



ASSESSING THE IMPACT OF VACCINATION REPRODUCTION NUMBER AND ENDEMIC EQUILIBRIUM ON CONTROLLING THE SPREAD OF COVID-19: A SENSITIVITY ANALYSIS

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Abstract. In this research paper, we present an enhanced SEIR mathematical model tailored to investigate the dynamics of COVID-19 transmission, considering the influence of vaccination. Our study aims to achieve several objectives, including examining the stability and existence of equilibrium points, performing a sensitivity analysis of the vaccination reproduction number (R_v) and endemic equilibrium, and identifying crucial parameters that impact the transmission and prevalence of COVID-19. The outcomes obtained from our analytical-numerical approach are presented through graphical representations, illustrating the theoretical analysis. Moreover, we discuss the implications of our model results on public health, raising important points for further discussion and validation.

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