Controlling African Trypanosomiasis in Livestock in Proximity to Wildlife

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African trypanosomiasis is a disease that affects humans and livestock. It is a protozoan disease that is spread by the tsetse fly. Nagana, as the disease is called in cattle, causes lethargy, wasting and death if untreated. The disease is challenging to control because the protozoan can cycle within wildlife populations, which do not seem to be affected by the infections. Additionally, the protozoan will increase in virulence if cycling only within a domestic livestock population.

For this study, we adapt previously published SIR models to include three populations: vectors, livestock and wildlife. The model is parameterized using information from the Hluhluwe-iMfolozi Park in the northern KwaZulu-Natal Province of South Africa. The model will include a parameter for treating the cattle with insecticide as is common practice in attempting to control this disease. We will assess the efficacy of this technique as a function of proximity to the wildlife populations.