Review Article

Stories from the East: COVID-19 Situation in India

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Abstract: The war against COVID-19 is still ongoing since the first report in December 2019. On 1st May 2021, India has reported over 400,000 new COVID-19 cases within 24 hours. The situation in the country continued to progress, which was associated with the reporting of the variant-of-concern and the variant-of-interest, including the B1.617 viruses. The government has taken public health measures, including campaigns to increase awareness about mask-wearing and physical distancing as well as lockdown plans to prevent further spread of the disease in the densely populated country. Furthermore, the countrywide vaccination program has begun in early 2021, while the government of India continues to monitor the COVID-19 situation in the country. The current review aims to provide a brief situation report in India before discussing management strategies taken and different phases of the vaccination program.

Keywords: SARS-CoV-2; COVID-19; situation; India; variants

1. Introduction

Since the ongoing COVID-19 pandemic, which was first reported in China around December 2019, there have been 172,630,637 confirmed cases and 3,718,683 deaths worldwide on the 7th June 2021[1–7]. This has taken a significant toll both socially and economically throughout the world. Currently, India is a densely populated country severely affected by COVID-19 and experiencing one of the worst crises [8–10]. On 1st May 2021, there were over 400,000 new COVID-19 cases for the first time within 24 hours in India. Based on data retrieved from the Ministry of Health and Family Welfare (MoHFW) on the 15th May 2021, there was a total of 3,673,802 active cases, with 20,432,898 discharged and 266,207 deaths in total[11]. While many countries (including Australia, United Kingdom, Italy) have suspended traveling to and from India, the government of India has taken the approach to strictly enforce the Test-Track-Treat protocol throughout the country, emphasizing the public to adhere to COVID-appropriate behavior and to boost the vaccination drive[12,13]. Several steps are taken using the Test-Track-Treat protocol, such as increasing the number of testing using real time-PCR (RT-PCR) to more than 70%, quarantine new positive cases as

soon as possible, and tracing their contacts sooner. The containment zones are demarcated meticulously updated on the network page by each District Collectors and by the States, and this information is regularly shared with the MoHFW[14]. These measurements ensure close monitoring for any influenza-like illness (ILI) or severe acute respiratory infections (SARI) cases, house-to-house surveillance, and strict perimeter control. In addition, COVID appropriate behavior such as wearing a face mask, physical distancing, and hand hygiene have been strictly enforced; failure to comply with the law will result in imposition of fines and administrative actions.

2. Important Events Since the First COVID-19 Case Reported in 2020

The first confirmed case on the 30th January 2020 was a patient who returned from Wuhan to Kerala[15,16]. Until 3rd February 2020, only three confirmed cases were reported in Kerala who were all stable and isolated in the hospital. The government of India ensured those who have returned from China since 15th January 2020 undergo a mandatory quarantine for 14 days and issued travel advisories requesting the public to refrain from traveling to the specified country. At the same time, the Ministry of Tourism has also taken initiatives to coordinate with the Hotels Association in India to encourage the public to report themselves if they have visited any tourists of religious areas. The World Health Organization (WHO) declared the COVID-19 outbreak as a pandemic on 11th March 2020, and the Government of India announced this as a notified disaster under the Disaster Management Act 2005[17]. Travelers from China, Iran, Italy, France, Germany, Spain and the Republic of Korea after 15th February 2020 were mandated to quarantine for at least 14 days. There were 84 cases of Covid-19 reported in India, and two deaths were reported on the 14th March 2020. Cases were from 13 states in India, mainly originating in Kerala (19 cases) followed by Maharashtra (14 cases), Haryana (14 cases), Uttar Pradesh (12 cases), Delhi (7 cases), Karnataka (6 cases), Ladakh (3 cases), Rajasthan (3 cases), Jammu & Kashmir (2 cases), Andhra Pradesh (1 case), Punjab (1 case), Telangana (1 case) and Tamil Nadu (1 case). A 76 years old male from Karnataka and 68 years old female from Delhi with underlying comorbidities passed away. Due to the rise in cases, "Janata curfew" for 14 hours from 7.00 a.m. to 9.00 p.m. was announced by the Prime Minister of India, Narendra Modi on 22nd March 2020, pleading to the public to stay at home and to observe social distancing[18]. MoHFW had also taken precautionary steps to ensure sufficient isolation wards, personal protective equipment (PPEs), medicines, testing kits and workers. As thousands of cases continue to spike per day, the Prime Minister of India issued a lockdown throughout the country starting on the 25th March 2020. However, the lockdown was further extended thrice till 31st May 2020[19–21]. International flights were suspended from 25th March till 14th April 2020, and any interstate travel was restricted[22]. During the lockdown period, the government of India has taken the opportunity to make advancements in the healthcare system and infrastructures. There were 930 dedicated COVID hospitals with 158,747 isolation beds, 20,355 ICU beds, 69,076 oxygen supported beds, and 2,362 dedicated COVID Health Centres with 132,593 isolation beds; 10,903 ICU beds and 45,562 oxygen supported beds operationalized as reported by MoFHW on 27th May 2020[23,24].

Furthermore, during the Global Vaccine Summit 2020, the Prime Minister of India emphasized the ability of India to produce quality vaccines and medicines with minimal costs, and 15 million USD was pledged to the Vaccine Alliance, GAVI[25]. The Indian Council of Medical Research and State authorities also ensured that no individual was restricted from being tested. Although RT-PCR is the gold standard to diagnose COVID-19, the government of India has decided to increase more Rapid Antigen tests because it is safe, simple, and provides quicker results. There were also 788 in the government sector and 317 private labs, making it up to a total of 1,105 labs[26]. Along with this, the Government of India launched the "Aarogya Setu" mobile application that uses Bluetooth technology to aid in surveillance and contact tracing[27]. The application is available in 11 languages and can be installed into smartphones, allowing users to determine the risk of catching infection based on their interaction with others[28]. Besides that, a video consultation program called e-ICU was started by New Delhi-based All India Institute of Medical Sciences (AIIMS) across the country on the 8th July to allow front liners to share their experiences in treating COVID-19 patients and have discussions with other experts in this field using this platform[29].

Ministry of Home Affairs issued guidelines on the 30th September on re-opening some states, but the lockdown continued in containment zones until the 30th November 2020[30]. On the 8th October 2020, 'Jan Andolan' was launched to closely observe these three appropriate behaviors: social distancing of six feet, wearing a mask and washing hands often[31]. In November 2020, daily new cases of COVID-19 and the number of deaths per million started to decline and was much lesser compared to some parts of the world. Ever since mid-September 2020, the lowest case number of 9,110 was reported on 9th February 2021. However, a surge of cases returned in some states with 14,264 cases on the 21st February 2021 and continues to spike within two weeks with an almost 43% increase of COVID-19 cases and 37% new deaths on a weekly basis. The national capital of India, New Delhi was heavily affected during the second wave and has been under lockdown since the 19th April 2021[32]. Based on the situation report of 28th April 2021, India has the highest daily cases[33]. At that point in time, India was ranked fourth highest in terms of the number of deaths with a case fatality ratio of 1.12% in the world. The leading state with more than four million cases is Maharashtra followed by a million over cases in Kerala, Karnataka, Uttar Pradesh, and Tamil Nadu[34]. On 1st May 2021, India has become the first country to record over 400,000 new COVID-19 cases within 24 hours since the pandemic. There were 401,993 new infections with a total of 19.1 million cases and 3,523 deaths, adding up the total number of deaths to 211,853[35,36]. Two weeks later, these figures continue to rise, resulting in a total of 3,673,802 active cases, with 20,432,898 discharged and 266,207 deaths[11]. As of 1st June 2021, the data retrieved from WHO Coronavirus (COVID-19) Dashboard (https://covid19.who.int/) recorded a total of 28,208,619 confirmed cases and 331,899 total deaths in India.
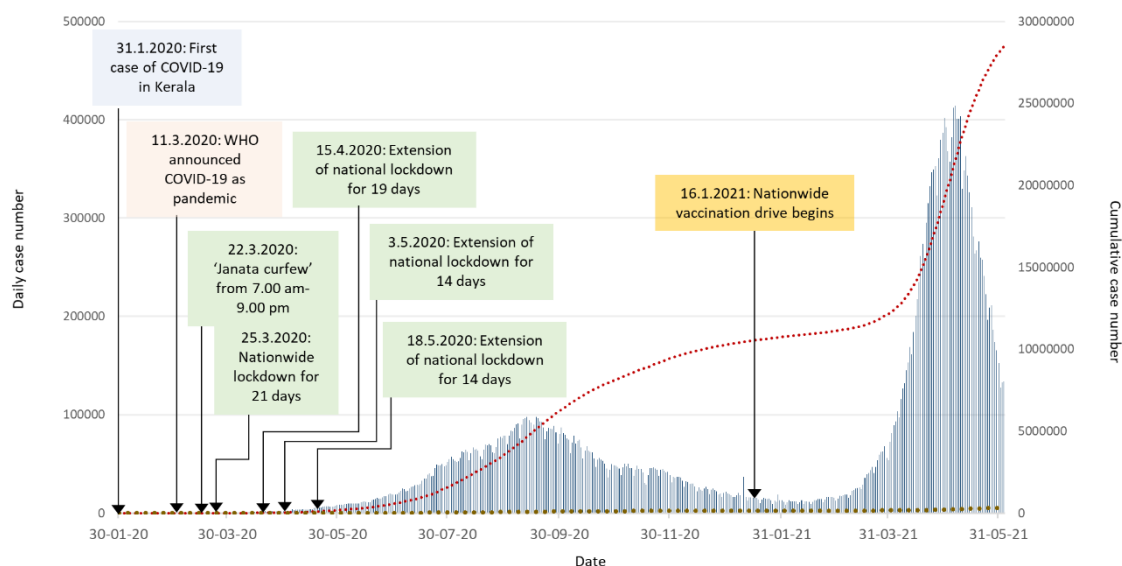
Figure 1. Illustration of daily confirmed COVID-19 cases, cumulative COVID-19 cases, cumulative deaths due to COVID-19, and a brief timeline of the events in India since the first case reported in the country.

3. Combating COVID-19: Medications and Vaccination Program in India

Along with Directorate General of Health Services, MoHFW, and Indian Council of Medical Research's ICMR-COVID-19 National task force, AIIMS has recently published an updated comprehensive guideline for the management of COVID-19 adult patients, removing recommendations on hydroxychloroquine and convalescent plasma use[37–39]. Based on the guidelines, the use of medications like remdesivir (under Emergency Use Authorisation) and tocillizumab (off-label use) should be considered carefully and not to be used in mild COVID-19 patients. Additionally, the exportation of remdesivir injection has been prohibited since the 11th April 2021. Remdesivir manufacturers also had to ramp up their production to 7,400,000 of vials every month. Twenty more manufacturing sites have been approved to meet the demands of hospitalized patients on oxygen support in 19 states[40]. As for the case of steroids, the guideline emphasized that they should be used at "right time, right dose and for the right duration", only in hospitalized moderately severe and critically ill COVID-19 patients.

On the 9th January 2021, the Prime Minister of India has shared on his social media account and issued a press release that 16th January represents a "landmark step" for the country in the fight of COVID-19, as the national-wide vaccination drive begins, intending to vaccinate 300 million people by July 2021[41]. Phase I of the National Covid-19 Vaccination Strategy targeted healthcare and frontline workers with more than 60% vaccinated within a month[42]. The registrations and booking for vaccination appointment for phase 2 using the COWIN portal or via the "Aarogya Setu" mobile application started on 1st March 2021, for those 60 years old and above as well as those aged between 45–59 with comorbidities that accounted for more than 80% of mortality in the country. Subsequently, the government announced the "Liberalised and Accelerated Phase 3 Strategy of Covid-19 Vaccination" to include individuals above 18 years old with registration opening from 28th April 2021 and

vaccination begun from the 1st May 2021[43]. Vaccination is provided free of charge at the Government Vaccination Centres[43–49]. At the time of writing, the National Regulator (Drugs Controller General of India) has granted Emergency Use Authorisation (EUA) of the COVISHIELD® (AstraZeneca's vaccine), manufactured by Serum Institute of India (SII) with an efficacy of 62–90%, and COVAXIN manufactured by ICMR in collaboration with Bharat Biotech International Limited (BBIL). COVAXIN phase 1 and 2 clinical trials conducted around July till October 2020 on 755 participants showed promising results and safety profiles. The largest clinical trial conducted on 25,800 participants also showed 81% efficacy against the SARS-CoV-2 virus in early March. The Drugs Controller of India (DCGI) has already approved COVAXIN for the Restricted Use in Emergency Situation. Russia's Sputnik V, the third vaccine, was approved in India in mid-April. Within merely 26 days, India becomes the fastest country to reach a milestone of vaccinating 7,000,000 citizens[50]. On top of that, the Union Minister for Health and Family Welfare, Dr. Harsh Vardhan has also reassured the safety of both the vaccines and efficacy against current strains, stating that the percentage of severe Adverse Events Following Immunisation is 0.0002% of the total number of beneficiaries vaccinated[51]. As of 1st May 2021, 156,816,031 vaccines have been administered, and 28,644,878 have already received their second dose[52].

4. Emergence of Variant-of-concern (VOC) and Variant-of-interest (VOI): B.1.617 Viruses

The genomic changes SARS-CoV-2 through whole-genome sequencing (WGS) is continuously being monitored by the Indian SARS-CoV-2 Genomics Consortium (INSACOG) since December 2020. Out of 13,614 WGS samples processed in a network of 10 laboratories, 1,189 samples tested positive for variants of concern which are 1,109 UK variants; 79 variants which were firstly described in South Africa, and 1 of them was the variant firstly described in Brazil as of 15th April 2021[53]. For the past few weeks, the steep rise of cases across India has spread to about 40 nations, including Singapore, United Kingdom, and Fiji was associated with the B.1.617 variant[54,55]. The B.1.617 viruses are categories into three lineages: B.1.617.1, B.1.617.2 and B.1.617.3[56]. On the 1st June 2021, the WHO released a public statement to facilitate communication regarding the naming of VOC and VOI to avoid country (or area) stigma[57]. In the same report, they have revised the status of VOC and VOI, labeling B.1.617.2 or variant Delta as VOC and B.1.617.1 as variant Kappa as VOI. B.1.617.3 is no longer listed as VOC or VOI due to few reports of the variants as pointed out by the WHO. While some studies are investigating the spread of different SARS-CoV-2 variants around the world, there are ongoing discussion revolving the efficacy of vaccines[58–64]. Several teams believed that the double mutation results in a more virulent variant. Till then, more studies are necessary to fully understand how these genomic changes contribute to the virulence and "behaviour" of these variants, particularly whether these changes would affect the efficacy of vaccines[65–68].

5. Conclusions

The constant updates on COVID-19 situations from official authorities have allowed citizens to access the latest information quickly. The statistics on vaccination in India

continue to rise, enabling the community to achieve immunity against COVID-19 in due time. The next hurdle for universal control of the pandemic would involve successful immunization programs globally[69]. Some countries are struck with vaccine shortages as well as economic and logistic issues[32,69–72]. For India, several organizations and governments have started delivering critical lifesaving supplies and medicines to support the country's healthcare system[73–75]. The war against COVID-19 is not over yet and has taught the world not to take this pandemic lightly. Previous collaborative efforts between countries have yielded success in developing vaccines following the availability of genome sequences of SARS-CoV-2 viruses. Moving forward, everyone needs to join hands to break the transmission chain and curb the spread of this notorious coronavirus.

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