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# **A generalized logistic model for Covid-19 spreading**

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## **Abstract**

One of the simplest mathematical models for population growth, the Verhulst logistic curve, is provided to make some prediction on the curve growth of Covid-19 pandemic spread. However, due to the “rigidity” of the logistic curve, a precise forecast can be done only under some very special and well-determined conditions, such as in the case of the time evolution of the infection in China, or, maybe, for seasonal flus. In general, taking into account the halo of randomness associated to each reported daily data and treating the latter as a value of the Brownian motion, we can replace the logistic behavior with a theoretical time series, fairly approximating the real data series. The day of the overlapping between theoretical and real series is what we were looking for, as we show applying this method to Lombardy and its more affected cities: Bergamo, Brescia and Milan. To shorten the calculations to obtain the theoretical values, a linear approximation is provided, a sort of geometric tangent to the data curve in the crucial day, able to dominate the data of the successive evolution of the infection.