1077-49-2824   **Hem Raj Joshi*** (`joshi@xavier.edu`), Department of Math and CS, Xavier University, Cincinnati, OH 45207. *Reducing HIV Epidemic by Education and Treating it Using Optimal Control.* Preliminary report.

Throughout the world, efforts are being made to decrease the spread of HIV by increasing awareness through education. One of these campaigns presented by Uganda's government was the ABC campaign, which promotes Abstinence, Be Faithful, and Condoms to decrease the spread of HIV. A SIR model will be used to evaluate the effectiveness of educational campaign on the HIV epidemic. The model is a system of ordinary differential equations in which data from Uganda about the epidemic and educational influences will be used to run model simulation.

The rest of our presentation will focus on Optimal Control of HIV using Highly Active Antiretroviral Therapy (HAART). We will modify an existing system of ordinary differential equations (ODEs) to incorporate variables representing typical HAART treatment with two different classes of drugs (reverse transcriptase and protease inhibitors). We will calculate optimal treatment plan and present numerical simulations. We will also discuss the uses and limitations of this type of biological model and other types of models. (Received September 22, 2011)

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