

Correlation between environmental factors and COVID-19 indices: a global level ecological study

Mirahmadizadeh Alireza, Rezaei Fatemeh, Jokari Kimia, Moftakhar Leyla, Hemmati Abdolrasool, Dehghani Seyed Sina, Hassani Amir Hossein, Lotfi Mehrzad, Jafari Alireza , Ghelichi-Ghojogh Mousa

This global level ecological study aimed to investigate the correlation between environmental factors and the COVID-19 indices. This survey is an ecological study, so all studied variables are aggregate variables. To collect the variables in the study, a data set was provided, which includes the information of each country based on the cumulative deaths, case fatality rate, recovery rate, and the number of performed COVID-19 tests. Scatter plots of environmental factors for the studied countries were drawn based on cumulative incidence rate of cases, cumulative incidence rate of death, tests, recovery rate, and case fatality rate of COVID-19. Furthermore, Spearman correlation coefficient was also used to verify the correlation between environmental factors and indicators related to COVID-19. The results of this ecological study showed that among all countries surveyed, Montenegro (60,310.56 per million) and Luxembourg (54,807.89 per million) had the highest cumulative incidence rates of COVID-19 cases, when Tanzania (8.42 per million) and Vietnam (13.78 per million) had the lowest cumulative incidence rates of COVID-19. In addition, in this study, it was shown that the cumulative incidence rate of cases, the cumulative incidence rate of deaths, and performed COVID-19 tests had significant direct correlations with the access to drinking water and the access to sanitation services ($p < 0.001$). The findings of the present study showed an inverse correlation between the mortality rate due to unhealthy water consumption, poor health status, and a positive correlation between access to drinking water and health services with the cumulative incidence and mortality rates of COVID-19. The differences between our findings and many other studies could be due to the ecological nature of the study. Nevertheless, our findings will help health policymakers to develop timely strategies to reduce the mortality and incidence rate of COVID-19.

Keywords: COVID-19 · Coronavirus · Environmental factors · Ecologic study