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Use of mathematical modelling in COVID-19 dynamics and control

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The present novel coronavirus (SARS-CoV-2) infection creates a global emergency situation by spreading all over the world in a large scale within very short time period. But there is no vaccine, anti-viral medicine for such infection. So at that moment a major worldwide problem is that how we can control this pandemic. On the other hand, India is high population density country, where the coronavirus disease (COVID-19) has started to spread from 1st March, 2020 in a significant number of COVID-19 positive cases. Due to high population density human to human social contact rate is very high in India. So controlling pandemic COVID-19 in early stage is very urgent and challenging problem of India. Generally, mathematical models are employed to study the disease dynamics, identify the influential parameters and access the proper prevention strategies for reduction outbreak size. In this work, we have formulated a deterministic compartmental model to study the spreading of COVID-19 and estimated the model parameters by fitting the model with reported data of ongoing pandemic in India. Sensitivity analysis has been done to identify the influential model parameters. Basic reproduction number has been estimated from actual data and the effective basic reproduction number is studied on the basis of reported cases. Some effective preventive measures and their impacts have also been studied. Prediction has been given on the future trends of the virus transmission under some control measures. Finally, the positive measures to control the disease have been summarized.

Biography

Uttam Ghosh is an assistant professor of Applied Mathematics in University of Calcutta. His research includes Biomathematics and Fractional calculus. He has 94 publications in reputed national and international journals.

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