Modeling the Spread of Disease in Africa

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Introduction

Disease is one of humanities biggest setbacks, and luckily, modern medicine has revolutionized the way we address it. Unfortunately, many countries still have limited access to such resources, and disease is often rampant among their populations. Countries like the US commonly offer aid in the form of on-the-ground support and money. The goal of our project was to model the distribution of aid as a formulation of state-space search using a heuristic function to evaluate effectiveness of distribution strategies.

State Space

The problem is modeled as a chronological progression. Each state exists at a specific time offset from the initial state, and each transition respresents a constant time increment between starting and ending states. The operators on each state represent a distribution of aid to specific cities via a third party.

The Model

There are several attributes of each state that dictate how the operator transforms it. Within a state, each city has a population partitioned into susceptible, infected, and recovered. This is based on common epidemiology models that use these three quantities to characterize a population.

Previous work

Results

In this section we describe the results.

Conclusions

We worked hard, and achieved very little.