
ELAMIN ELBASHA, Merck Research Laboratories

Global dynamics of an HPV vaccination model

We analyze a simple four-dimensional model of the susceptible, infective, and recovered (SIR) type. The model describes the transmission dynamics of human papillomavirus (HPV) infection following the introduction of a mass vaccination program. By constructing suitable Lyapunov functions, we prove that the global dynamics of this model are determined by the reproduction number R_v . If R_v is less than unity, there is a unique infection-free equilibrium which is globally asymptotically stable. For R_v greater than unity, the infection-free equilibrium is unstable, and there is a unique endemic equilibrium which is globally asymptotically stable. Future extensions of the model will be discussed.