

1124-92-53

Jemal Mohammed-Awel* (j MohammedAwel@valdosta.edu), 1500 North Patterson Street, Hahira, GA 31698, and **Eric Numfor**. *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 coinfection transmission and control, in which malaria treatment and insecticide-treated nets are incorporated. The existence of a backward bifurcation is established analytically, and the occurrence of such backward bifurcation is influenced by disease-induced mortality, insecticide-treated bed-net coverage and malaria treatment parameters. To further assess the impact of malaria treatment and insecticide-treated bed-net coverage, we formulate an optimal control problem with malaria treatment and insecticide-treated nets as control functions. Using reasonable parameter values, numerical simulations of the optimal control suggest the possibility of eliminating malaria and reducing HIV prevalence significantly, within a short time horizon. (Received August 22, 2016)