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Role of Mathematical Models in COVID-19 Study

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Letter

COVID-19 is a new emerging contagious disease caused by a new novel virus, named severe acute respiratory syndrome coronavirus 2 (SARS-COV-2). SARS-CoV-2 is regarded as the third zoonotic human coronavirus emerging in the current century, after SARS-CoV in 2002 and the Middle East Respiratory Syndrome Coronavirus (MERS-CoV) in 2012 [1]. The virus was first reported in Wuhan, Hubei Province, China in December 2019.The disease is spreading between people globally and has so far claimed hundreds of lives across the globe. The no. of confirmed cases and deaths reported across the world as on 24 July 2020 were 15,257,287 and 628,240 [2]. The disease affects lungs and causes respiratory illness with symptoms like cold, cough, fever and in critical cases difficulty in breathing. In the early stages of such a contagious disease outbreak it is very critical to understand the transmission pattern of the infection. Studying the changes in the transmission pattern over time can provide better understanding of the epidemiological situation, which is very important to stop the spread the COVID-19 in new areas by timely deployment of countermeasures. Mathematical models have long been used in predicting the epidemiology of a disease and thus plays a vital role in tackling disease outbreaks. Mathematical models are useful to understand the behavior of an infection and to study under what circumstances it will be wiped out or continued. So far, many researchers have come up with different mathematical models to investigate SARS-COV-2 epidemiology and transmission dynamics. Yang et al. [3] recently published an article in which they used a mathematical model to study the epidemic trend of SARS-COV-2 in China. Based on Susceptible-Exposed-Infectious-Removed (SEIR) model and Artificial Intelligence, they predicted the epidemic peaks and sizes. Leung et al. [4] used Susceptible-infectious-recovered model to quantify the transmissibility and severity of COVID-19 in mainland China and to simulate the potential effects of relaxing containment measures in anticipation of a possible second epidemic wave. Zeb et al. [5] developed a mathematical model to investigate the dynamical behavior of COVID-19 infection by including isolation class and concluded that potential cause of SARS-COV-2 outbreak is human to human contact and isolation of the infected person can reduce the risk of future COVID-19 spread. All these studies have covered a wide range of epidemiological characteristics associated with COVID-19 and have improved our understanding of the transmission mechanism of SARS-COV-2 and also showed how mathematical modeling techniques can be employed to study the transmission and spread of COVID-19. With the on-going pandemic, the researchers worldwide are working around the clock to develop potential vaccine for SARS-COV-2 but still there is no certainty about its final appearance. Till then mathematical models may help in controlling the COVID-19 transmission.

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