1116-92-1950   **Eric Numfor*** (`enumfor@gru.edu`) and **Jemal Mohammed-Awel**. *Optimal Insecticide Treated Bed-net Coverage and Malaria Treatment in a Malaria-HIV Co-infection Model.*

We propose and study a mathematical model for malaria-HIV co-infection transmission and control in which malaria treatment and insecticide-treated nets are incorporated. The existence of a backward bifurcation is established, and the occurrence of such backward bifurcation is influenced by disease-induced mortality, treated bed-net coverage and malaria treatment parameters. To further assess the impact of malaria treatment and insecticide-treated bed-net coverage, an optimal control problem is formulated with malaria treatment and insecticide-treated nets as control functions. Using reasonable parameter values, numerical simulations suggest the possibility of eliminating malaria and reducing HIV prevalence significantly. (Received September 21, 2015)