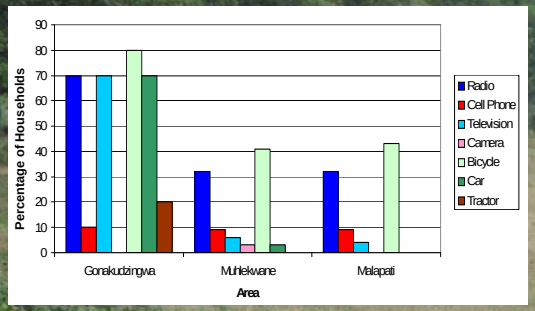


Household Composition



Average Household Size: 5 – 10

Household Possessions



Cell Phone Users also have…..

Gona – 100% radio or television

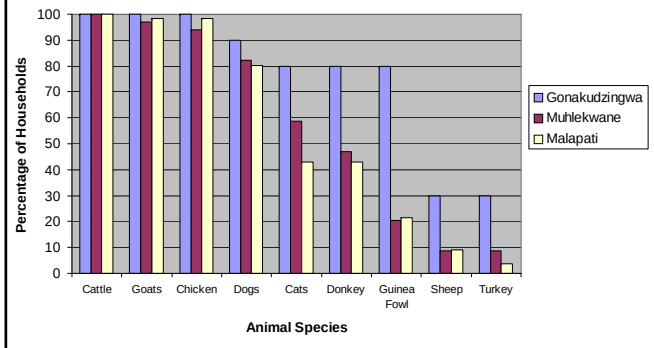
Mulekwane – 65% radio, 34% television

Malipati – 80% radio, 40% television

Electricity – Muhlekwane 6%, Malipati 2%, Gona 0%

All households use firewood for cooking

Household Animal Ownership



Species assemblage will be important for disease potentials

No correlation between household size and age composition with animal ownership, species or stock numbers

Cattle Population Dynamics

Bought: 2 – 5% households

Reasons: Increase Stock,
Traditional healing payments,
Bride Payments

Location: All local area, except Malipati, 86% >50km

Sold: 20 – 50% households

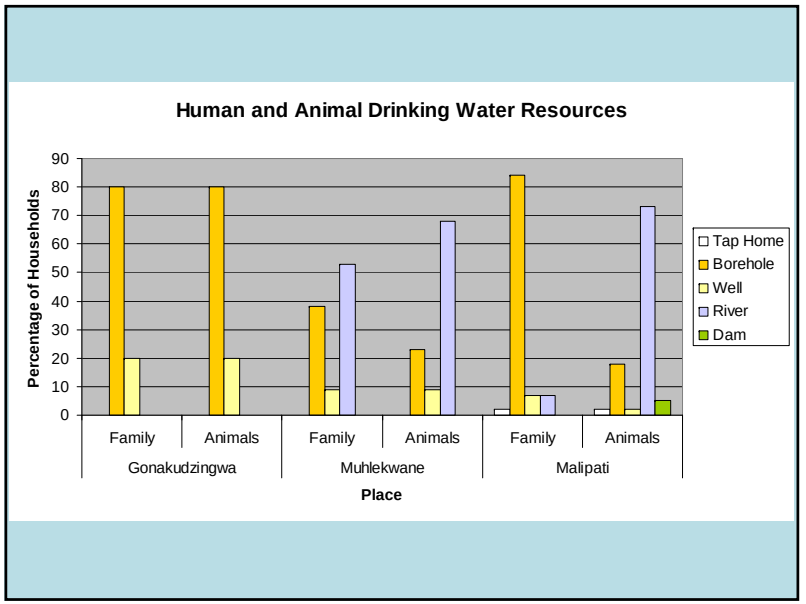
Reasons: Money for food, school fees, hospital
Bride Payments
Rituals
Delivery problems, sick, old (10%)

Location: Gona – all local,
Muhlekwane / Malipati – 14% Mozambique

Delivery problems, needed cash for hospital

Cattle Mortalities – 50% households in each area

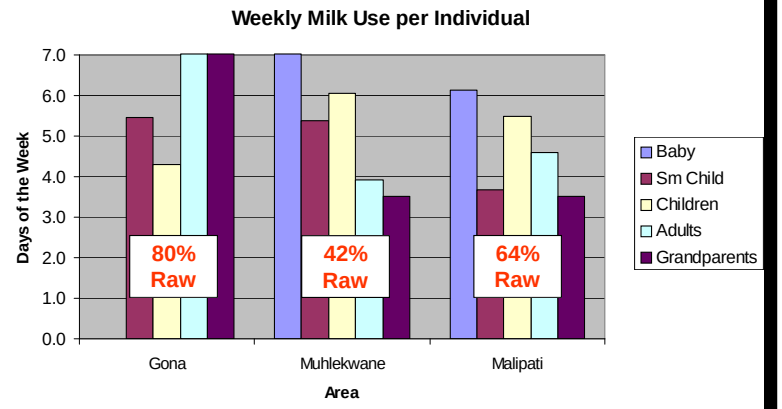
	Gona		Muhlekwane	Malipati
Heartwater	22		0	10
Foot and Mouth	22		4	1
Anthrax ★	0		4	0
January Disease	0		0	4
Lumpy Skin	11		4	0
Unknown Disease	11		46	57
Trapped in Mud	0		13	4
Trapped in Snares	0		0	9
Lack of Grazing	0		0	10
Paralysis	0		8	0
Dehorning	0		8	0
Birth Complications	0		8	1
Broken Leg	0		0	1
Predation	33	(67%)	4	0

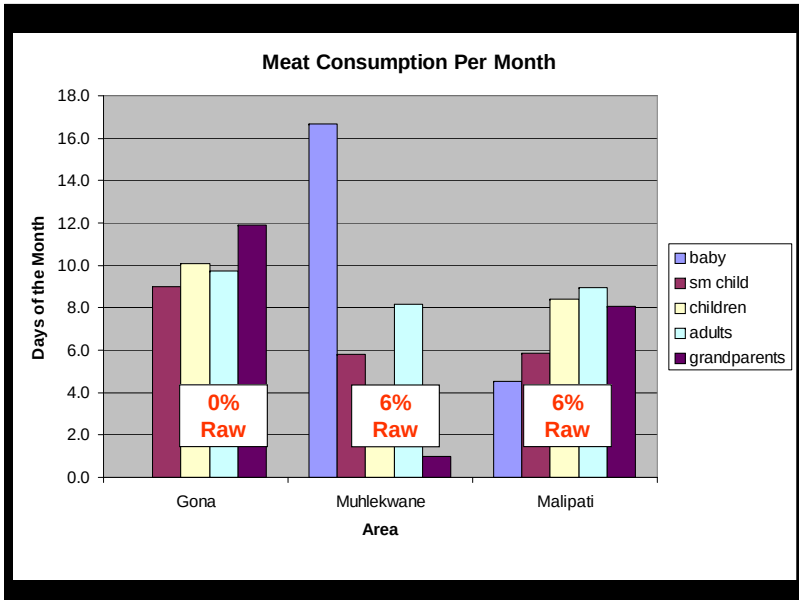


Risks through Food

Who is at risk and how regularly?

Current and potential use





Wildlife

Number of Households:

Gonakudzingwa – 100% Muhlekwane – 18% Malipati – 38%

	Gona	Muhlekwane	Malipati
Antelope	60	0	2
Buffalo	10	12	30
Bushbuck	40	3	2
Eland	0	0	4
Elephant	0	9	25
Fish	0	0	2
Guinea Fowl	10	0	0
Impala	70	9	11
Springbuck	10	3	0

Preliminary Analysis – may contribute up to 15 meat meals per month (maximum value)

Issues remain regarding uncooked meat and potential for disease transmission

Number of Households who report seeing species they consume at:

Home:	Gona – 30%,	Muhlekwane – 33%,	Malipati – 20%
Water:	Gona – 40%,	Muhlekwane – 33%,	Malipati – 25%
Pasture:	Gona – 70%,	Muhlekwane – 66%,	Malipati – 45%

Wildlife – a cause for conflict?

All areas report wild dogs are seen either at home and water sources

100% households in Gonakudzingwa report seeing lions (60% home, 30% water, 10% fields

Buffalo

Muhlekwane - 50% households see buffalo in the cattle grazing areas

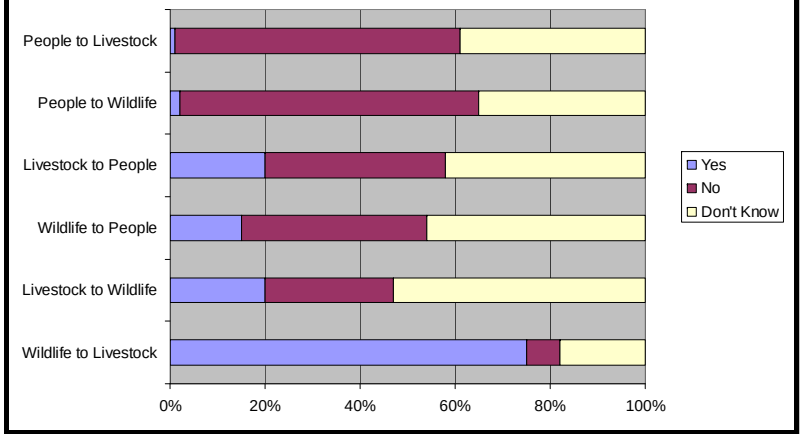
Malipati - 50% households see buffalo (4% home, 12% water, 27% grazing areas)

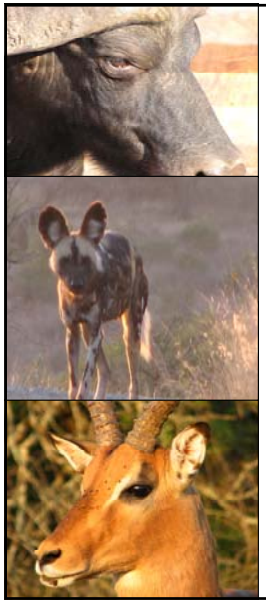
Elephants

Muhlekwane – 56% households (12% home, 3% water, 41% grazing areas)

Malipati – 45% households (11% home, 16% water, 18% grazing areas)

Perceptions of Disease Transmission





Knowledge of Disease and Perceived Risk

Buffalo - 70% of households threat to **livestock**

Reasons: FMD (81%), anthrax (8%), lumpy skin disease (5%), TB (4%)

Buffalo - 21% Malipati residents threat to **people**

Reasons: FMD (30%), TB (30%), Anthrax (20%)

Wild Dogs – 21% Gona threat to **people,** 3% Muhlekwane

Reasons: Rabies (100%)

38% households mentioned cattle or dogs can be a risk to wildlife or people.

(FMD, rabies, BTB, anthrax and lumpy skin disease)

Human Health – 3 months prior to survey

Malaria - 75% illness in children, 57% grandparents, 50% babies, 14% adults. Highest in Malipati.

Headaches - 7-25% illness, may be related to Malaria?

Tuberculosis – 5% of respondent households, up to **20% adult illness in Muhlekwane**, 7% in Malipati

Lung Problems – 9% of respondents, mostly affecting small children

Diarrhoea – 3% overall, but up to **50% illness** in small children in Malipati. Water source suggested cause?

Tuberculosis

Case Rate: 22 / 1000 people (of those who reported it to us)

Adults most affected (83% of case load):

Gona – 100% , Muhlekwane – 83%, Malipati – 91% of cases

Remaining 17% cases are in children

This equates to:

- **20% of households** being affected in Gona, and **15%** in the other areas
- Up to **50% adults** (aged over 16 years) affected in some households
- Where male and female affected, household most vulnerable to shocks
- **81% of TB affected families report other illnesses** in household members
  - increases patient load and cost for these households

What Next?

Participatory Group Analysis

Households questionnaire analysis

Link to: disease risks / potential,

economic data

drivers of human, land use and natural resource use / change

similar information collected in other parts of the GLTFCA

Thank You

Wildlife Conservation Society

South African National Parks

The Rockefeller Foundation

The John D. and Catherine T MacArther Foundation

Staff at Gona-re-Zhou National Park

Staff and students at CIRAD, Zimbabwe

The Zimbabwean Communities