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Association between COVID-19, mobility and environment in Brazilian capitals

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Brazil is the country with the highest number of COVID-19 cases and deaths in the southern hemisphere, third behind India and U.S globally. Some studies have analyzed the relationship between mobility, meteorology and air pollution, finding that staying out-of-home increases cases about 5 days and deaths about two weeks after the exposure (Ibarra-Espinosa, et al., 2021). In this work we will extend the analyses presented by Ibarra-Espinosa et al., (2021), by including more Brazilian cities. Specifically, the metropolitan region of Rio de Janeiro is considered a Megacity and monitors meteorology and air pollution, necessary to the analyses. The metropolitan regions of Porto Alegre, Belo Horizonte and Curitiba as well. The method consists in applying a semiparametric model (Dominici et al, 2004), but in this case, controlling all the environmental factors and their interactions and the parameter consists in the mobility alone. We will compare local mobility index, as Google Residential Mobility Index (RMI), as done by Ibarra-Espinosa et al., (2021). Due to the high dispersion of the data, COVID-19 will be modeled by quasi-poisson and negative binomial distribution, with generalized additive models (Wood., 2017; Zeileis et al., 2008; R Core Team, 2021).

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