

1125-92-2896

Jemal Mohammed-Awel, Ruijun Zhao, Eric Numfor* (enumfor@augusta.edu) and
Suzanne Lenhart. *Management Strategies in a Malaria Model Combining Human and
Transmission-blocking Vaccines.*

Concurrent use of multiple strategies has been recommended as an effective strategy to reduce malaria and its burden. In this talk, we present a new mathematical model studying control strategies of malaria transmission, where the control is a combination of human and transmission-blocking vaccines, and larvacide (vector control). The existence of a backward bifurcation is established analytically in the absence of vaccination, and numerically in the presence of vaccination. Optimal strategies, using vaccination and vector control are investigated to gain qualitative understanding on how different combinations of these controls should be used to reduce disease prevalence in a malaria endemic setting. Our results suggest that the combination of the two vaccination controls integrated with vector control has the highest impact on reducing the number of infected humans and mosquitoes. (Received September 20, 2016)