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Global stability of a mathematical pandemic model with immigration and loss of immunity

Abdessamad Tridane

Department of Mathematical Sciences, College of Sciences, United Arab Emirates University, Al Ain, United Arab Emirates

a-tridane@uaeu.ac.ae

Population mobility is one factor contributing to the persistence of the COVID-19 pandemic. This work aims to investigate the global stability of a mathematical model of COVID-19. The main features of this model are the restriction of mobility for the infected population, including the immigration of individuals, and considering the individuals who lose their immunity. Hence, we investigate the global stability of SEIR and SEIRS models. As a result, we proved the global asymptotically stability of the first model via a Lyapunov function and using the Volterra–Lyapunov matrix method for the second model.