

SIFAT KESTABILAN DI SEKITAR TITIK TETAP PADA MODEL MATEMATIKA TRANSMISI PENYAKIT MALARIA

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Abstract

Malaria is an infectious disease, transmitted between humans through mosquito bites, that kills about thousands of people every year. We present a system of ordinary differential equations for the spread of malaria in human and mosquito population. Susceptible humans can be infected when they are bitten by an infectious mosquito. They then progress through the exposed, infectious, and recovered classes, before reentering the susceptible class. Susceptible mosquitoes can become infected when they bite infectious or recovered humans, and once infected they move through the exposed and infectious classes. We define a basic reproductive number, R_0 , for the number of secondary cases that one infected individual will cause through the duration of the infectious period. We find that the disease-free equilibrium is stable when $R_0 < 1$ and unstable when $R_0 > 1$.

Keywords: *malaria transmission, mathematical models, basic reproductive number, disease-free equilibrium.*