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Identifying the risk factors for COVID-19 mortality in Sri Lanka using mutual information

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COVID-19 is a pandemic that has taken over the whole world. This virus can easily spread from person-to-person similar to the case with Severe Acute Respiratory Syndrome (SARS-CoV). COVID-19 affects people in different ways majority of the infected people will develop mild to moderate symptoms and recover without hospitalization. As of end of September, there were 516,465 cases and 12,906 deaths in Sri Lanka. The aim of this research is to identify the factors associated with the daily deaths due to COVID-19 in Sri Lanka. In the literature, there are many methods to find factors associated with COVID-19 deaths such as adjusted linear model, logistic regression analyses, and generalized additive model, etc. In this study, the Mutual Information (MI) based method was used to find the factors associated with daily death cases due to COVID-19. The MI was calculated using a *k*-nearest neighbors method. Virus reproduction rate, COVID positive rate, daily vaccinations were collected from the websites of health commissions and temperature, precipitation, specific humidity, surface pressure, and wind speed were collected from the Prediction of Worldwide Energy Resources (POWER) from 13 April 2021 to 30 September 2021 (3rd wave) in Sri Lanka. Based on the results, virus reproduction rate, positive rate, daily vaccination, temperature, specific humidity, and wind speed were significant for the deaths of COVID-19. When the results which were obtained from the suggested MI-based method were compared with the well-known Ordinary Least Square (OLS) method, the same significant factors can be obtained for the deaths of COVID-19. Thus, the suggested MI-based method can be used to find the important factors associated with the deaths due to COVID-19 and to support to implement measures to control the deaths of COVID-19.

Keywords: COVID-19, Mutual Information, Meteorogical factors, Significance, Ordinary Least Square

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