
KEVIN CHURCH, University of Ottawa

A comparison of two malaria vector control strategies with impulsive differential equations

We present a mathematical model of malaria and two vector control strategies: spray insecticide at regular, fixed times and spray at times determined by a function of disease incidence. This model is described by a system of nonlinear impulsive differential equations with different impulse conditions for each strategy. Stability of the disease-free periodic orbit is considered, and the existence of an endemic periodic orbit and its stability is established using techniques from local bifurcation theory. The two vector control strategies are compared with respect to short-term implementation cost (number of spraying events) and disease burden reduction using numerical simulations.