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Temporal relation between human mobility, climate, and COVID-19 disease



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Connected Content

A companion article has been published: [Weather and human mobility impact COVID-19 cases](#)

Using the example of the city of São Paulo (Brazil), in this paper, we analyze the temporal relation between human mobility and meteorological variables with the number of infected

individuals by the COVID-19 disease. For the temporal relation, we use the significant values of distance correlation $t_0(\text{DC})$, which is a recently proposed quantity capable of detecting nonlinear correlations between time series. The analyzed period was from February 26, 2020 to June 28, 2020. Fewer movements in recreation and transit stations and the increase in the maximal temperature have strong correlations with the number of newly infected cases occurring 17 days after. Furthermore, more significant changes in grocery and pharmacy, parks, and recreation and sudden changes in the maximal pressure occurring 10 and 11 days before the disease begins are also correlated with it. Scanning the whole period of the data, not only the early stage of the disease, we observe that changes in human mobility also primarily affect the disease for 0–19 days after. In other words, our results demonstrate the crucial role of the municipal decree declaring an emergency in the city to influence the number of infected individuals.

Topics

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