A mathematical model to assess COVID-19 vaccination in Thailand

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Abstract

In this article, a COVID-19 transmission mathematical model incorporating vaccination and non-pharmaceutical interventions was formulated and theoretically analysed. Here, the COVID-19 free and endemic equilibrium points, vaccine reproduction number were computed. The derived vaccination reproduction number largely depends on vaccine efficacy for disease eradication to occur. Infection risk is significantly reduced whenever the vaccine intake is greater than one dosage. The simulation results indicate that the administered COVID-19 vaccines and non-pharmaceutical interventions have been effective for the current variants, additional efforts such as a third vaccine booster shot should be considered and implemented to greatly mitigate the risk of the emerging variants of the COVID-19 pandemic.

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Disease free Equilibrium

Endemic Equilibrium

WITHOUT VACCINATION

WITH VACCINATION