A Spread of Covid-19 in Kedah by Using Sir Model

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ABSTRACT

Covid-19 is a major global health threat that causes severe acute respiratory syndrome (SARS), is highly contagious, and has a high mortality. This study investigates the efficacy of the modelling approach on the pandemic caused by the spread of the novel Covid-19 disease and develops a susceptible-infected-recovered (SIR) model that provides a theoretical framework to investigate its spread within a Kedah community. This system was used to gain more insight into the long-term outcomes of Covid-19. As a case study, the Covid-19 transmission dynamics are investigated using daily confirmed cases in Kedah, where certain epidemiological parameters (such as β infection rate and r as removal rate) of this system are estimated based on the fitting of the model to accurate Covid-19 data released by the Malaysian Ministry of Health (MoH). The SIR model, in particular, can provide insights and predictions about the spread of the virus in communities that the recorded data alone cannot. It demonstrates the significance of modelling the spread of Covid-19 using the SIR model proposed here, as it can aid assessing the disease's impact by providing valuable predictions. However, this study proposes several parameters related to the spread of Covid-19 and the number of susceptible, infected, and recovered populations from the 10 May to 30 May 2022. By comparing the recorded data with the data from the modelling approaches, it was determined that the spread of Covid-19 can be contained in all communities under consideration if appropriate restrictions and firm policies are implemented to control the infection rates as soon as the disease begins to spread.

KEYWORDS: Covid-19, SIR model, Infectious disease, Forecasting, Kedah