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COVID-19 DYNAMICS WITH TIME DELAY MODEL CONSIDERING SUPER IMMUNITY

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Abstract. This page details many responses to the ongoing COVID-19 pandemic, including COVID dodgers, hybrid resistance, and public cleanliness initiatives. To Analyze how COVID-19 vaccines execute in terms of thwarting infection, severe disease, and hospitalization through various populaces.The Immunological Responses were investigated by cramming the resistants elicited by vaccines, comprising antibody creation, T-cell stimulation, and the robustness of these retorts over time. The impact of the new variants was examined by the virulence effect on vaccine-induced immunity and whether recent vaccines persist effective to these variants.Long-term Resistance which explores the the extent of protection provided by inoculations, plus how long antibodies last and the necessity for booster shots. Breakthrough infections arise after vaccinating susceptibles are to understand the physiognomies and influences linked with these instances.We aimed to equate the immune responses with time delay of vaccinated individuals set against those who have recuperated from COVID-19 to weigh natural immunity. The primary hypothesis is that the most effective disease control methods have proliferated due in part to the use of epidemiology's mathematical models. This motivates us to create a fractional mathematical model that takes into consideration the intrinsic defences of dodgers and hybrid immune individuals as well as effective vaccination. In this study, we verify that the constructive bounded results for the projected model are unique. The stability of equilibriums that are both endemic and devoid of disease can be accessed. To take the effects of the parameters into consideration, we additionally evaluate the sensitivity measure. This study lends credence to the idea that retention is impacted by fractional order.

Keywords. Time-delay, COVID-dodgers, Hybrid immunity, Vaccination, Stability.

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1 Introduction

Vaccination saves millions of lives every year and has avoided 3.5 million deaths in the last 200 years. It is the development measure for universal