



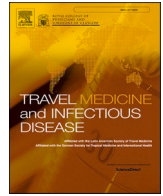
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Second wave of COVID-19 in India: Dissection of the causes and lessons learnt



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Dear Editor,

The second wave of coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) [1], has struck India severely, with a significant case fatality rate (Fig. 1). The present article highlights the plausible causes behind the second wave in India and lessons learnt from the current scenario to prevent the subsequent waves in the future. In India, 29.27 million cases have been reported so far during the pandemic, with a case fatality rate of 1.24% (363,079 deaths) up to June 11, 2021 [2]. During this ongoing second wave, India's healthcare system has been overburdened, causing a dearth of medical oxygen, hospital beds, and other essentialities for the COVID-19 patients.

Multiple factors may be involved in driving the second wave of COVID-19 in India, such as the complex interplay of mutant strains, violation of COVID appropriate behaviour, and government and public complacency on initiation of the vaccination drive. The emergence of new SARS-CoV-2 lineage B.1.617, a "variant of concern" in India, has been associated with a surge in daily infections [3]. The high transmissibility of the B.1.617 variant can be deduced from its rapid spread to multiple countries apart from being India's dominant strain. Till June 11, 2021, approximately 0.073% (21,365) of the positive samples (29,274,823) in India have been sequenced and uploaded to the Global Initiative on Sharing All Influenza Data (GISAID) database to identify the SARS-CoV-2 variants [4]. Thus, there is an urgent need to expand genome sequencing to better track, understand and control emerging and more transmissible SARS-COV-2 variants in various states of India [5]. Furthermore, the mutations and recombination which cause the emergence of novel lineages such as B.1.617, can reduce the sensitivity of certain diagnostic approaches such as RT-qPCR. Thus, effective primer designing is essential to improve the sensitivity and specificity of the detection process for the accurate mass screening of samples.

The pandemic fatigue and leniency in following the COVID-19 protocols were surfacing during the initial phase of the second wave. The vaccination drive was announced in India on January 16, 2021, the day on which the total active cases were just 15,144. As the COVID-19 seemed to be under control, the public became complacent on

contemplating the end of the pandemic and, the government relaxed its containment approach as well, allowing mass election rallies and social and religious gatherings such as Kumbh Mela (approximately 7 million people), where pilgrims turned into nationwide super-spreaders leading to the resurgence of the second wave. India is the largest democratic country globally; however, looking at the current COVID-19 situation, the state elections (Assam, Puducherry, Kerala, Tamil Nadu, and West Bengal) could have been postponed till normality. Despite being stuck in the unsteerable situation amid the grave COVID-19 second wave, incidences of the breach in COVID-19 protocols keep on resurfacing, such as the mass gathering of around ten thousand people at the funeral procession of an Islamic leader in the state of Uttar Pradesh on May 10, 2021. It is clear that people lowered the guard and did not follow the guidelines and protocols after the first wave of COVID-19. To prevent the further spread of this havoc in India, the Government of India and its citizens need to take the responsibility to overcome the ongoing pandemic wave by following Standard Operating Procedures (SOP), which would also help to mitigate subsequent waves of COVID-19. The union government needs to replicate and implement the success stories of a few states in India, such as Mizoram, which implemented time to time SOP to control this pandemic and consistently maintained a higher recovery rate with a low fatality rate (0.41%) [2].

Besides the compliance of mitigation measures, there is an urgent need to expand the available vaccine supply by the implementation of public health policies such as single-dose vaccination of individuals with a history of SARS-CoV-2 infection, so that more naive individuals may be immunized by double dose, until the vaccine supply limitations are eased and booster protocols are revamped. In conclusion, the Government of India needs to take immediate and stringent action to control the ongoing second wave of the pandemic with strict protocols and boost COVID-19 immunization speed so that the projection of 1.19 million deaths by October 1, 2021 [as per the Institute for Health Metrics and Evaluation (IHME)] may be averted [6].

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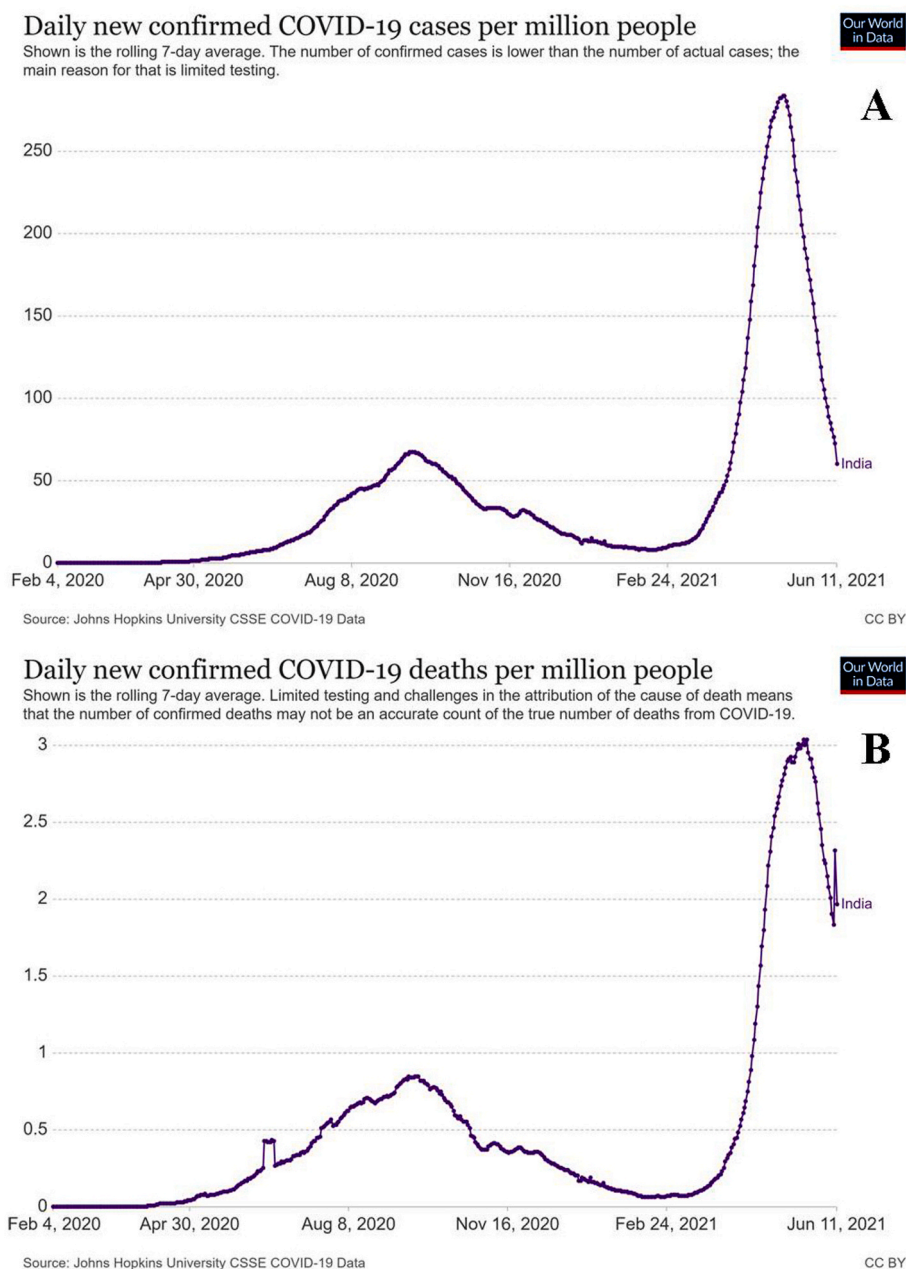


Fig. 1. Confirmed COVID-19 cases (A) and deaths (B) in the first and second waves of COVID-19 in India. Reproduced from Our World in Data (<https://ourworldindata.org/coronavirus/country/india>) under CC BY license.

CRediT author contribution statement

Om Prakash Choudhary: Conceptualization, Data Curation, Visualization, Writing - Original Draft, Writing - review & editing. Priyanka: Conceptualization, Supervision, Writing - Original Draft, Writing - review & editing. Indraj Singh: Supervision, Writing - Original Draft, Writing - review & editing. Alfonso J. Rodriguez-Morales: Writing - review & editing. All authors critically reviewed and approved the final version of the manuscript.

Ethical approval

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Declaration of competing interest

All authors report no conflicts of interest relevant to this article.

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