



## A SHOCK MODEL APPROACH FOR ESTIMATING THE EXPECTED TIME TO SEROCONVERSION OF HIV INFECTED USING EXPONENTIATED MODIFIED WEIBULL DISTRIBUTION

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### ABSTRACT

*A Stochastic modelling of biological systems is crucial to effectively and efficiently developing treatments for medical conditions that plague humanity. The study of HIV infection, transmission and spread of AIDS is quite common by the use of stochastic models. The estimation of expected time to seroconversion of HIV infected over the time interval  $(0, t]$ , is an important aspects which helps medical intervention. The human immune system collapses very much based on the antigenic diversity of the antigen namely HIV attained in each successive contacts and it occurs leading to seroconversion. In this paper focuses on the study of a stochastic model for predicting the seroconversion time of HIV transmission under the assumption that the threshold level of antigenic diversity is a random variable follows exponentiated modified Weibull distribution. The mean time to seroconversion and its variance are derived and the numerical illustrations are provided.*

**Keywords:** Acquired Immuno Deficiency Syndrome, Human Immuno-deficiency Virus, Seroconversion, Antigenic Diversity Threshold and Cumulative Damage Process