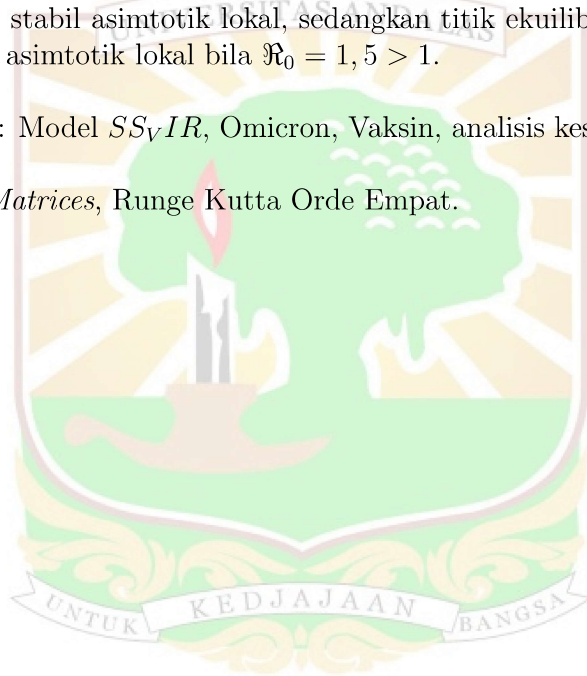


ABSTRAK

Omicron merupakan salah satu varian dari *Corona Virus Disease 2019* (COVID-19), yang penyebaran virusnya lebih cepat dibandingkan varian virus COVID-19 lainnya. Penelitian ini ditujukan untuk menganalisis penyebaran virus Omicron dengan pengaruh laju vaksinasi dan laju tanpa vaksinasi, menganalisis kestabilan lokal di sekitar titik ekuilibrium dengan menggunakan nilai eigen dari matriks Jacobian, menentukan bilangan reproduksi dasar menggunakan metode *Next Generation Matrices*, dan melakukan simulasi numerik dengan metode Runge Kutta Orde Empat. Pada penelitian ini dikonstruksi model penyebaran virus Omicron, SS_VIR (*Susceptible without Vaccine, Susceptible with Vaccine, Infected, Recovery*). Berdasarkan teorema analisis kestabilan lokal, karena $\mathfrak{R}_0 = 0,5 < 1$ maka titik ekuilibrium bebas penyakit (ξ^0) stabil asimtotik lokal, sedangkan titik ekuilibrium endemik (ξ^*) adalah stabil asimtotik lokal bila $\mathfrak{R}_0 = 1,5 > 1$.

Kata kunci: Model SS_VIR , Omicron, Vaksin, analisis kestabilan lokal, *Next Generation Matrices*, Runge Kutta Orde Empat.



ABSTRACT

Omicron is one of the variants of Corona Virus Disease 2019 (COVID-19), which spreads the virus faster than other variants of the COVID-19 virus. This study aimed to analyze the spread of the Omicron virus with the effect of vaccination rate and non-vaccination rate, analyze local stability around the equilibrium point using the eigenvalues of the Jacobian matrix, determine the primary reproduction number using the Next Generation Matrices method and perform numerical simulations using the Runge Kutta method Order Four. To achieve the objective research, we construct a model of the spread of the Omicron virus SS_VIR (Susceptible without Vaccine, Susceptible with Vaccine, Infected, Recovery). Based on the theorem of local stability analysis, since $\mathfrak{R}_0 = 0.5 < 1$, the disease-free equilibrium point is locally asymptotically stable, while the endemic equilibrium point is locally asymptotically stable if $\mathfrak{R}_0 = 1.5 < 1$.

Keywords: SS_VIR Model, Omicron, Vaccine, local stability analysis, Next Generation Matrices, Fourth-Order Runge Kutta

