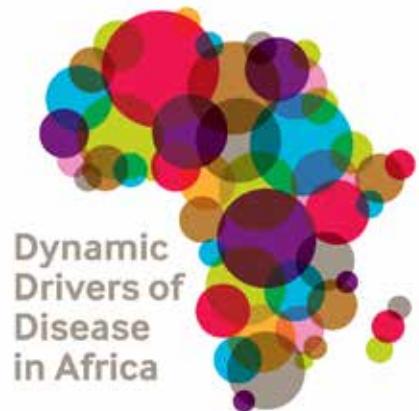


Focused fly elimination campaigns give farmers hope for safe new settlement lands



Accurate multidisciplinary mapping of tsetse distribution in the Zambezi Valley has shown policymakers a more effective and cheaper route to protecting poor, rural people from a disease that can devastate livelihoods.

IN ZIMBABWE, the problem of trypanosomiasis is serious yet also widely underestimated. The disease in people causes sleeping sickness, which is fatal if left untreated. In animals it causes *nagana*, which severely affects livestock productivity. It is transmitted by a parasite via the tsetse fly.

Work by the Dynamic Drivers of Disease in Africa Consortium has shown that between 5% and 10% of tsetse in the Zambezi Valley carry the trypanosomiasis parasite. Yet the seriousness of the problem is largely hidden. Local people sometimes fail to report human outbreaks, often because sleeping sickness is easily

confused with malaria. The disease is also occasionally attributed to sickness caused by witchcraft, and again such cases are not reported.

Our researchers wanted to know the distribution of tsetse, both spatially and temporally, and the range of impacts the disease had on people and their livelihoods.

Our research project was multidisciplinary, involving sociologists, geographers and entomologists. And our methods were varied, employing social surveys to capture demographic issues, and participatory mapping with traditional leaders, migrants, indigenous people and squatters to map disease across time. Huge blood sampling surveys for animals were undertaken, and GIS was used to characterise the distribution of tsetse across time. Surveys were processed locally and laboratory work was shared between the University of Edinburgh and the Department of Livestock and Veterinary Services (DVLS) in Zimbabwe.

Our findings were two-fold and have considerable policy



Trapping the tsetse fly *Image: Vupenyu Dzingera*

implications. They were, first, that tsetse persist, but also that the fly is increasingly confined to low-lying areas, waterways and thick bushes. These patches have water, pastures and wildlife – an ideal combination for the tsetse. Most sleeping sickness cases seem to be confined to the tsetse-wildlife-human interface above the Zambezi escarpment in the Chemakunguwo safari hunting area.

Cattle industry

Trypanosomiasis transmission, it seems, occurs when people encroach into these fly-ridden patches. Sometimes too, though, wildlife breaks out of them. Through the CAMPFIRE initiative, a community-based natural resources management programme, these animals are allowed to roam into villages, thereby bringing the fly with them. In this way, even goats and cattle in settled areas can become infected.

These findings have policy implications. In the past, control measures have frequently targeted huge swathes of landscapes for tsetse eradication. Our work though suggests there are only small patches of risk, and that it is these areas which must be targeted for localised elimination campaigns. By focusing on these high-risk patches, government can ensure the problem is dealt with effectively, allowing for safe settlement to take place in the cleared areas. This could be a major contribution to poverty alleviation in Zimbabwe, where land for settlement and farming is in short supply.

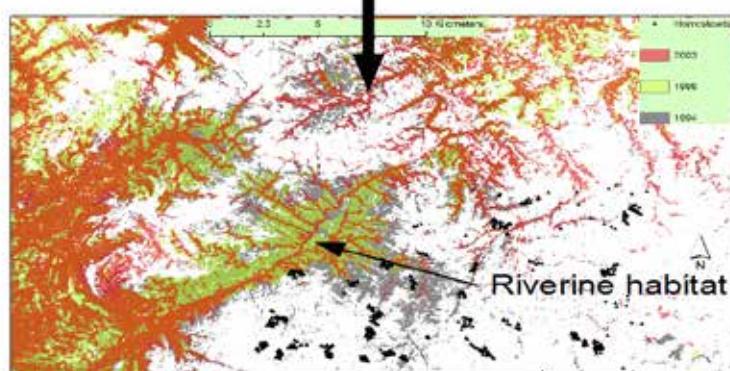
This more targeted approach to tsetse control could not only be more effective than mass eradication efforts, it could also save government money. In addition, Zimbabwe's cattle industry, worth US\$24m, could be safeguarded.

These findings have been conveyed to policymakers. Consortium partner Mr William Shereni, Director of Tsetse

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Control Division in the DVLS, has taken the findings direct to legislators and senior government representatives. He further emphasised the importance of the findings when he took his Deputy Minister to the field site to discuss the patch hypothesis with a view to guiding tsetse eradication. Wider regional impact can also be expected. Mr Shereni presented the team's findings at the 2014 Pan African Tsetse and Trypanosomiasis Eradication Campaign meeting which was attended by senior government leadership from other countries where tsetse is a problem.

This is one of a series of impact case stories produced by the Dynamic Drivers of Disease in Africa Consortium, an ESPA-funded research programme designed to deliver much-needed, cutting-edge science on the relationships between ecosystems, zoonoses, health and wellbeing with the objective of moving people out of poverty and promoting social justice. Find more info at www.driversofdisease.org.



Evidence of receding suitable tsetse habitat between 1994, 1999 and 2003 in relation to human settlement. Map: Farai Matawa