

Correlation between human development index and its components with COVID-19 indices: a global level ecologic study

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Abstract

Background: Given that COVID-19 continues to spread worldwide, attempts to restrain the virus and to prevent the effects that critically ill patients with COVID-19 have on healthcare systems, has become a public health priority. This ecological study aimed to investigate the correlation between the Human Development Index (HDI) and the epidemiological indicators of COVID-19, including the cumulative incidence rate of cases, the cumulative incidence rate of death, performed COVID-19 tests per million, recovery rate, and case fatality rate.

Methods: In this ecological study, a data set was provided, which included the epidemiologic indices of COVID-19, HDI, and its components for each country. Correlation coefficients were used to determine linear correlation. Also, the scatter plots of the HDI for the studied countries based on the epidemiologic indices of COVID-19 were drawn.

Results: This study showed that HDI and its components had positive correlation with a cumulative incidence rate of cases, the cumulative incidence rate of death, and performed COVID-19 tests ($p < 0.001$). HDI and two of its components, including literacy and Gross National Income (GNI) components had negative correlation with case fatality rate (CFR). Also, HDI and two of its components, including literacy and life expectancy components had negative correlation with recovery rate.

Conclusion: Our study showed that the HDI and its components can affect the epidemiological status of COVID-19. As HDI increased, the cumulative incidence rate of cases, cumulative incidence rate of death, and COVID-19 tests increased as well. As HDI increased, CFR and recovery rate decreased as well. Although the HDI is higher in high-income countries, these countries may have also better reporting and surveillance systems.

Keywords: COVID-19, Coronavirus, Human development index, Ecologic study