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Qualitative behavior of HIV-1 delayed model with apoptosis and cure rate

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This study investigated the effects of apoptosis and cure rate delay on the qualitative behavior of a nonlinear functional response human immunodeficiency virus infection model. A novel feature is that both Apoptosis and Cure Rate are incorporated into the model. The basic reproduction number R_0 is used to make conclusions based on the model outcomes. We established that the infection free equilibrium and the chronic infection equilibrium are locally asymptotically stable if $R_0<1$ and $R_0>1$, respectively. This was done by using the characteristic equation of the model and Ruth Hurwitz criterion. We conclude by providing numerical simulations that demonstrate our findings.

Keywords: Basic reproduction number, HIV -1 infection, Cure Rate, Local stability, Mathematical delay.

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