

# Optimal Control in Stochastic Model with Short Message Service to HIV/AIDS patients under ARV

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## Abstract

In this paper, we treat an application of a optimal control problem to the stochastic dynamic system in epidemic. We consider a HIV/AIDS stochastic dynamic model with anti retro viral (ARV)-therapy. This model is formulated and is analyzed previously in [11]. Our objective is to minimize the newly infection cases. ARV-therapy is a curative measure of HIV/AIDS patients. It presents until there the therapeutic effect efficient, even in the cases of resistances. This treatment measure associated to the preventive measures as HIV-Testing and Counseling (HTC), i.e. test technology and education, sensitization campaign on change sexual behavior among people that run the risk, especially, the strategy of quick-alert by Short Message Service (SMS) to patients by the care service, for to ensure that these take their treatment effectively, are again the optimal strategies of the control that permits to reduce the new cases of infection. Thus, we introduce three additional variables in a stochastic dynamic proposed in [11] to act on the proportions of HIV/AIDS patients under ARV by the optimal strategies for the purpose to reduce the prevalence and the incidence. A minimization problem of newly infection cases of HIV/AIDS is formulated and solved analytically and numerically via Bellman's principle. The numerical results of this controlled dynamics are also described.

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figures/ModStocVIHAIDSMSControl/ModStocVIHAIDSMSControl-eps-converted-to.pdf



















