ABSTRACT

DIAN UTARI, 3125152913. Analysis of the Local Stability of Measles Spread with the Effects of Vaccination and Immigration Factors. Thesis. Faculty of Mathematics and Natural Science Jakarta State University. 2020.

Measles is an infectious disease caused by the paramyxovirus virus. Measles can be prevented from spreading by vaccination. The spread of measles can be modeled by mathematical modeling. The model of measles disease spread in this thesis is the SVEIR model which consists of 5 compartments namely Susceptible, Vaccinated, Exposed, Infected, and Recovered with the influence of vaccination and immigration factors. The SVEIR mathematical model is analyzed by finding the equilibrium point of the disease, the basic reproduction number (R_0), and the stability of the equilibrium point. The results of the SVEIR model analysis obtained 2 equilibrium points, namely the nonendemic equilibrium point and the endemic equilibrium point. The asymptotic stable nonendemic equilibrium point if $R_0 < 1$, this shows that for a long time, the population infected with measles will decrease or even disappear so that measles does not exist anymore in the population. Whereas the endemic equilibrium point is stable asymptotically if $R_0 > 1$, this shows that over time measles will remain in the population.

Keywords *: measles, disease modeling, local stability, basic reproduction numbers, asymptotically stable.*