Analyzing the Early Stage of COVID-19 Transmission in Sri Lanka via a Multi–patch Compartmental Model

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The main focus of this work is modelling the spread of COVID-19 within a multi-patch environment. The proposed model incorporates the short-term mobility and a mobility matrix. A SQIHR model including close contact tracing combined with human mobility within patches is discussed. Different scenarios of the imposed mobility restrictions are illustrated with the numerical simulations for the early stage of disease spread in Sri Lanka. The spread of the disease from a hot-spot to the local areas with no initial disease is numerically illustrated. Furthermore, the effectiveness of the close contact tracing of an infected patient is also addressed.

Keywords: COVID-19, multi-patch compartmental model, mobility matrix, contact-tracing with mobility restrictions