Livestock, Livelihoods and Health
Analysis and engagement: the final stages of a research programme exploring zoonoses in Tanzania
livestocklivelihoodsandhealth.org

Interpreting for impact

The SEEDZ multidisciplinary team studied the changing dynamics of livestockkeeping to understand changing disease risks and local perceptions of risk. Key early results suggest:
• Pastoralists face higher disease risk than other local livestock keepers, which results in greater impacts on their livelihoods.
• Pastoralists increasingly favor sheep and goats over cattle as rainfall patterns change. This has disease and livelihood implications.

One Health partnerships are needed to understand disease fully in complex communities. Management of fever in people is challenging and improved diagnosis of zoonotic causes is needed. One Health interventions (targeting animal sources of infections) can also make an important contribution to reducing human disease risk with the potential for providing more equitable and widespread benefits to vulnerable populations than relying only on treatment of human cases.

The Brucella team sought to detect and type Brucella species in cows, goats and sheep, and determine which species are responsible for illness in people - and at what levels. The findings so far include:
• Between 3% and 4% of patients admitted to hospital for fever in the study area had brucellosis, with 75% of these being young males (aged 7-18).
• Sheep and goats are the most likely source of human Brucella exposure in the area studied.

Control programmes can now be developed that target the source and transmission pathways of infection, improving the lives of livestock keepers.

HAZEL researchers studied the transmission of Salmonella and Campylobacter through the red meat and poultry chains, integrating social and natural science. Early findings are that:
• Salmonella in the retail meat of cattle, sheep and goats is more common than in their faeces at slaughter (22% vs. 5%), suggesting contamination during processing.
• Salmonella can be found in butchers’ shops, e.g. on knives, which may contribute to contamination.
• Food sellers mitigate food safety risks by cooking meat for half an hour or more.

Whole genome sequencing is now in progress to see whether Salmonella in meat contributes to disease burden in people. Results from sequencing will inform food safety advice.

The work continues
A new project extending the work of LLH was funded by the University of Edinburgh as part of the Bill and Melinda Gates Foundation-funded Supporting Evidence-Based Interventions to Achieve Agricultural Development Goals (SEBAG) programme. This makes use of the Zoonoses Lab at KCRI set up by LLH. The lab will test SEEDZ samples for pathogens linked to livestock abortion. The work will help to develop disease surveillance in northern Tanzania by establishing a surveillance platform to investigate abortion events, with the aim of developing effective and sustainable intervention strategies to reduce mortality in cattle, sheep and goats.

The Zoonoses Lab and NM-AIST are involved in a new project on Supporting the National Action Plan on Antimicrobial Resistance (SNAP-AMR), funded by the Medical Research Council (MRC) and led by members of Glasgow’s LLH team.

Reporting back to stakeholders
“Is it my first time in 25 years working experience to receive feedback from researchers so we thank you very much and send our message to our sponsors and universities. We welcome you again!” Extension officer giving a vote of thanks following a HAZEL feedback event.

Reporting back to stakeholders was both a courtesy, to offer thanks to all those who helped the researchers, and fundamental for the three projects’ objectives of ensuring that findings can make a difference. Key messages were passed both to those who could directly benefit from those messages as well as practitioners and policymakers for whom it could inform their work. Among other activities:
• HAZEL held feedback sessions with poultry farmers and extension officers to share results and raise awareness of biosecurity and health management.
• SEEDZ re-visited all study communities, providing feedback on the study and information on zoonoses prevention through locally-designed advice sheets (detail, left and below).
• Brucella held a feedback meeting for the community in Endulen where they worked and also organised an end of project party.

Influencing at the highest levels
LLH team members attended workshops to put into operation the Tanzania One Health Strategic Plan 2015-2020. They contributed to the zoonoses prioritisation exercise for Tanzania, which included Rift Valley fever (RVF) and brucellosis, and provided support for the development of surveillance guidelines for these two diseases.

LLH research contributed to Tanzania’s National Action Plan for Health Security 2017-2022. Team member Dr Emmanuel Swai continues to serve as a focal point and member of the Technical Working Group for Zoonoses and Surveillance Technical Areas for the Action Plan.

Dr Jo Halliday hosted an international workshop, ‘Brucellosis control in sub-Saharan Africa - what next?’, to share details and identify knowledge gaps on brucellosis control. It brought together representatives from Tanzania, Ethiopia, Kenya and Senegal, as well as the five ZELS projects working on the disease.

Livestock, Livelihoods and Health is led by the University of Glasgow. Other partners are:
UK: The STEPS Centre (Institute of Development Studies and University of Sussex), Animal and Plant Health Agency and Quadrum Institute, Tanzania: Nelson Mandela African Institute of Science and Technology, Kilimanjaro Christian Medical Centre, Kilimanjaro Clinical Research Institute, Sokoine University of Agriculture, Ministry of Agriculture, Livestock and Fisheries, National Institute for Medical Research, Tanzania Wildlife Research Institute, Tanzania Veterinary Laboratory Agency, Global Animal Health, Tanzania, and Food and Agriculture Organization of the United Nations in Tanzania (FAO Tanzania); New Zealand: University of Otago and Massey University; USA: Washington State University and International: FAO.

2017 saw things start to come together for LLH. Researchers wrapped up their fieldwork in northern Tanzania and the work of interpreting results and writing up began. The three projects comprising LLH – Social, Economic and Environmental Drivers of Zoonoses in Tanzania (SEEDZ), Hazards Associated with Zoonotic enteric pathogens in Emerging Livestock meat pathways (HAZEL) and Molecular epidemiology of brucellosis in northern Tanzania (Brucella) – entered their final year. All turned their thoughts to issues surrounding research into use and impact, with plans for maximising these made at project workshops held in September in Glasgow.

The ZELS is funded by the Biotechnology and Biological Sciences Research Council, the Defence and Science Technology Laboratory (Ministry of Defence), the Department for International Development, the Economic and Social Sciences Research Council, the Medical Research Council and the Natural Environment Research Council.

ZELS is supported by the UNESCO Chair in Livestock, Livelihoods and Health.