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Dynamical system of HIV infections among female sexual workers and injecting drug users with treatment and prevention

In this paper, a model for the human immunodeficiency virus (HIV) infection among female sexual workers and injecting drug users is formulated. The injecting drug users (IDUs) are also considered as clients, therefore there are two transmission routes considered in this model: needle sharing between IDUs and commercial sex between female sex workers and IDUs as clients. This model also incorporates a treatment for the infected population and a prevention for the susceptible population. The qualitative analysis are also presented. The local stability are obtained by analyzing the epidemic threshold R_0 . The result shows that the disease-free equilibrium is locally asymptotically stable when the condition $R_0 < 1$ is satisfied and a unique endemic equilibrium exists and it is locally asymptotically stable if $R_0 > 1$. The numerical simulations are also performed to support analytical result.

Primary author: Ms SETIAWATY, Rafiqah (Bogor Agricultural University)

Co-author: Mr SIANTURI, Paian (Bogor Agricultural University)

Presenter: Ms SETIAWATY, Rafiqah (Bogor Agricultural University)

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