

ABSTRAK

Penelitian ini bertujuan menganalisis kestabilan model epidemik $SEI_u I_e R$ (*Susceptible, Exposed, Infectious Uneducated, Infectious Educated, Recovered*) untuk menggambarkan dinamika penyebaran penyakit menular dengan menggunakan fungsi insiden Holling tipe II yang merepresentasikan kejenuhan penularan. Analisis dilakukan menggunakan bilangan reproduksi dasar R_0 melalui metode *Next Generation Matrix* serta kriteria Routh–Hurwitz. Hasil analisis menunjukkan adanya dua titik ekuilibrium, yaitu titik ekuilibrium bebas penyakit dan titik ekuilibrium endemik yang masing-masing terbukti stabil asimtotik. Simulasi numerik mendukung hasil analitik dan memperlihatkan pengaruh signifikan parameter kejenuhan terhadap jumlah populasi pada setiap kompartemen.

Kata kunci: *model epidemik, fungsi insiden Holling tipe II, kestabilan ekuilibrium*

ABSTRACT

This study aims to analyze the stability of the $SEI_u I_e R$ (*Susceptible, Exposed, Infectious Uneducated, Infectious Educated, Recovered*) epidemic model to describe the dynamics of infectious disease transmission using the Holling type II incidence function, which represents saturation effects in transmission. The analysis employs the basic reproduction number R_0 , calculated using the *Next Generation Matrix* method, and the Routh–Hurwitz criteria to assess stability. The results show the existence of two equilibrium points, namely the disease-free equilibrium and the endemic equilibrium, each proven to be asymptotically stable. Numerical simulations support the analytical results and demonstrate the significant influence of the saturation parameter on the population size in each compartment.

Keywords: *epidemic model, Holling type II incidence function, equilibrium stability*