Universidade de Brasília
Departamento de Estatística

UnB

O Programa de Pós-Graduação em Estatística convida para:

WEBINAR

Piecewise modeling the accumulated daily growth of COVID-19 deaths: The case of the State of São Paulo, Brazil

Prof. Erlandson Ferreira Saraiva (Univ. Federal de Mato Grosso do Sul)

Quinta-feira, 14/10/2021 às 14:30hs de Brasília

O seminário é público e poderá ser assistido pelo Link

https://teams.microsoft.com/l/meetup-join/19.

Resumo

The pandemic scenery caused by the new coronavirus, called SARS-CoV-2, increased interest in statistical models capable of projecting the evolution of the number of cases (and associated deaths) due to COVID-19 in countries, states and/or cities. This interest is mainly due to the fact that the projections may help the government agencies in making decisions in relation to procedures of prevention of the disease. Since the growth of the number of cases (and deaths) of COVID-19, in general, has presented a heterogeneous evolution over time, it is important that the modeling procedure is capable of identifying periods with different growth rates and proposing an adequate model for each period. Here, we present a modeling procedure based on the fit of a piecewise growth model for the cumulative number of deaths. We opt to focus on the modeling of the cumulative number of deaths because, other than for the number of cases, these values do not depend on the number of diagnostic tests performed. In the proposed approach, the model is updated in the course of the pandemic, and whenever a "new" period of the pandemic is identified, it creates a new sub-dataset composed of the cumulative number of deaths registered from the change point and a new growth model is chosen for that period. Three growth models were fitted for each period: exponential, logistic and Gompertz models. The best model for the cumulative number of deaths recorded is the one with the smallest mean square error and the smallest Akaike information criterion (AIC) and Bayesian information criterion (BIC) values. This approach is illustrated in a case study, in which we model the number of deaths due to COVID-19 recorded in the State of São Paulo, Brazil. The results have shown that the fit of a piecewise model is very effective for explaining the different periods of the pandemic evolution. (Joint work with Carlos A. B. Pereira).

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