

UNIVERSITI TEKNOLOGI MARA

**A SUSCEPTIBLE-INFECTED-RECOVERED
MODEL OF TUBERCULOSIS TRANSMISSION**

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DECLARATION

I certified that this report and the research to which it refers are the product of my work and that any ideas or quotation from the work of other people, published or otherwise are fully acknowledged in accordance with the standard referring practices of the discipline.



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ABSTRACT

Tuberculosis (TB) is a disease that is spread through bacteria and is highly contagious. TB attacks any part of the organs in the body such as the brain and spine. Transmission of TB bring danger to the human population. The main objective of the study is to analyse the dynamics of TB transmission using the Susceptible-Infected-Recovered (SIR) model. SIR model is a mathematical system of nonlinear differential equations. The main objectives are to analyse the mathematical model, compute the basic reproduction number, determine the critical points of the model, and evaluate the SIR on TB transmission trend in MAPLE software with different parameter values. The result of the basic reproduction number is $R_0 > 1$, which subsequently increases the spread of disease. The critical points are unstable because the eigenvalues are positive values. Moreover, this study obtained asymptotically stable equilibrium endemic globally because $R_0 > 1$. The finding also shows that parameter values affected the trend SIR model. Furthermore, the infected class influenced the susceptible and recovered class. In conclusion, the SIR model can be used to analyse the dynamics of the TB transmission.

Keywords: SIR, Tuberculosis, Basic reproduction number, Critical points, Stability.

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