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# Modeling COVID -19 Daily Infected Cases in the UK

K.M.U.B. Konarasinghe
Institute of Mathematics and Management, Sri Lanka

udaya@imathm.edu.lk

## ABSTRACT

The UK has reported the 4th highest infected cases globally. The UK exceeds 8.4 million cases since 22nd January 2020 and still reporting a higher volume of daily infected cases. The future outbreak of the pandemic might be doubtful. The authorities should examine the future behavior of the outbreak and prepare to minimize the spread of the pandemic to ensure the sleek function of the country. Hence, the study has been designed to forecast the daily infected cases of COVID -19 within the UK to understand the future behavior of the outbreak. The daily confirmed cases of COVID-19 of the UK for the period of 22nd January 2020 to 17th October 2021 were obtained from the World Health Organization (WHO) database. The behavior of the outbreak was identified by Time series plots and Auto Correlation Function (ACF). Sama Circular Model (SCM) was selected to forecast the pandemic by considering the pattern of the outbreak. The fitted model was validated by applying the Anderson Darling test, ACF, and Ljung-Box Q (LBQ)-test. The forecasting ability of the models was assessed by both relative and absolute measurements and errors. They are; Mean Absolute Percentage Error (MAPE), Mean Square Error (MSE), and Mean Absolute Deviation (MAD). The results of the study revealed that the SCM is satisfied with all criteria and the performance of the model was extremely high. Measurements of errors were very low under the model fitting and verification process. It is well observed the repeating behavior of daily infected cases in every 3 days and 8 days. It is recommended to impose and monitor non-pharmaceutical interventions to minimize and control the outbreak of the COVID -19. Further, it is recommended to model the outbreaks of the pandemic in other European countries and identify the repeating behaviors.

**Keywords:** Daily Cases, Repeating Behavior, SCM, COVID-19


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