

ABSTRAK

Dalam skripsi ini dikaji kestabilan model SEIQR pada penyebaran COVID-19. COVID-19 merupakan penyakit infeksi pernapasan yang disebabkan oleh SARS-CoV-2. WHO menetapkan COVID-19 sebagai pandemi, karena penyebarannya yang cepat dan luas. Dalam penelitian ini, penyebaran COVID-19 berdasarkan waktu dapat diketahui dengan menggunakan model matematika, yaitu model SEIQR (*Susceptible, Exposed, Infected, Quarantinned, Recovered*). Model tersebut memiliki dua titik tetap, yaitu titik tetap bebas penyakit dan titik tetap endemik. Berdasarkan analisis kestabilan, titik tetap bebas penyakit stabil asimtotik jika bilangan reproduksi dasar $R_0 < 1$ dan titik tetap endemik stabil asimtotik jika bilangan reproduksi dasar $R_0 > 1$. Simulasi numerik dilakukan untuk melihat jumlah subpopulasi *Susceptible, Exposed, Infected, Quarantinned dan Recovered*.

Kata Kunci : COVID-19, kestabilan, model SEIQR.

ABSTRACT

This thesis examines the stability of the SEIQR model on the spread of COVID-19. COVID-19 is a respiratory infection caused by SARS-CoV-2. WHO declared COVID-19 a pandemic, due to its rapid and widespread spread. In this research, the spread of COVID-19 based on time can be determined using a mathematical model, namely the SEIQR (*Susceptible, Exposed, Infected, Quarantined, Recovered*) model. The model has two fixed points, namely the disease-free fixed point and the endemic fixed point. Based on stability analysis, the disease-free fixed point is asymptotically stable if the basic reproduction number $R_0 < 1$ and the endemic fixed point is asymptotically stable if the basic reproduction number $R_0 > 1$. Numerical simulations were carried out to see the number of *Susceptible, Exposed, Infected, Quarantined and Recovered* subpopulations.