

## **African Trypanosomiasis and the compounding effects of error and uncertainty on control efforts**

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### **Abstract**

African Trypanosomiasis is a vector borne parasitic disease passed cyclically by the bite of the tsetse fly. Also known as sleeping sickness, African Trypanosomiasis has been a scourge across Sub-Saharan Africa since Biblical times. As k-strategists, tsetse flies are well adapted to their environments with distributions largely controlled by conditions such as climate, food sources, and soil moisture. With modern high temporal resolution collections of remotely sensed data it has become possible to predict populations over space and time.

Using a dynamic spatial simulation model to explore this disease system, we uncovered the widely varying spatio-temporal patterns that tsetse exhibit. These new tools also have allowed us to explain systematic failures of past disease control policy, that are at least in part, the product of error and uncertainty. Despite spending many millions of dollars on control activities, most have offered only temporary disease burden relief, if any at all. This presentation describes this disease system with application to Kenya and offers solutions to the uncertainty inherent in this disease system.