

Universiti Teknologi MARA

**Forecasting on Tuberculosis (TB): A
Comparison Between ARIMA and Holt
Winter's Exponential Smoothing Models**

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STUDENT'S DECLARATION

I certify that this report and the research to which it refers are the product of my own work and that any ideas or quotation from the work of the 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 contagious disease. Around 10 million people in this world are ill with TB every year. TB can affect anyone, both adults and children. Globally, 1.7 billion people are estimated to be infected by TB through Mycobacterium Tuberculosis which spread in the air. In Malaysia, TB is one of the most serious diseases and it was the number one fatal disease in the early 1940s and 1950s. The number of TB cases is increasing each year until prevention can be discovered. This study has been conducted to forecast the number of tuberculosis (TB) cases in Malaysia for 3 years, between 2018 to 2020. This study uses the Autoregressive Integrated Moving Average (ARIMA) and Holt Winter's Exponential Smoothing models, and compares which one of the forecasting models is the most accurate model to predict TB cases in Malaysia. This study uses secondary data, that are the monthly number of TB cases in Malaysia from 2013 until 2017. The ARIMA(2,1,1)(1,0,0)₁₂ model is found to be the best forecasting model. This ARIMA model has the lowest RMSE and MAPE compared to Holt Winter's Exponential Smoothing model. The forecast value for the years between 2018 to 2020 is expected to increase annually. Future research is recommended to analyze the number of cases for a longer period of time and find preventive measures in order to curb the increasing number of the cases.

Keywords: Forecasting, ARIMA, Holt Winters, Tuberculosis, Disease

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