

LOCKDOWN MODELS FOR COVID-19

CONTRIBUTORS

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INTRODUCTION

As of 5 May 2021, India reported 3,78,075 new cases of COVID-19. 47% new cases were reported globally. This data translates to 276 cases per million population.

Presently, India is experiencing the second wave of COVID-19. Morbidity and mortality rates are on the rise. There is an ongoing scarcity of medical facilities including oxygen supply, hospital beds and medicines. COVID vaccination, installation of new oxygen plants, conversion of nitrogen generator to oxygen generator and other initiatives are underway to tackle the growing number of infections.

India could combat the first wave of COVID-19 in 2020 successfully. Complete lockdown and strict restrictions helped in the matter.

This year, however, complacency has been observed in maintaining COVID-19 norms. The question inevitably arises if lockdown is the only way out. In the light of growing 3.5 lakh cases daily, some authorities are in favour of lockdown. Even at the cost of adverse economic consequences.

IQ City Medical College and IQ City Medical College Hospital have conducted this research to explore the different options for lockdown.

OBJECTIVE

To forecast the estimated number of COVID-19 cases per day in India as per the different lockdown models. We have considered this research for 50 days' period - from 10 May to 30 June 2021.

MATERIALS AND METHODS

Data source

The study was conducted with the help of a secondary data set obtained from Coronavirus Source Data.

https://covid.ourworldindata.org/data/ecdc/total_cases.csv Last accessed on 4 May 2021.

MODELS

Auto Regressive (AR), Moving Average (MA), Auto Regressive Moving Average (ARMA), and Auto Regressive Integrated Moving Average (ARIMA) models were used for forecasting.

ASSUMPTIONS TAKEN

Number of people in home quarantine, asymptomatic patients with positive reports, patients in government quarantine places, self-isolation along with lag of test procedure, reduction in government transport facilities, timing of market places and other assumptions were taken into account to fit in the ARIMA model.

RESULTS

We found in absence of blanket lockdown in India, daily cases of COVID-19 will go up initially. The rates will gradually come down to 2,869,64 from 30 June 2021.

If complete lockdown is implemented for 25 days from 6 May to 31 May 2021 in the 6 most affected states, then the daily cases will gradually reduce from 10 May 2021.

On the other hand, if blanket lockdown is implemented in the entire country from 6 May to 31 May 2021, then the daily reported cases will decrease from 2,457,12 (10 May 2021) to 80,469 (30 June 2021) (Table 1)

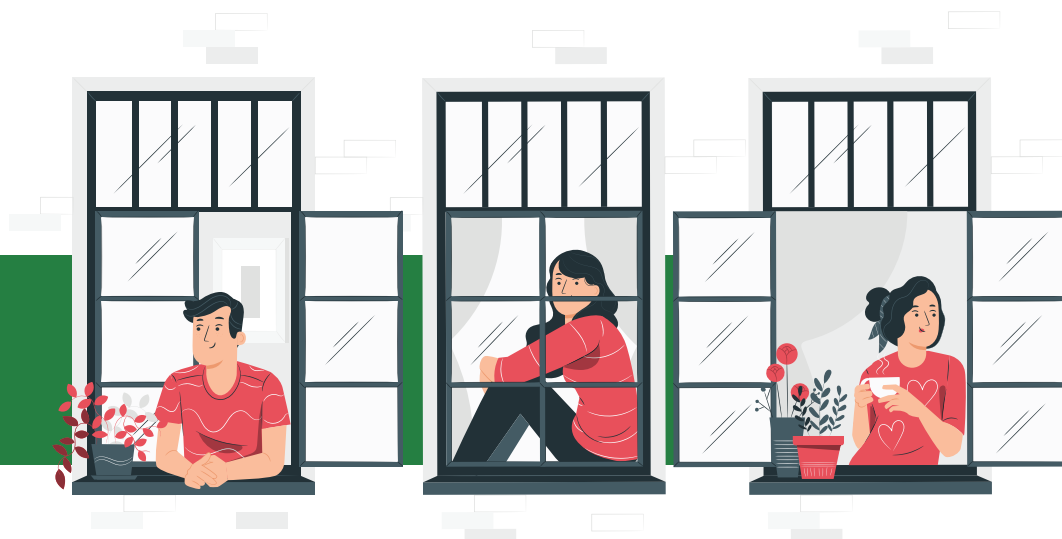


Table 1 predicts daily confirmed cases of COVID-19 in India from 10 May to 30 June 2021.

Date	No lockdown	Complete lockdown for 25 days in the 6 most affected states*	Blanket lockdown in India**
	Daily affected Confirmed cases Number (95% Confidence interval)	Daily affected Confirmed cases Number (95% Confidence interval)	Daily affected Confirmed cases Number (95% Confidence interval)
10.05.21	3,769,84 (3,750,95 – 3,788,73)	3,182,43 (3,169,84 – 3,195,02)	2,457,12 (2,440,28 – 2,473,96)
15.05.21	4,169,21 (4,150,32 – 4,188,10)	3,094,85 (3,082,26 – 3,107,44)	2,158,96 (2,142,12 – 2,175,80)
20.05.21	3,981,72 (3,962,83 – 4,000,61)	2,831,89 (2,819,30 – 2,844,48)	1,905,63 (1,888,79 – 1,922,47)
31.05.21	4,075,62 (4,056,73 – 4,094,51)	2,632,36 (2,619,77 -2,644,95)	1,642,93 (1,626,09 – 1,659,77)
10.06.21	3,617,64 (3,598,75 – 3,636,53)	2,027,08 (2,014,49 – 2,039,67)	1,348,69 (1,331,85 – 1,365,53)
20.06.21	3,016,72 (2,997,83 – 3,035,61)	1,413,08 (1,400,49 – 1,425,67)	1,123,69 (1,106,85 – 1,140,53)
30.06.21	2,869,64 (2,850,75 – 2,888,53)	1,070,90 (1,058,31- 1,083,49)	80,469 (78,785 – 82,153)

*Complete or blanket lockdown for 25 days (6 May - 31 May 2021) in states like West Bengal, Maharashtra, Delhi, Haryana, Rajasthan, and Telangana where the maximum number of positive cases are reported.

**Complete or blanket lockdown for 25 days (6 May - 31 May 2021) for all over the country.

CONCLUSION

Maximum reduction of new cases will be achieved in a complete lockdown model throughout the country.

A particular state-wise lockdown model will also decrease the number of new cases considerably.

RECOMMENDATION

The blanket lockdown model seems to be the best. But this model is very aggressive in terms of economic repercussions. A particular state-wise lockdown model maybe beneficial to a certain extent.

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