Modeling the Effects of Insect Repellent & Vaccination in Controlling Yellow Fever · *Erin Deery, Casey Middleton, and Erin N. Bodine*

Yellow fever is a viral hemorrhagic fever transmitted by the *Aedes aegypti* mosquito, which has historically caused thousands of deaths throughout Africa, the Americas, Europe, and the Caribbean, and continues to pose a threat in Africa, and Central and South America. We developed an ordinary differential equations model of the dynamics of a yellow fever outbreak in a completely susceptible population (modeling both the human and mosquito populations), and examined the use of insect repellent and vaccination as a method of reducing the severity of the outbreak. We examine the conditions under which the disease-free equilibria are stable for the complete model and use uncertainty and sensitivity analysis to quantify the reduction in cumulative infections and deaths due to the frequent use of insect repellent by both susceptible and infectious individuals.