

# **Research Proposal: Modeling/Maximizing ARV Distribution in Rural and Urban Uganda**

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## **1 Introduction**

TASO, The AIDS Support Organization ([tasouganda.org](http://tasouganda.org)), is the leading NGO that works with HIV/AIDS patients in Uganda. They have been partially credited with the rapid decrease in HIV prevalence in the region. Besides providing ARV medication for those infected, the organization also performs education and prevention programs across the country. TASO is located in Kampala, the capital of Uganda. I will be spending my summer there working with the organization and looking at mathematical models to describe the most effective way to distribute ARV medication in the urban and rural villages in Uganda.

## **2 Proposed Research**

For my senior thesis project, I hope to develop a spatial and temporal model that describes the distribution of medication in Uganda due to TASOs strategies. This model will ultimately be helpful in understanding the best way to distribute medication among rural and urban communities, specifically in Uganda. This research is especially needed right now since the Presidents PEPFAR plan puts so much money into donating ARV medication to those infected in Africa. If a good model could be produced to describe the distribution process, it could be optimized to distribute the most medication to the largest number of people. These parameters could then be looked at in terms of the Presidents PEPFAR plan, and can determine if the current plan is making a maximum amount of difference. I would ultimately hope that the model would also incorporate education and prevention strategies, although this may be a secondary goal in the process.

### 3 Prior Research

I will be spending 8 weeks this summer in Kampala working with TASO directly. This will allow me understand the distribution process and potentially how the system works. It may also help me estimate parameter values in order to better predict results with my model. I also have taken a variety of classes that involved differential equation models of biological and spatial systems, like Mathematical Biology (Math 113/114), Applied Analysis (Math 180) and Dynamical Systems (Math 181). I am currently doing research on a mathematical model that describes the spread of HIV in populations. I anticipate learning a lot about the analysis process from this research project, and it might potentially help me in the analysis of my thesis model.