1163-60-232 **Aubain Hilaire Nzokem*** (hilaire77@gmail.com) and **Neal Madras** (madras@yorku.ca). *SIS Epidemic Model : Birth-and-Death Markov Chain Approach.*

We are interested in describing the infected size in the SIS Epidemic model using Birth-Death Markov processes. The Susceptible-Infected-Susceptible (SIS) model is defined within a population of constant size (M); the size is maintained by replacing each death with a new born healthy individual. The life span of each individual in the susceptible population (S) and the infected population (I) is modelling by an exponential distribution with parameter α; and the disease spreads within the population with the transmission rate (β). As methodology, we use both numerical and analytical approaches; The analysis relies on the limiting stationary distribution (π_M) of Markov chain developed by Taylor and Karlin (1975) for Birth and Death processes.The numerical method uses sample path simulations to show the relationship between infected size and Reproduction number ($R = \frac{\beta}{\alpha}$); some stable statistical characteristics of the infected size will be estimated. The analytical method uses the poisson distribution proprieties, the Taylor series technique and the local central limit theorem to show that the infected size follows a normal distribution with mean $\mu = (1 - \frac{1}{R})M$ and variance $\sigma^2 = \frac{M}{R}$ when M becomes big. (Received August 29, 2020)