Consequences of modeling assumptions and scope of analysis on connections between meteorology and COVID-19

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Research on past influenza and coronavirus outbreaks demonstrates that the spatiotemporal evolution of transmission exhibits pronounced associations with meteorological variables, such ambient temperature and humidity. There are many open questions regarding the causal pathways that connect the ambient meteorology to the transmission of the novel coronavirus (COVID-19), but evaluating the statistical associations between COVID-19 and meteorology represents an important first step and presents potential challenges and opportunities for controlling the future spread of the virus.
Many recent refereed and non-refereed studies have examined the connection between meteorological variables and COVID-19; however, the landscape of the literature is constantly changing, and it is important to provide a synthesis to evaluate gaps. These studies yield contrasting results linking COVID-19 with meteorology both within and across regions. Differences likely stem from different focus regions and measuring periods, different methodologies (i.e., statistical methods, dependent variable(s), controls, etc.), or a combination of these two factors. To understand how methodology impacts key findings, we discuss how studies draw statistical associations between meteorology and COVID-19 and their intrinsic limitations and suggest ways that future research could improve the detection of associations.

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