

Mathematical Modelling of the role of Interference on the Transmission Dynamics and Management of HIV and Aid.

Abstract

In this paper, a deterministic mathematical model incorporating interference is developed and analysed to investigate the role of interference on the transmission dynamics and management of HIV and AIDS. The model is shown to be positively invariant as well as bounded. The endemic state is shown to exist provided that the reproduction number is greater than unity. Furthermore, by the use of Routh-Hurwitz criterion and suitable Lyapunov functions, the endemic states are shown to be locally and globally asymptotically stable. This implies that disease transmission levels can be kept quite low or manageable with minimal deaths at the peak times of the re-occurrences. Numerical simulations indicate that minimal interference against the disease lowers the rate of infection and enhances the disease management.

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