1135-60-1066 **Olusegun Michael Otunuga*** (otunuga@marshall.edu), Dept. of Mathematics, SH 523, One John Marshall Dr, Huntington, WV 25755. *Global stability for a system of HIV epidemic stochastic model with treatments.* Preliminary report.

In this work, we derive and analyze a $2n+1$-dimensional stochastic differential equation modeling the transmission and treatment of HIV (Human Immunodeficiency Virus) disease. A theoretical treatment strategy of regular HIV testing and immediate treatment with Antiretroviral Therapy (ART) is investigated in the presence and abence of noise in the transmission rate. We discuss the asymptotic stability of the infection-free and endemic equilibrium (denoted by P_0 and P_1, respectively) by first deriving the closed form expression for the deterministic infection-free basic reproduction number, $R_{0,n}$, and the endemic elimination threshold parameter, $R_{t,n}$. In the presence of noise, we derive closed form expression for the stochastic infection-free basic reproduction number, $\mathcal{R}_{0,n}$, (in the case without treatment) and the endemic elimination threshold, $\mathcal{R}_{t,n}$, (with treatment) and show that epidemic can grow initially (if $\mathcal{R}_{0,n} > 1$ and $R_{0,n} < 1$) because of the presence of noise in the transmission rate. A numerical simulation is presented for validation. (Received September 19, 2017)