

Modelling the Spread of HIV/AIDS Epidemic with Condom Campaign and Treatment

Authors : Marsudi, Noor Hidayat, Ratno Bagus Edy Wibowo

Abstract : This paper considers a deterministic model for the transmission dynamics of HIV/AIDS in which condom campaign and treatment are both important for the disease management. In modelling of the spread of AIDS, the population is divided into six subpopulations, namely susceptible population, susceptible population who change their behavior due to education condom campaign, infected population, pre-AIDS population, treated population and full-blown AIDS population. We calculate the effective reproduction number using the next generation matrix method and investigate the existence and stability of the equilibrium points. A sensitivity analysis discovers parameters that have a high impact on effective reproduction number and should be targeted by intervention strategies. Numerical simulations are given to illustrate and verify our analytic results.

Keywords : HIV/AIDS, condom campaign, antiretroviral treatment, effective reproduction number, stability and sensitivity analysis

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