

Coursera capstone project

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Covid'19 prediction

The article describe modelling efforts for evaluating the current level of COVID-19 infections in India, using exponential model. The Data from 15 march 2020 to 30 April 2020 are used for validating the model, where intrinsic rise rate is kept constant. It is observed that some states of India, like Maharastra, Gujarat and Delhi have a much higher daily infection cases. This is modelled by assuming an initial higher infections, keeping rise rate same. The sudden outbursts are captured using offset of values for these three states. Data from other states like Madhya Pradesh, Uttar Pradesh and Rajasthan are also analysed and they are found to be following the same constants as India is following. Worldwide, many attempts are made to predict outburst of COVID-19 and in the model, described in this paper, turning point is not predicted, as cases in India are still rising. The developed model is based on daily confirmed infections and not on cumulative infections and rationalization is carried out for the population of various regions, while predicting infections for various states. Assigning a decay constant at this stage will be a premature exercise and keeping that in mind, exponential model predicts that India will attain 1 lakh case by 15 May 2020. The figure of 2 lakh and 3 lakh will be attained on 22 May 2020 and 26 May 2020, respectively.

Effect of measures adopted to prevent the spread of COVID-19:

With the outbreak of the COVID-19 pandemic, various measures have been adopted by the Govt. of India to prevent its spread ([Covid-19.in, 2020](#)). One of the measures is social isolation and lockdown. Social isolation is the complete lack of contact between an individual and society, while, lockdown is an emergency protocol that usually prevents people from leaving an area. These two measures prevent the spread of COVID-19 from effected person to healthy individual to a great extent.

Data-driven methods to predict COVID-19:

The data has been used from 30th January 2020 (when the first case of COVID-19 was reported in India) to 4th April 2020 with 80% data is used for training and rest 20% for forecasting and validation purposes. The resulting plot showing the total number of confirmed cases is shown in . In this figure, the observed data (blue color) is the data used for training purposes (80% of the total data), official data (green line) indicates the official data available and forecasted data (red line) indicates the forecast of a total number of confirmed cases. From this graph, it is observed that the forecasted number of total confirmed positive cases closely matches with the available official data.

Conclusion

In this paper, a data-driven forecasting/estimation method has been used to estimate the possible number of positive cases of COVID-19 in India for the next 20 days. The number of recovered cases, daily positive cases, deceased cases has also been estimated by using Polynomial Regression and curve fitting. The effect of preventing measures like social isolation and lockdown has also been observed which shows that by these preventive measures, spread of the virus can be reduced significantly.