A discrete-time-evolution model to forecast progress of Covid-19 outbreak

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Here we present a discrete-time-evolution model with one day interval to forecast the propa-gation of Covid-19. The proposed model can be easily implemented with daily updated data sets of the pandemic publicly available by distinct online sources. It has only two adjustable parameters and it predicts the evolution of the total number of infected people in a country for the next 14 days if parameters do not change during the analyzed period. The model incorporates the main aspects of the disease such as the fact that there are asymptomatic and symptomatic phases (both capable of propagating the virus), and that these phases take almost two weeks before the infected person status evolves to the next (asymptomatic becomes symptomatic or symptomatic becomes either recovered or dead). A striking advantage of the model for its implementation by the health sector is that it gives directly the number of total infected people in each day (in thousands, tens of thousands or hundred of thousands). Here, the model is tested with data from Brazil, UK and South Korea, presenting low error rates on the prediction of the evolution of the disease in all analyzed countries. We hope this model may be a useful tool to estimate the propagation of the disease.

Ref.: E. M. F. Curado e Marco R. Curado, PloSONE 15 (2020) e0241472.