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**Omayra Y Ortega\*** ([omayra.ortega@asu.edu](mailto:omayra.ortega@asu.edu)), Arizona State University, Division of Mathematical and Natural Sciences, 4701 W Thunderbird Rd, Glendale, AZ 85306. *Evaluation of Rotavirus Models with Coinfection and Vaccination.*

Rotavirus diarrhea causes a disproportionate amount of childhood mortality. Approximately 611,000 children die each year due to complications of rotavirus infections. We evaluate rotavirus vaccination using four different methods. We look at the epidemiological history of the disease and vaccination against the disease, then we evaluate the effectiveness of vaccination first using a cost-benefit analysis, then using an ordinary differential equations based model, and last through computer simulations.

We do a traditional cost-benefit analysis to evaluate the costs and benefits of implementing a rotavirus vaccination program in Egypt with the RotaRix vaccine. Our results show that given the current standards of care in Egypt, it would be more cost-beneficial for Egypt not to use the rotavirus vaccine.

We formulate a model of the spread of rotavirus diarrhea based on a continuous time ordinary differential equations model of two viral strains of influenza. We expand this model to include the case of co-infection. We further expand the original model to explore the effects of vaccination.

Our simulations of the models show that the spread of the disease is highly sensitive to the levels of cross-immunity between the strains, and the level of vaccination in the population. (Received July 16, 2008)