

Mathematical Model for understanding the spread of COVID-19 in Saudi Arabia
with access to vaccination

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In this research paper, an extended SEIQRV model to study the spread of COVID-19 in the Kingdom of Saudi Arabia (KSA) with vaccination is proposed. Specifically, a mathematical analysis is carried out to illustrate the non-negativity, boundedness, epidemic equilibrium, existence, and uniqueness of the endemic equilibrium, and the basic reproduction number of the proposed model was calculated. Furthermore, MATLAB was used to find the numerical simulation of the model, and actual data of COVID-19 cases and vaccinations was used to validate our numerical model.

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