

Impacts of Lockdown Interventions on the Spread of COVID-19 in India

Sir,

COVID-19 outbreak caused by SARS-CoV2 has now become a global pandemic and a significant health concern throughout the world.^[1] The first case of COVID-19 was reported in India on January 30, 2020.^[2] Due to burgeoning incidence rate, India is on the second position globally in terms of confirmed cases after the USA. As of September 25, 2020, more than 5.81 million cases along with 92,317 deaths have been reported. The case fatality rate is 1.58% with 70% comorbidities. More than 81% of patients have been recovered (<https://www.mohfw.gov.in>). The Government of India has implemented the lockdown intervention to reduce the transmission of COVID-19 for 68 days in four different phases [Figure 1]. The major interventions include the social distancing, school closure, travel restrictions, border closures, wearing the face masks, quarantine of symptomatic patients, and their contacts. The main purpose of these interventions was to break the chain of transmission and to increase the awareness and to enhance the health infrastructure. Earlier, the lockdown processes have reduced the transmission of disease in China, Italy, Spain, and Australia,^[3-5] however, the impact of lockdown in Indian scenario has not been evaluated yet.

We analyzed the COVID-19 data available on the Ministry of Health and Family Welfare, India. The data were taken before and during the entire lockdown period.

The data suggest that 1 week before the lockdown, COVID-19 cases were increasing, with an average rate of 21.81% per day, which was decreased to 15.44% in the first phase [Figure 2a]. The doubling period was increased from 3.30 to 4.66 days. The average increment in mortality rate was reduced from 21.15% to 19.17% per day [Figure 2b]. The mean rate of recovery was 17.98% per day (ranging from 4.49% to 48.89% on different periods) [Figure 2c].

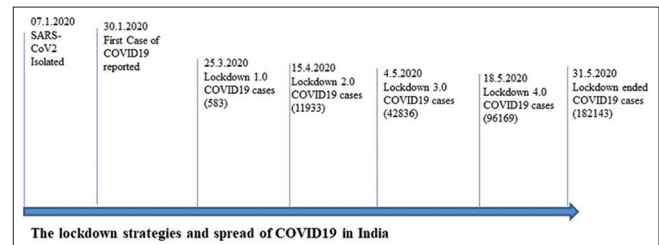


Figure 1: Timeline of COVID-19 spread and lockdown strategies in India. The distributions of COVID-19 cases and lockdown strategies done by the Government of India have been shown

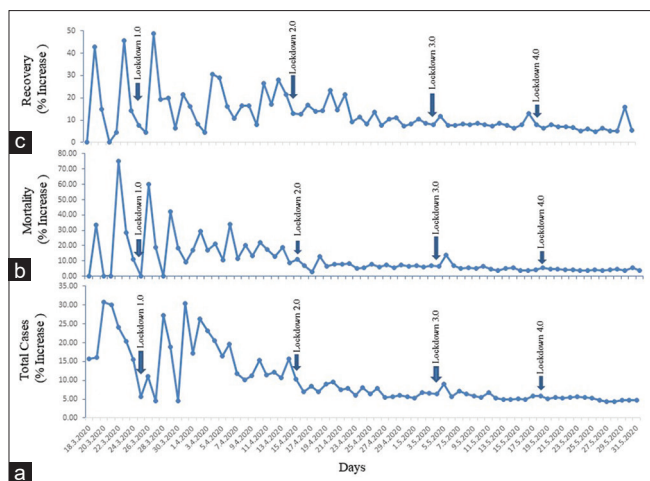


Figure 2: Impacts of lockdown on COVID-19 spread. The distribution of COVID-19 at different time points has been shown. (a) The percentage increase in COVID-19 cases. The increment in mortality and recovered cases has been shown in (b and c), respectively

In the second phase, the average increment in infected cases was 7.17% everyday, with a doubling period of 10.0 days (cases increased from 11933 to 40263) [Figure 2a]. The average increment in mortality was 7.15% per day (ranging from 2.86% to 12.96%). Total 9543 infected cases were recovered, with an average increment of 12.44% per day [Figure 2c].

In the subsequent phase, the average increment in infected cases was approximately 6% per day, with a doubling period of 12 days. Total 1483 patients died, with an average increment rate of 5.82% per day (ranging from 3.9% to 14.0%). Total 22,347 infected cases were recovered, with an average rate of 8.51% per day.

In the last phase, the average increment in infected cases was 5.09% per day, with a doubling period of 14.17 days. The increment in mortality cases was ranging from 3.63% to 5.63% (average increment: 4.28% per day). Total 50,160 infected patients were recovered, with an average rate of 6.95% per day [Figure 2].

Overall, the lockdown strategies seem successful in reducing the transmission of COVID-19 infection in India. The proportion of the young age population (65% below 35 years of age) along with the mitigation strategies had definitely made a negative impact on the transmission.

Financial support and sponsorship

The grant, No. 56/2/Hae/BMS to NB, received from Indian

Council for Medical Research (ICMR), New Delhi, is highly acknowledged.

Conflicts of interest

There are no conflicts of interest.

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REFERENCES

1. Zhu N, Zhang D, Wang W, Li X, Yang B, Song J, *et al.* A novel coronavirus from patients with pneumonia in China, 2019. *N Engl J Med* 2020; 382:727-33.
2. Asad A, Srivastava S, Verma MK. Evolution of COVID-19 pandemic in India. *Trans Indian Natl Acad Eng* 2020;1-8. [Doi: 10.1007/s41403-020-00166-y].
3. Lau H, Khosrawipour V, Kocbach P, Mikolajczyk A, Schubert J, Bania J, *et al.* The positive impact of lockdown in Wuhan on containing the COVID-19 outbreak in China. *J Travel Med* 2020;27:taaa037,[https://doi.org/10.1093/jtm/taaa037].
4. Flaxman, S, Mishra, S, Gandy A, Juliette, H, Mellan TA, Coupland H, *et al.* Estimating the effects of non-pharmaceutical interventions on COVID-19 in Europe. *Nature* 2020;584:257-61.
5. Pepe E, Bajardi P, Gauvin L, Privitera F, Lake B, Cattuto C, *et al.* COVID-19 outbreak response, a dataset to assess mobility changes in Italy following national lockdown. *Sci Data* 2020; 7:230.

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Access this article online	
Quick Response Code: 	Website: www.jgid.org
	DOI: 10.4103/jgid.jgid_340_20

How to cite this article: Bhardwaj N, Chandra H. Impacts of lockdown interventions on the spread of COVID-19 in India. *J Global Infect Dis* 2021;13:61-2.
Received: 25 September 2020 **Revised:** 12 October 2020
Accepted: 15 October 2020 **Published:** 29 January 2021
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