



## Covid-19 in India: Problems, Difficulties, and Insights

Dr. Bharat Pratap Singh

*Post Doctoral Fellow*

*Indian Council of Social Science Research (I.C.S.S.R.)*

### ABSTRACT

COVID-19 has impacted every area of the world, and India is among the countries most severely afflicted by the pandemic. The number of COVID-19 cases in India is increasing consistently daily. As of August 10th, 2020, India has recorded more than 2.3 million confirmed COVID-19 cases, with the second million occurring exactly three weeks after the country reached one million infections on July 16th. Out of the new cases, 42 percent have been reported in Andhra Pradesh, Karnataka, Uttar Pradesh, West Bengal, and Bihar. Additionally, there have been 46,188 reported deaths. The states of India that have been most severely impacted include Maharashtra, Tamil Nadu, Andhra Pradesh, Karnataka, Delhi, and Uttar Pradesh. Another growing worry is the emergence of interior regions as new epicentres. Positive instances are being progressively reported in four states in eastern India, including Odisha, Bihar, Assam, and West Bengal. There are two primary factors contributing to the increase in cases in rural regions. Firstly, the influx of migrants from big cities who were not screened or showed no symptoms. Secondly, the inadequate healthcare infrastructure in rural settings. Among the 739 districts in India, 13 districts, spanning over 8 states and a union territory, contribute to one-seventh of all Covid-19 fatalities. The 13 districts are Kamrup Metro in Assam, Patna in Bihar, Ranchi in Jharkhand, Alappuzha and Thiruvananthapuram in Kerala, Ganjam in Odisha, Lucknow in Uttar Pradesh, North 24 Paraganas, Hooghly, Howrah, Kolkata, and Maldah in West Bengal, and Delhi. These districts represent around 9% of India's current COVID-19 cases and around 14% of the total COVID-19 deaths in the country. During the spring and summer, the COVID-19 situation in India has significantly worsened and has the potential to further deteriorate based on the present trajectory, with over 60,000 cases being reported daily and around 900 fatalities occurring each day.

The COVID-19 pandemic has had a significant influence on several sectors, such as tourism, hospitality, and education, leading to lockdowns and travel restrictions. In response to the coronavirus crisis, the national government has

implemented many measures such as the monetary relief package under the Pradhan Mantri Garib Kalyan Yojana, the Uttar Pradesh Rojgar Abhiyaan, and the Atma Nirbhar Abhiyaan. In addition, state administrations have implemented other projects like as Operation SHIELD, 5T Plan, Mission Fateh, and Snehar Paras. We provide a concise description of them. Several locations in India, such as the state of Kerala, the district of Bhilwara in Rajasthan, and the slums of Dharavi in Mumbai, have effectively controlled the spread of COVID-19.

To ensure the success of a containment and recovery plan, it is crucial to continue implementing public health measures to suppress the epidemic, namely by maintaining a R value below 1. In addition to tracking the infection rate, it is crucial to closely monitor the positive rate and the case fatality ratio (death rate) rather than relying heavily on the recovery rate, which appears to be the present focus. As the pandemic diminishes, it is quite probable that almost 97% or more of the patients would recover, resulting in a mortality rate of around 2 or 3%. India requires the development and implementation of an epidemic control plan to effectively manage and restrict the transmission of the infection inside the country, which is currently lacking. Amidst the COVID-19 pandemic, as many nations grapple with the intertwined challenges of public health and economic decline, India is confronted with an extra formidable issue - a significant dilemma involving migrant labour. Although the long-term effects of this home movement are uncertain, some patterns have emerged. In May, we provided the government with many suggestions and highlighted some lessons that India may learn from other countries. There is an unavoidable and extended economic downturn in the horizon.

**Keywords: COVID-19, India**

### I. INTRODUCTION

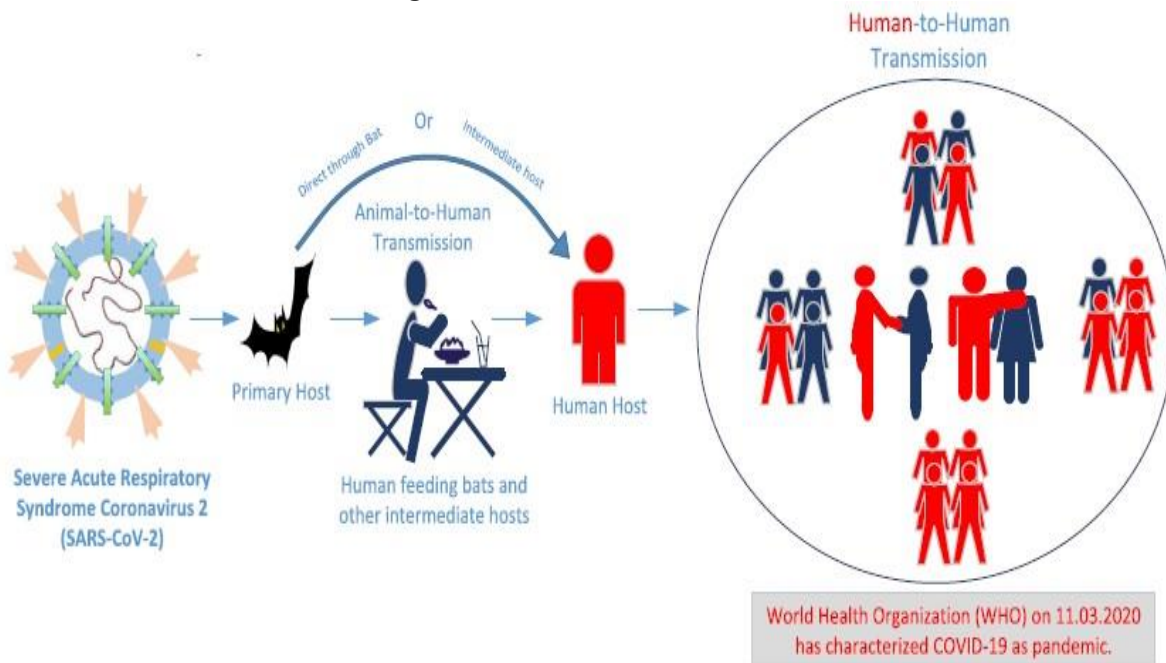
The COVID-19 pandemic, which began in Wuhan, Hubei Province, People's Republic of China (PRC), has now become a global phenomenon, affecting all regions of the world. COVID-19 is a result of infection by a specific



kind of  $\beta$ -coronavirus known as severe acute respiratory syndrome coronavirus (SARS-CoV-2). The illness is extremely infectious and may infect a wide range of hosts (Tomar and Gupta 2020). Figure 1 depicts the mechanism of Covid-19 transfer. The proliferation of international travel and the process of globalisation expedited its transmission across nations. On March 11, 2020, the World Health Organisation (WHO) classified COVID-19 as a pandemic due to the increasing number of cases, which reached 118,000 in over 110 countries worldwide. The COVID-19

pandemic has resulted in significant loss of human life and economic means of support. According to the United Nations, this is the most severe global catastrophe since World War II. As of August 10, 2020, the global COVID-19 pandemic has affected more than 22 million individuals and resulted in the deaths of over 742,000 people. The nations most severely impacted are the USA, Brazil, India, Russia, and the UK (see to figure 2) (World Health Organisation 2020b). India is third globally in terms of confirmed COVID-19 cases, behind the United States and Brazil.

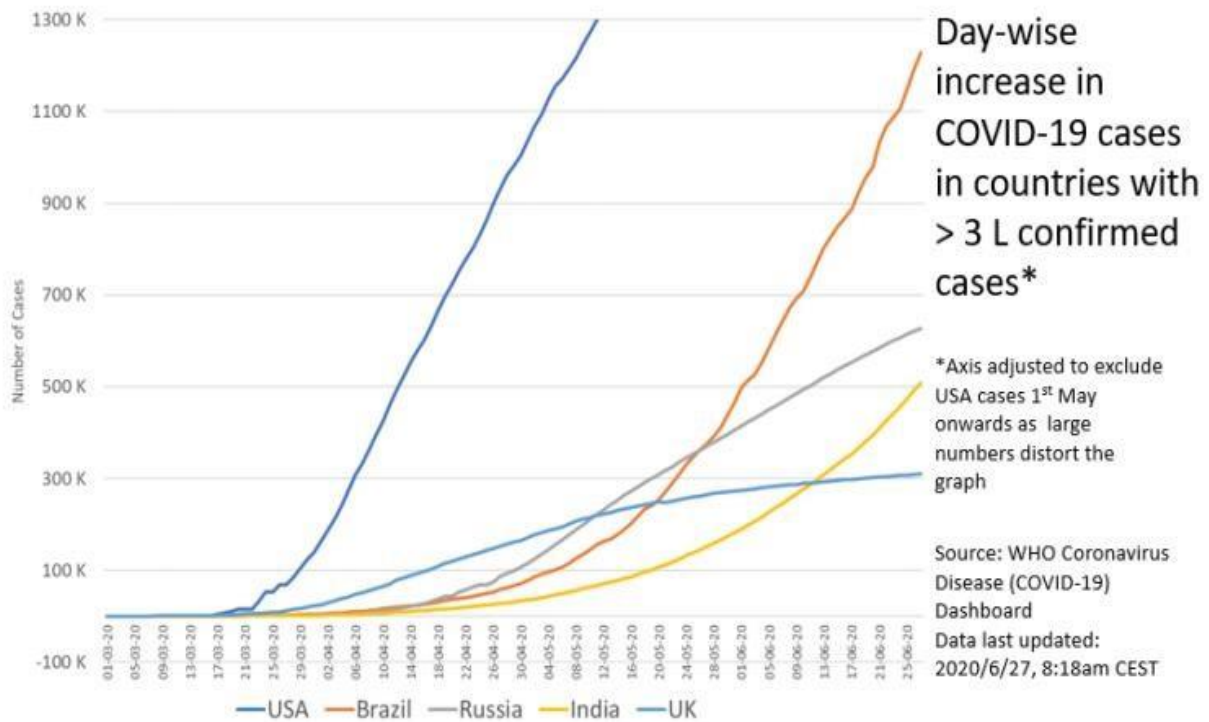
Figure 1: Transmission of COVID-19



Source: Tomar, Anuradha, and Neeraj Gupta. 2020. "Prediction for the Spread of COVID-19 in India and Effectiveness of Preventive Measures." *Science of The Total Environment* 728 (August): 138762. <https://doi.org/10.1016/j.scitotenv.2020.138762>.



Figure 2: Day-wise increase in COVID-19 cases in countries with >300,000 confirmed cases



Source: World Health Organization. 2020. "Novel Coronavirus Disease (COVID-19)." Situation Update Report 22. World Health Organization. [https://www.who.int/docs/defaultsource/wrindia/situation-report/india-situation-report-22.pdf?sfvrsn=c49bf98d\\_2](https://www.who.int/docs/defaultsource/wrindia/situation-report/india-situation-report-22.pdf?sfvrsn=c49bf98d_2).

The initial instance of COVID-19 in India was documented on January 30th, 2020. On July 17, 2020, India had a total of 1,003,832 confirmed cases of COVID-19. Out of these cases, 373,379 were still active, 677,422 had been healed or discharged, 1 person had moved, and there were 26,816 recorded fatalities. The COVID-19 epidemic in India is depicted in Figure 3

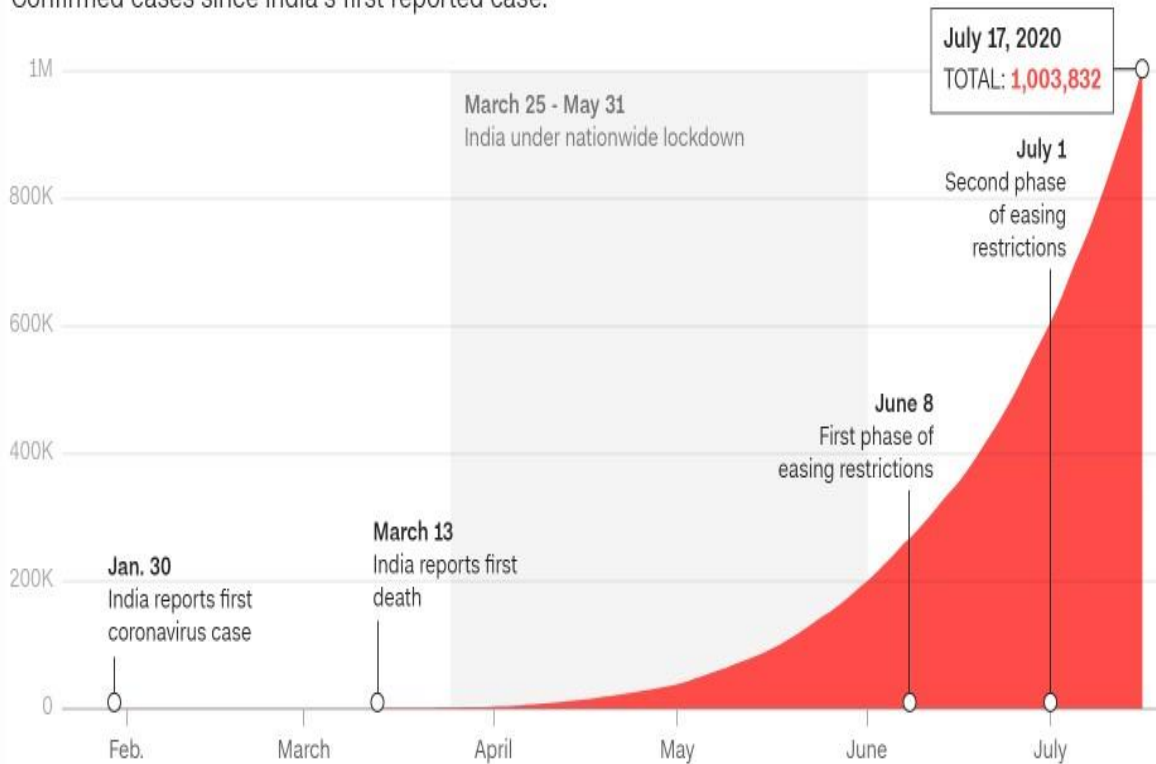
(Hollingsworth et al., 2020). India has a comparatively low mortality rate of 2.83%, which is lower than the global fatality rate of 6.19%. India has the greatest number of confirmed COVID-19 cases in Asia.



Figure 3: How COVID-19 outbreak unfolded in India

## How India's coronavirus outbreak unfolded

Confirmed cases since India's first reported case.

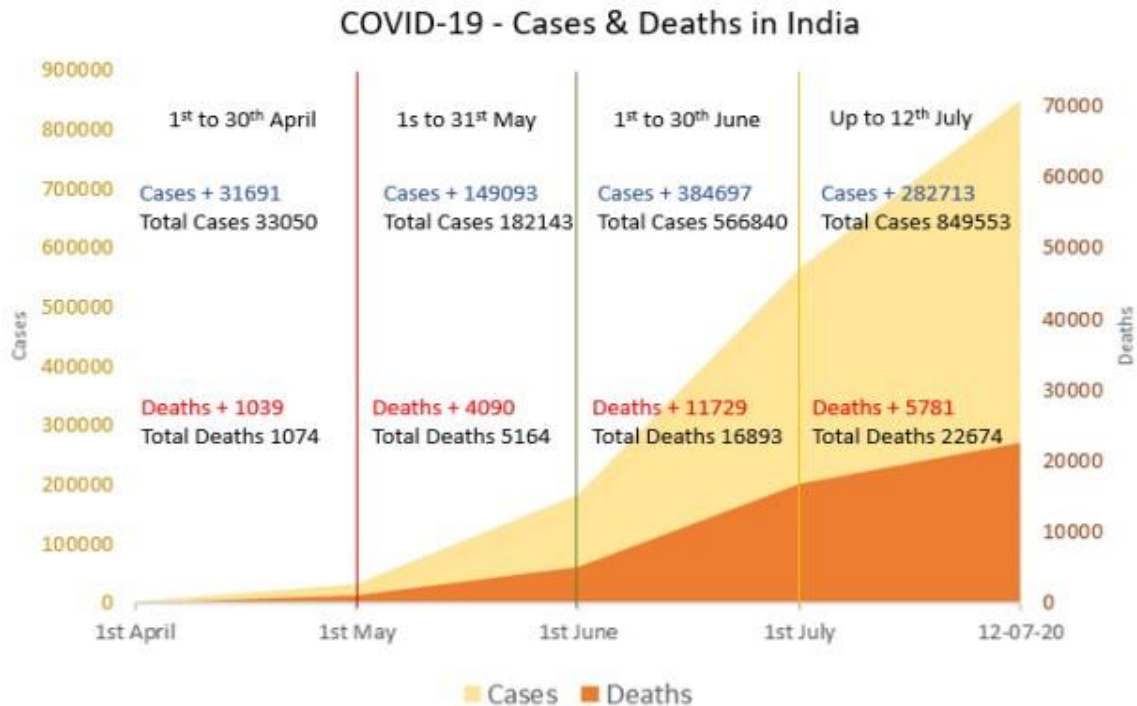


CNN Source: Johns Hopkins University Center for Systems Science and Engineering. Data as of July 17, 2020  
Graphic: Natalie Leung and Jason Kwok, CNN

Source: Hollingsworth, Julia, Jason Kwok, Natalie Leung, and Swati Gupta. 2020. "India Now Has More than 1 Million Coronavirus Cases. What Does That Mean -- and How Did the Country Get Here?" July 2020. <https://edition.cnn.com/2020/07/18/asia/indiacoronavirus-one-million-data-intl-hnk/index.html>



Figure 4: COVID-19 cases and deaths in India



Source: MoHFW Government of India COVID-19 Last updated on: 12/07/2020, 8 AM

Source: World Health Organization. 2020. "Novel Coronavirus Disease (COVID-19)." Situation Update Report 24. [https://www.who.int/docs/default-source/wrindia/situation-report/indiasituation-report-24.pdf?sfvrsn=dd1c8402\\_2](https://www.who.int/docs/default-source/wrindia/situation-report/indiasituation-report-24.pdf?sfvrsn=dd1c8402_2).

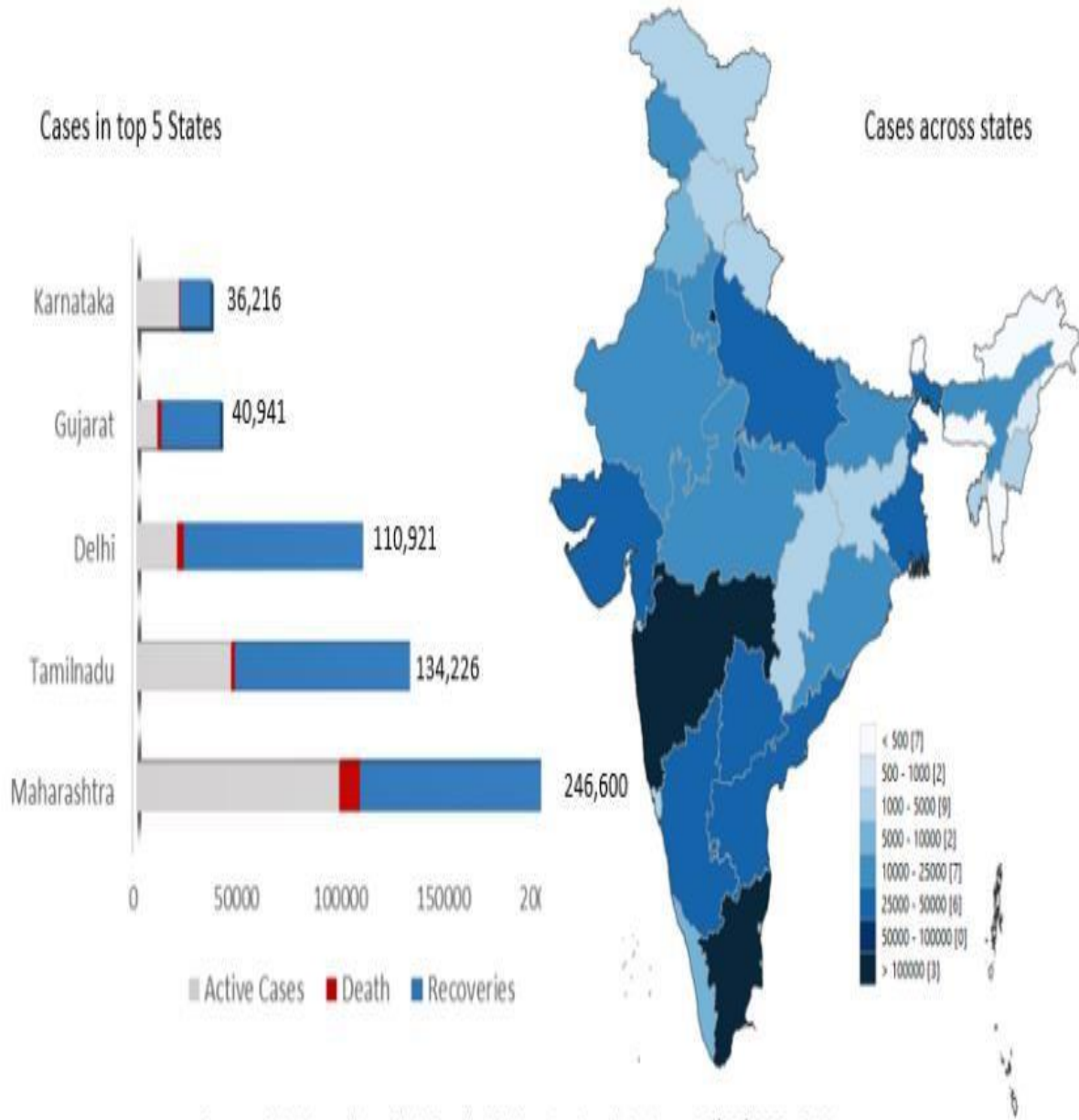
India's most severely affected states include Maharashtra, Delhi, Tamil Nadu, Gujarat, and Karnataka. Figure 5 illustrates the distribution of COVID-19 cases among different states in India, while Figure 6 displays the number of tests conducted per million people and the rate of positive test results for each state. According to the World Health Organisation (2020c), Jammu & Kashmir, Delhi, and Andhra Pradesh have conducted the most number of tests per million people. However, states like Maharashtra, Delhi,

and Telangana have a high test positive rate. Over time, the recovery rate appears to be increasing in states such as Delhi and West Bengal, as shown in Figure 7 (World Health Organisation, 2020d). The number of new daily cases in Delhi has decreased from a peak of around 3900 to 1500. Although the current levels are still elevated, the implementation of the home care approach together with an increase in testing appears to be yielding positive results.





Figure 5: COVID-19 cases across states in India

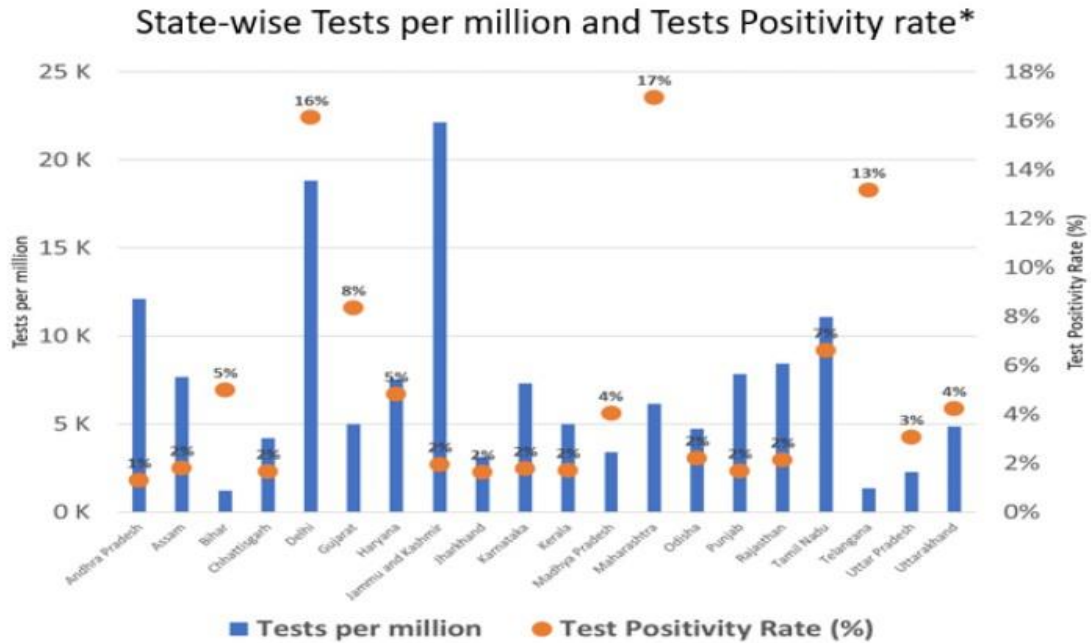


Source: Ministry of Health & Family Welfare Last updated on : 12/07/2020, 8 AM

Source: World Health Organization. 2020. "Novel Coronavirus Disease (COVID-19)." Situation Update Report 24. [https://www.who.int/docs/default-source/wrindia/situationreport/india-situation-report-24.pdf?sfvrsn=dd1c8402\\_2](https://www.who.int/docs/default-source/wrindia/situationreport/india-situation-report-24.pdf?sfvrsn=dd1c8402_2).



Figure 6: State-wise tests per million and tests positivity rate

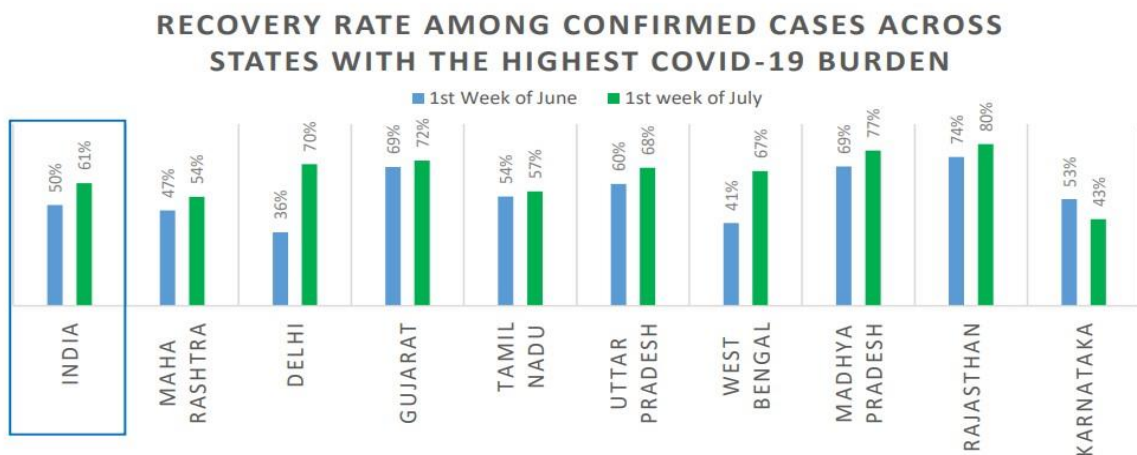


\*Only states with population of > 10 million are shown

Source: ICMR & State's bulletins Data last updated: 2020/6/21, 8 AM

Source: World Health Organization. 2020. "Novel Coronavirus Disease (COVID-19)." Situation Update Report 23. [https://www.who.int/docs/default-source/wrindia/situationreport/india-situation-report-23.pdf?sfvrsn=b09ca466\\_2](https://www.who.int/docs/default-source/wrindia/situationreport/india-situation-report-23.pdf?sfvrsn=b09ca466_2).

Figure 7: Recovery rate among confirmed cases across states with the highest COVID-19 burden



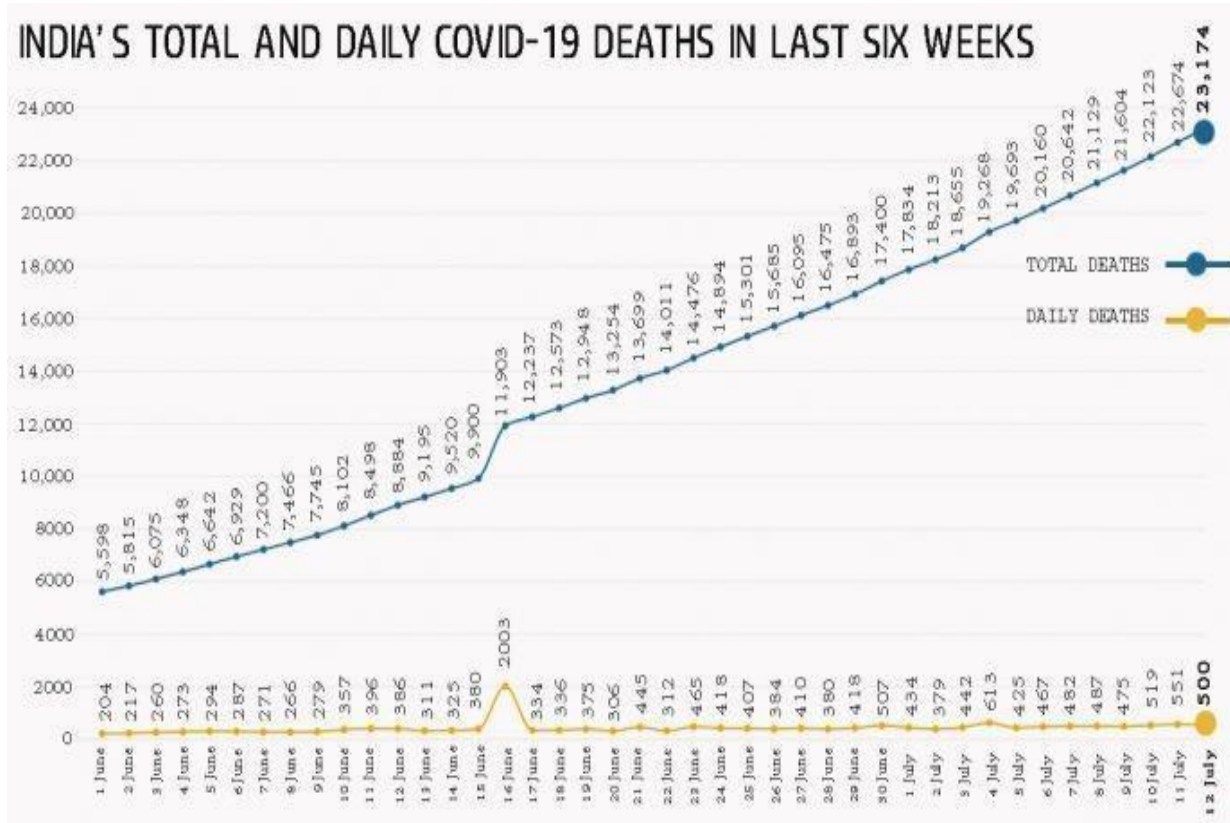
Source: MoHFW Government of India COVID-19 as on: 05 July 2020, 08:00 IST (GMT+5:30)

Source: World Health Organization. 2020. "Novel Coronavirus Disease (COVID-19)." Situation Update Report 23. [https://www.who.int/docs/default-source/wrindia/situationreport/india-situation-report-23.pdf?sfvrsn=b09ca466\\_2](https://www.who.int/docs/default-source/wrindia/situationreport/india-situation-report-23.pdf?sfvrsn=b09ca466_2).

From early June to mid-July, the number of daily COVID-19 fatalities did not show a significant increase, except for a sudden rise on June 16, 2020 (refer to Figure 8) (A. Ghosh 2020). Figure 9 illustrates the mortality rate of COVID-19 in different states of India, as presented by A. Ghosh and Kapoor in 2020.



Figure 8: Total and daily COVID-19 deaths in India



Source: Ghosh, Abantika. 2020. "India's Daily Covid Deaths Have More than Doubled in 6 Weeks, Positivity Rate Too on the Rise." July 2020. <https://theprint.in/health/indiadaily-covid-deaths-have-more-than-doubled-in-6-weeks-positivity-rate-too-on-the-rise/459920/>.

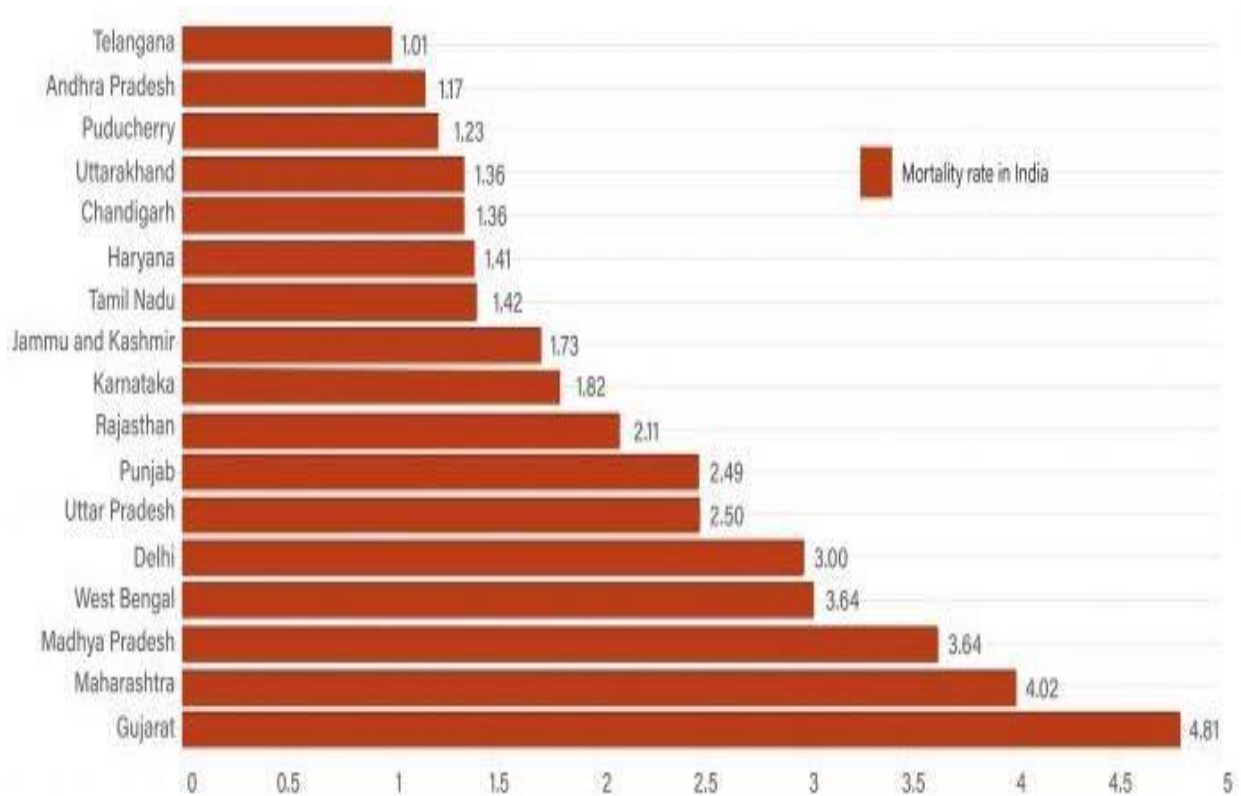
Up until mid-July, the COVID-19 mortality toll in India was comparatively lower than that of other nations facing similar illness loads. The early and strict nationwide lockdown implemented in India from March 24, 2020 for a duration of 21 days was widely believed to be effective. This measure provided the authorities with valuable time to organise the required personal protective equipment (PPE), masks, ventilators, isolation centres, hospital beds, and enhance the testing infrastructure to effectively

manage the situation. Some individuals believed that India's youthful people had a crucial role to fulfil, since they possessed robust immunity that could effectively resist the virus. With the increasing incidence of COVID-19 cases surpassing the rate of deaths, conducting a greater number of tests will contribute to a further decrease in the COVID-19 mortality rate in India.





Figure 9: State-wise COVID-19 mortality rate in India



\*Data from Maharashtra government report

Only states with mortality rate of 1% and above are depicted.

Source: Ghosh, Abantika, and Shipra Kapoor. 2020. "204 Deaths on 1 June to 553 on 13 July, India's Mortality Rate 2.6% Now — Latest Covid Numbers." July 2020.

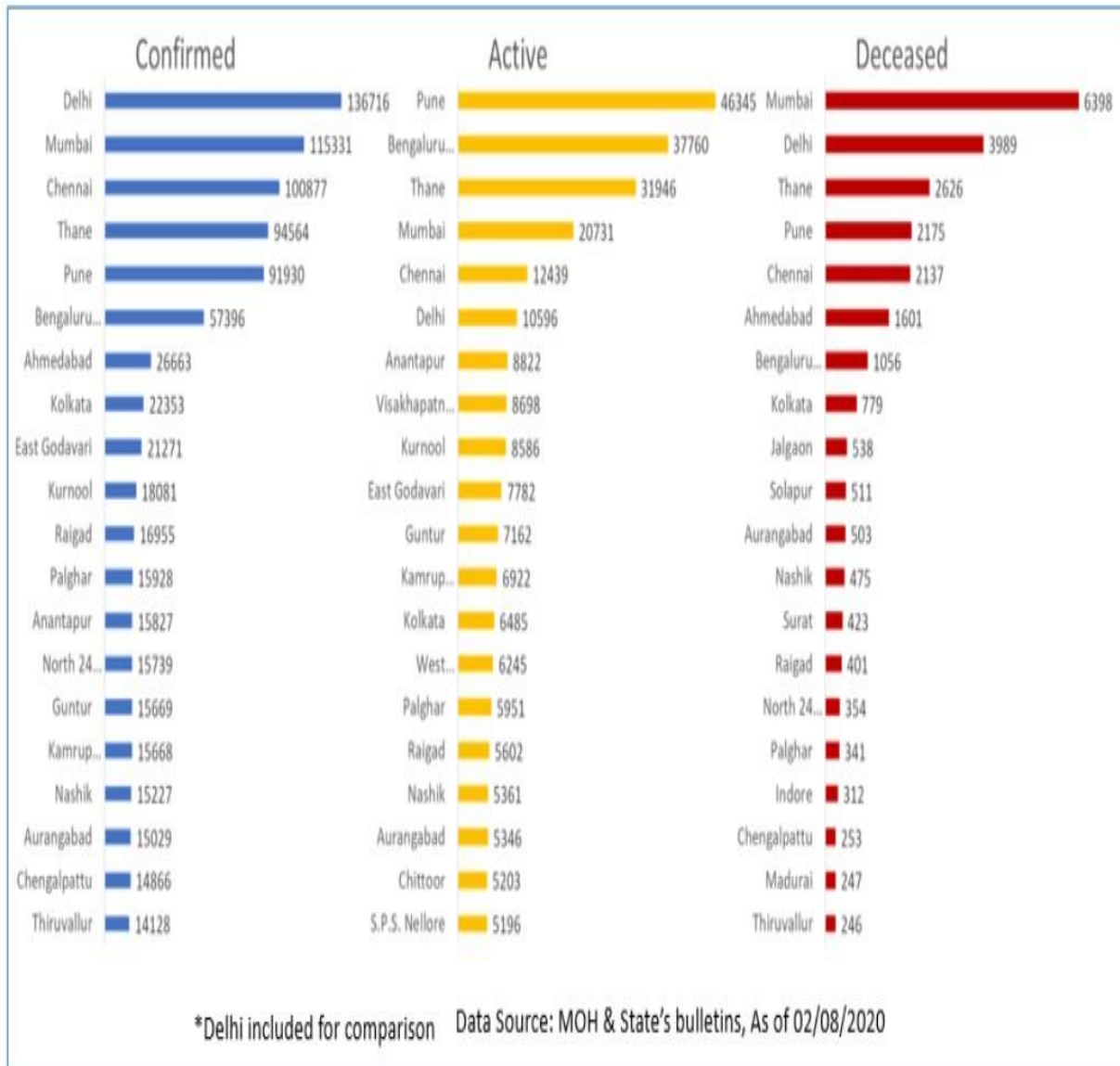
<https://theprint.in/india/daily-covid-tracker-latest-india-coronavirus-numbers-14-july/460672/>.

According to The New York Times 2020, as of August 6th, 2020, India has recorded a minimum of 1,964,500 verified cases of COVID-19 and 40,699 documented deaths. According to The New York Times (2020), Maharashtra has recorded the greatest fatality count to date. Figure 10 displays the number of confirmed cases, active cases, and died patients in the top 20 cities or

districts in India as of August 2, 2020, according to the World Health Organisation (2020a). While the COVID-19 growth rate has been decreasing gradually, the number of fatalities has been increasing progressively as well (refer to figure 11).



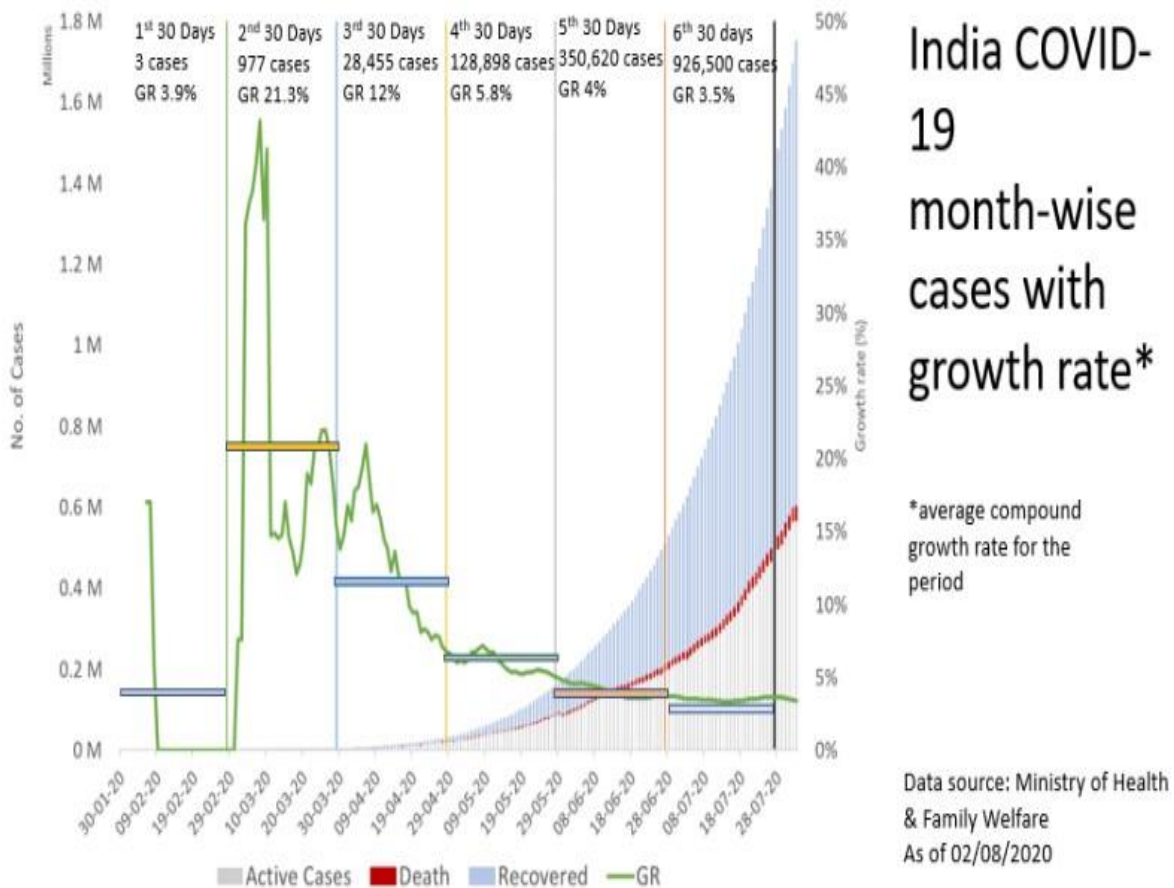
Figure 10: COVID-19 confirmed cases, active cases and deceased cases in top 20 cities or districts



Source: World Health Organization. 2020. "Novel Coronavirus Disease (COVID-19)\*." Situation Update Report 27. [https://www.who.int/docs/default-source/wrindia/situationreport/india-situation-report-27.pdf?sfvrsn=8d0d1850\\_2](https://www.who.int/docs/default-source/wrindia/situationreport/india-situation-report-27.pdf?sfvrsn=8d0d1850_2).



Figure 11: India COVID-19 month-wise active cases, recovered cases, growth rate and deaths



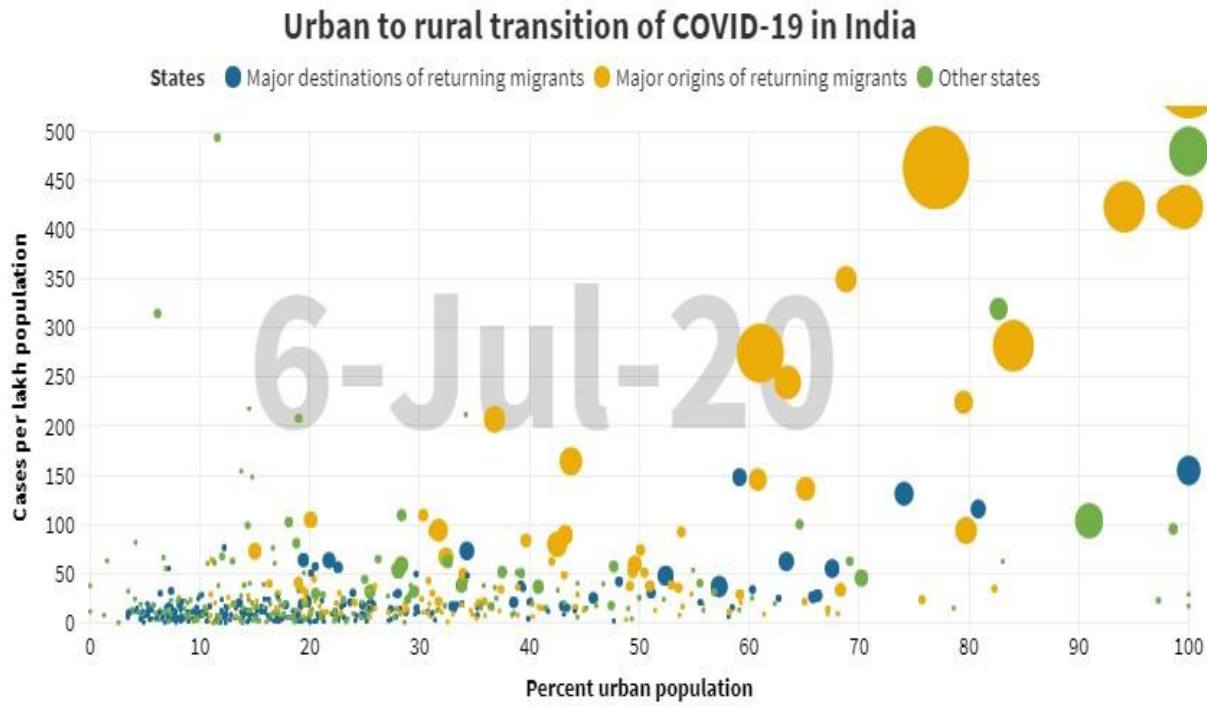
Source: World Health Organization. 2020. "Novel Coronavirus Disease (COVID-19)\*." Situation Update Report 27. [https://www.who.int/docs/default-source/wrindia/situationreport/india-situation-report-27.pdf?sfvrsn=8d0d1850\\_2](https://www.who.int/docs/default-source/wrindia/situationreport/india-situation-report-27.pdf?sfvrsn=8d0d1850_2).

An additional cause for alarm is the emergence of interior regions inside the country as new epicentres. COVID-19 positive cases are being progressively reported in four states in eastern India, including Odisha, Bihar, Assam, and West Bengal. Multiple instances have been documented in several districts of Bihar, namely Patna, Nalanda, Bhalagpur, Begusarai, Munger, and Gaya. COVID-19 is spreading to cities, towns, and rural regions outside of Greater Hyderabad in the state of Telangana (Pulipaka 2020). The mentioned districts are Rajanna-Sircilla, Nagarkurnool, Nalgonda, Suryapet, Nizamabad, Medchal-Malkajgiri, Sangareddy, Medak, and Warangal Rural. Uttar Pradesh has witnessed a surge of COVID-19 instances in many districts like Sonbhadra, Hardoi,

Sultanpur, Ballia, Meerut, as well as in the sacred cities of Varanasi and Prayagraj (Jafri 2020). The spike in COVID-19 cases in rural regions may be attributed to two primary factors: inadequate healthcare infrastructure and the influx of migrants who were not screened or had no symptoms. COVID-19 cases in the rural areas of Rajasthan and Karnataka have also experienced a rise (Mishra et al. 2020). Figure 12 illustrates the shift of COVID-19 from urban areas to rural areas in India. The principal destinations of returning migrants, namely Uttar Pradesh, Bihar, Madhya Pradesh, Rajasthan, West Bengal, Jharkhand, and Odisha, are witnessing a surge in the number of reported COVID-19 cases (Mishra et al., 2020).



Figure 12: Urban to rural transition of COVID-19 in India



Source: Mishra, Nand Lal, Kanupriya Kothiwal, Md Sayeef Alam, and Singh Akancha. 2020. "How to Stall COVID's March in Rural India." July 2020.

<https://www.downtoearth.org.in/blog/health/how-to-stall-covid-s-march-in-rural-india72358>.

## II. REVIEW OF LITERATURE

The initial instance of COVID-19 in India was documented on January 30th, 2020, specifically in the state of Kerala (Kachroo 2020; Vaman et al. 2020). Gupta et al. conducted a study on the clinical and epidemiological characteristics of the initial 21 COVID-19 patients in India. They discovered that the average age was 40.3 years and the majority of the patients were male (N. Gupta et al. 2020). The predominant clinical manifestations included pyrexia and cough, subsequently accompanied by pharyngitis, cephalalgia, and dyspnea (N. Gupta et al., 2020). On March 24, 2020, after the number of verified COVID-19 cases reached 500, the Indian government declared a statewide lockdown lasting 21 days (Pulla 2020; Press Information Bureau, Government of India 2020). Mahajan and Kaushal (2020) discovered that the age group most affected by COVID-19 during Lockdown 1.0 was 20-49, with a predominance of male patients. Barani et al. examined the characteristics of individuals diagnosed with COVID-19 throughout the period from January 22nd to April 30th, 2020. Researchers discovered that the incidence of the assault (per

million) was highest among those aged 50-69 years and lowest among those under 10 years old. Additionally, the attack rate was greater in men than in females. Furthermore, the secondary attack rate was found to be 6 percent (Barani et al., 2020). A surge in COVID-19 instances has been seen (Shetti et al. 2020). Following Lockdown 1.0, other lockdowns were implemented, namely Lockdown 2.0, Lockdown 3.0, and Lockdown 4.0. These lockdowns concluded on May 31, 2020, as stated by Ramachandran and Kalaivani (2020). In all stages of the lockdown, Maharashtra emerged as the primary location for verified COVID-19 cases in India, although Tamil Nadu, Punjab, and Kerala shown commendable performance in terms of successfully treating COVID-19 cases (Prabhakar et al., 2020). Existing literature presents several models that forecast the trajectory and consequences of COVID-19 in India.

Acharya and Porwal (2020) have identified certain districts in nine states, including Bihar, Madhya Pradesh, Telangana, Jharkhand, Uttar Pradesh, Maharashtra, West Bengal, Odisha, and Gujarat, that exhibit a high vulnerability to



COVID-19. Rafiq et al. forecasted that the ten most severely affected states in India, specifically Maharashtra, Gujarat, Tamil Nadu, Delhi, Rajasthan, Madhya Pradesh, Uttar Pradesh, Andhra Pradesh, Punjab, and Telangana, will have a significant increase in both COVID-19 cases and fatalities during June 2020 (Rafiq, Suhail, and Bazaz 2020). Several models projected a surge in COVID-19 cases in April, while others anticipated the end of the pandemic by July (Tiwari, Kumar, and Guleria 2020; Gupta and Pal 2020; B. P. Singh 2020; M. S. Ghosh 2020).

Nevertheless, models can just offer an approximation of the most unfavourable and optimal outcomes. According to the World Health Organisation (2020e), the number of cases is increasing daily. Tomar and Gupta employed a data-driven forecasting/estimation technique and discovered that using social isolation and lockdown measures can effectively mitigate the transmission of the corona virus (Tomar and Gupta 2020). Ray et al. employed a Bayesian variant of the Susceptible-Infected-Removed (eSIR) model to examine the immediate and enduring consequences of a 21-day nationwide shutdown in India (Ray et al., 2020). Research has shown that implementing a lockdown can have immediate benefits by reducing the number of COVID-19 cases and allowing for the necessary preparations of healthcare and disease monitoring systems. Furthermore, a lockdown lasting between 42-56 days can significantly flatten the curve of infection in the long run. Prinja et al. (2020) employed a susceptible-exposed-infectious-recovered (SEIR) model and determined that implementing a lockdown strategy effectively delays the occurrence of the peak of infections. This delay allows healthcare systems to adequately prepare for the surge in cases. Furthermore, it was discovered that enhancing the public health response system can effectively decrease the number of cases and the need for intensive care unit beds and ventilators (Prinja et al., 2020). Singh and Adhikari (2020) discovered that a three-week lockdown was inadequate in avoiding the reappearance of the virus. They recommended implementing a persistent lockdown with intermittent periods of leisure. Sarkar et al. proposed that quarantining individuals suspected of having COVID-19 can effectively decrease the basic reproduction number. Additionally, combining measures such as social distancing and contact tracing can aid in the eradication of the COVID-19 pandemic (Sarkar, Khajanchi, and Nieto 2020). Pujari and Shekatkar emphasised the need for strict oversight of domestic transportation,

as it can potentially expose a significant portion of the population to COVID-19 (Pujari and Shekatkar 2020). In their work, Khanna et al. proposed that implementing stringent containment measures, enhancing case identification, isolating infected individuals, enforcing quarantine, practicing social distancing, fostering community support, and avoiding large gatherings might effectively control the spread of the coronavirus (Khanna et al., 2020). Varghese and John highlighted the significance of community mitigation strategies, such as implementing social distancing measures, isolating individuals with COVID-19, quarantining their contacts, offering work from home alternatives, closing schools, and cancelling large gatherings, as effective approaches to address the pandemic (Varghese and John 2020).

In order to prevent the spread of COVID-19, the Government of India developed the National Containment Plan. This plan includes measures such as early detection through screening, providing primary care for mild cases of infection, and offering tertiary care for severe cases. Additionally, the plan emphasises the importance of health education through media to reduce person-to-person transmission of COVID-19 (Ramachandran and Kalaivani 2020). Multiple steps were implemented, including the development of quarantine centres, increasing laboratory capacity, enhancing monitoring methods, and utilising Artificial Intelligence for contact tracing (Khan et al., 2020). The government hospitals were expanded and private institutions were also engaged in the testing and treatment of COVID-19 (Kakar and Nundy 2020; Prasad 2020). According to Kakar and Nundy (2020), certain railway cars were repurposed into facilities for quarantining and isolating individuals. The treatment of COVID-19 patients mostly involves symptomatic management, such as the use of paracetamol to reduce fever. However, there have also been attempts to use a mix of medications, including anti-malarial, anti-Swine flu, and anti-HIV drugs (Prasad 2020). The implementation of public health interventions such as a countrywide lockdown, widespread education on hand hygiene, use of facial masks, and enforcement of social distancing measures were implemented (Zodpey et al., 2020). Wearing masks in public places has been mandated (Ramachandran and Kalaivani 2020). Both the federal government and state governments in India have introduced many mobile applications to control and manage the spread of COVID-19 (Bassi et al., 2020). Telemedicine has demonstrated its use as a valuable tool for facilitating doctor-





patient interaction during the COVID-19 pandemic (Koliyath et al., 2020; Das, Rani, and Vaddavalli, 2020). The Indian military forces initiated 'Operation Namaste' to support the government's efforts in combating COVID-19. They created many quarantine centres, isolation centres, and testing facilities around the nation (Sarla, 2020). The corporate sector and entertainment industry made substantial monetary contributions to assist the government in addressing the COVID-19 situation in the country (Sarla, 2020).

Thankappan provides a detailed account of how Kerala effectively handled the COVID-19 pandemic. Kerala successfully combated the COVID-19 outbreak by leveraging its previous experience in managing the NIPAH virus epidemic, following the guidelines set by the World Health Organisation, rapidly improving the state's health infrastructure, enforcing the Kerala epidemic disease act, implementing quarantine measures for all contacts, establishing community kitchens, promoting the "Break the Chain Campaign" to encourage hand washing, sanitization, and social distancing, providing financial assistance to vulnerable populations, and demonstrating strong political commitment (Thankappan 2020). Bidhan et al. also emphasise the Kasargod project, a triumphant COVID-19 containment strategy in the state of Kerala. Furthermore, the authors further delineate the intervention techniques employed to effectively control the spread of COVID-19 in the Bhilwara area of Rajasthan (Bidhan et al., 2020). Meghwal et al. provide a detailed account of the practical experiences of Rapid Response Teams (RRTs) in effectively controlling the spread of COVID-19 in Bhilwara. The successful outcome in Bhilwara was attributed to the strict enforcement of the cluster containment strategy, uncompromising containment measures, vigilant monitoring, effective leadership, and coordinated efforts across several sectors (Meghwal et al., 2020).

The impact of COVID-19 and the subsequent lockdown measures is substantial. Hospitals experienced a scarcity of personnel, medications, and medical equipment (Dore, 2020). As a result, additional emergency patients, such as pregnant women and cancer patients, have had negative consequences in receiving prompt medical care (Kundu and Bhowmik 2020; Dore 2020). There was a significant scarcity of N95 masks and personal protective equipment (PPE) for healthcare professionals, resulting in many migrant workers experiencing malnutrition (Kundu and Bhowmik, 2020). Social media exacerbated concerns regarding the shortage of masks and sanitizers,

discrimination against healthcare workers who treated COVID-19 patients, false assertions about herbal and immunity-enhancing medications, as well as the promotion of religious and spiritual methods for treating COVID-19 (Kadam and Atre 2020). The incidence of domestic violence against women escalated following the implementation of the lockdown (Vora et al., 2020). The implementation of lockdown measures in India has had a profound impact on the country's supply chain and economy (Agrawal, Jamwal, and Gupta 2020). Significant evidence of distress was observed in Micro, Small, and Medium Enterprises (MSMEs), as their output plummeted from 75% of capacity to a mere 11%, resulting in a 55% decline in employment (Rathore and Khanna 2020). The COVID-19 pandemic has had a severe impact on the tourist and hotel business (Patel et al., 2020). The complete transformation of the education system into a digital format has presented a problematic scenario for both students and instructors (Goswami, 2020). 'Herd mentality', characterised by unquestioningly following unreliable advice on hydroxychloroquine prophylaxis, and 'herd behaviour', exemplified by groups of migrants returning to their hometowns, congregations in religious gatherings, marriage ceremonies, and meetings led by 'super spreader' preachers, were observed in various regions of India during the lockdown period (A. K. Singh and Misra 2020). People are experiencing concerns due to a decrease in income, apprehension of contracting COVID-19, and the additional expenses associated with it.

study done by Roy et al. found that 12.5% of respondents experienced sleep issues, while 37.8% reported fear over contracting COVID-19 (Roy et al., 2020). Moreover, a study conducted by Roy et al. (2020) revealed that over 80% of the participants reported having perceived mental healthcare requirements. Sahoo et al. documented two instances of self-inflicted damage attributed to COVID-19 in India. Upon realising their exposure to a COVID-19 sufferer, both individuals had profound depression symptoms and made attempts to end their own lives (Sahoo et al., 2020). Dsouza et al. (2020) documented 69 cases of suicide related to COVID-19, which were attributed to a range of factors including fear of infection, financial difficulties, social isolation, discrimination, mandatory quarantine, positive COVID-19 diagnosis, work-related stress, inability to return home due to lockdown measures, and lack of access to alcohol. A study done by Gupta et al. revealed that those who witnessed COVID-19



positive cases in their cities are more susceptible to mental health problems compared to those who did not (D. P. Gupta, Rai, and Dang 2020). Additionally, a research has indicated that individuals, including healthcare professionals, who dedicate an inordinate amount of time to the COVID-19 outbreak are at a heightened susceptibility to mental disorder (Gupta, Rai, and Dang, 2020). The mental health issues faced by internal migrant workers are a cause for concern (Choudhari, 2020).

Although the negative effects of COVID-19 are extensive, the restrictions on mobility and activities have had a positive influence on the environment. The decrease in vehicular activity has resulted in a reduction in greenhouse gas emissions. As a result, air pollution levels have declined. The inactivity of industries has led to a decrease in waste emissions. Additionally, the demand for power in industries has decreased, resulting in a reduction in the use of fossil fuels (Gautam 2020; Chakraborty and Maity 2020; Srivastava et al. 2020). An additional positive outcome of the lockdown is the decrease in the occurrence of road traffic accidents, resulting in the preservation of numerous lives (Sarla 2020).

A study done in Delhi and Ahmedabad utilised antibody-based serological monitoring and found that the prevalence of antibodies was 23% in Delhi and 17% in Ahmedabad (Reddy 2020). Nevertheless, K Srinath Reddy urges prudence when interpreting the findings and states that due to the overestimation of false positive results in large-scale screening, the actual prevalence rates are likely to be lower than the published rates (Reddy 2020). Rajendra et al. performed a comprehensive study and determined that Convalescent Plasma Therapy (CPT) for COVID-19 is both safe and clinically efficacious, leading to a reduction in mortality (Rajendran et al., 2020). Nevertheless, the data suggests that well-executed multicenter clinical studies should be carried out to determine the effectiveness of CPT for COVID-19 (Rajendran et al. 2020). According to Tillu et al. (2020), using Ayurveda medicinal substances and practices such as drinking warm water, mouth gargling, nose oil application, and steam inhalation might decrease the likelihood of contracting a COVID-19 infection.

The development of a COVID-19 vaccine is now progressing rapidly. Bharat, India, Biological E, India, Zydus Cadila, India are part of the Developing Countries Vaccine Manufacturers Network (DCVMN) member businesses that are

actively involved in COVID-19 vaccine research and development (Pagliusi et al. 2020).

Bhatia and Abraham emphasise the key takeaways from the initial 100 days of the COVID-19 pandemic in India. They stress the significance of involving the public, establishing nationwide laboratory networks, and ensuring responsible participation of mainstream and social media in combating COVID-19 (R. Bhatia and Abraham 2020). Additionally, they propose the implementation of measures to strengthen health systems, ensuring that non-COVID-19 healthcare services are not compromised. Furthermore, policies should be devised to safeguard vulnerable older individuals. Tagat and Kapoor emphasise the significance of behavioural measures in reducing the transmission of Covid-19 in India. For example, police officers in certain places utilised "corona helmets" to increase awareness about COVID-19 among commuters. They also implemented social distancing measures by drawing circles and squares on the ground (Tagat and Kapoor 2020). To enhance psychological resilience against fear related to COVID-19, engaging in activities such as relaxation exercises, meditation, breathing exercises, yoga, pursuing hobbies, listening to music, reading quality literature, and obtaining professional assistance if necessary, might be beneficial (Chaurasiya et al., 2020). Zodpey et al. propose that governments should prioritise improving their preparedness and response systems, enhancing treatment and testing facilities to provide better care for patients, and expanding community and stakeholder involvement by including the private sector, voluntary organisations, civil society, and nongovernmental organisations (Zodpey et al., 2020).

#### **IMPACT ON MIGRANTS**

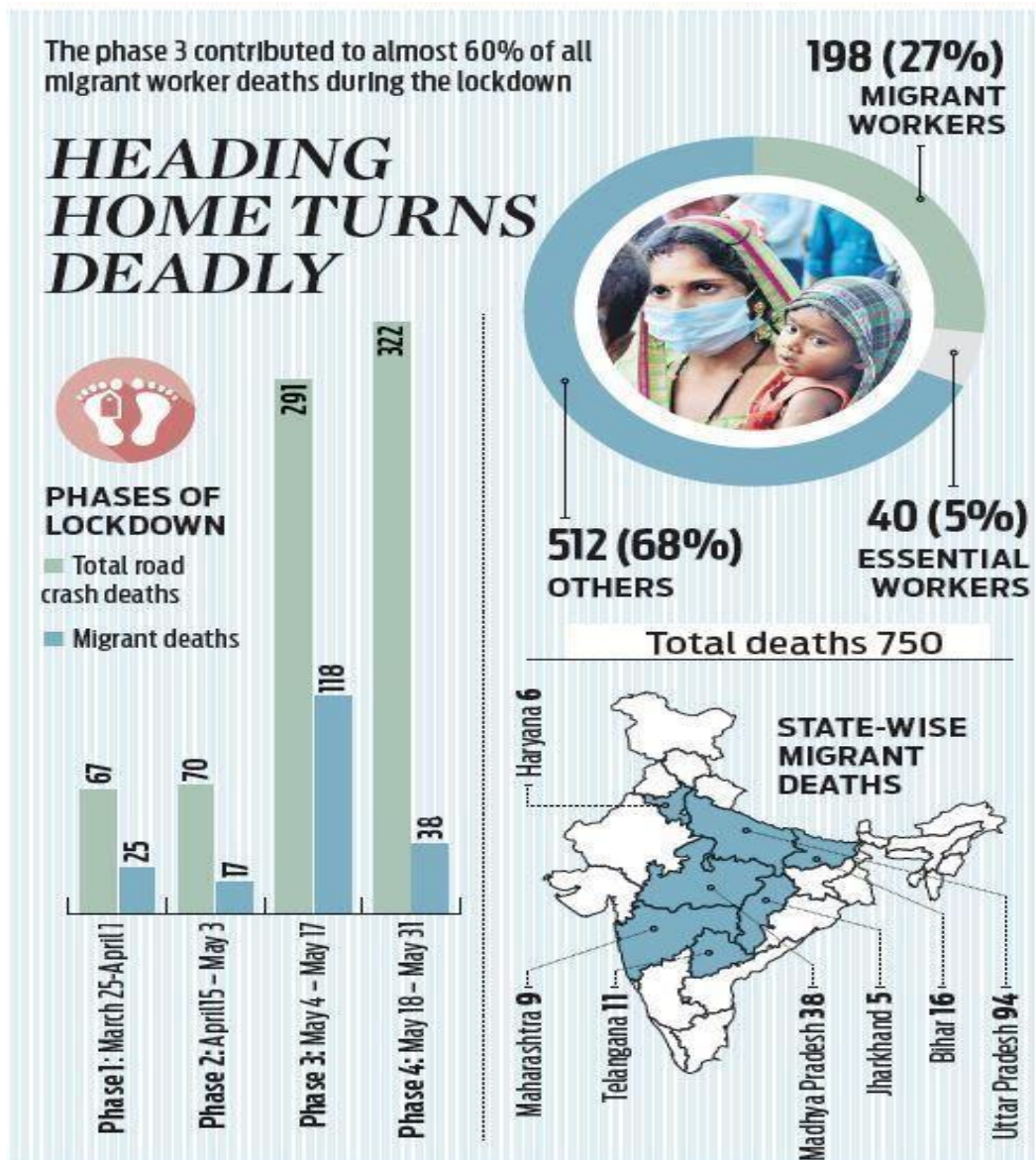
According to the World Economic Forum, India has over 139 million migrants residing within its borders. The majority of the migrants originate from the states of Uttar Pradesh, Bihar, Rajasthan, and Madhya Pradesh. Metropolises such as Delhi and Mumbai are highly appealing to migrants due to the quantity of employment prospects. The migrant community has been disproportionately affected by the lockdown and travel restrictions imposed as a result of the COVID-19 pandemic. As a result of the closure of factories, building sites, and other businesses, a significant number of migrants saw a substantial decline in their income and limited access to food. The loss of income caused other concerns, such as the inability to afford housing rent and uncertainty about their



future. As a result, this compelled a multitude of workers to return to their own rural hometowns. As a result of lacking transportation options, migrants were compelled to traverse thousands of kilometres on foot to return to their homes, leading to the starvation of many along the journey. A significant number of migrant workers perished as a result of

many factors such as starvation, accidents, excessive force by law enforcement, inadequate access to healthcare, and instances of self-inflicted harm (refer to figure 13). The source of this information is The New Indian Express from the year 2020.

Figure 13 : Migrant deaths during COVID-19



Source: The New Indian Express. 2020. "Most Migrants Died during COVID-19 Lockdown 3.0: SaveLife Foundation." June 2020.

<https://www.newindianexpress.com/nation/2020/jun/03/most-migrants-died-during-covid-19-lockdown-30-savelife-foundation-2151565.html>

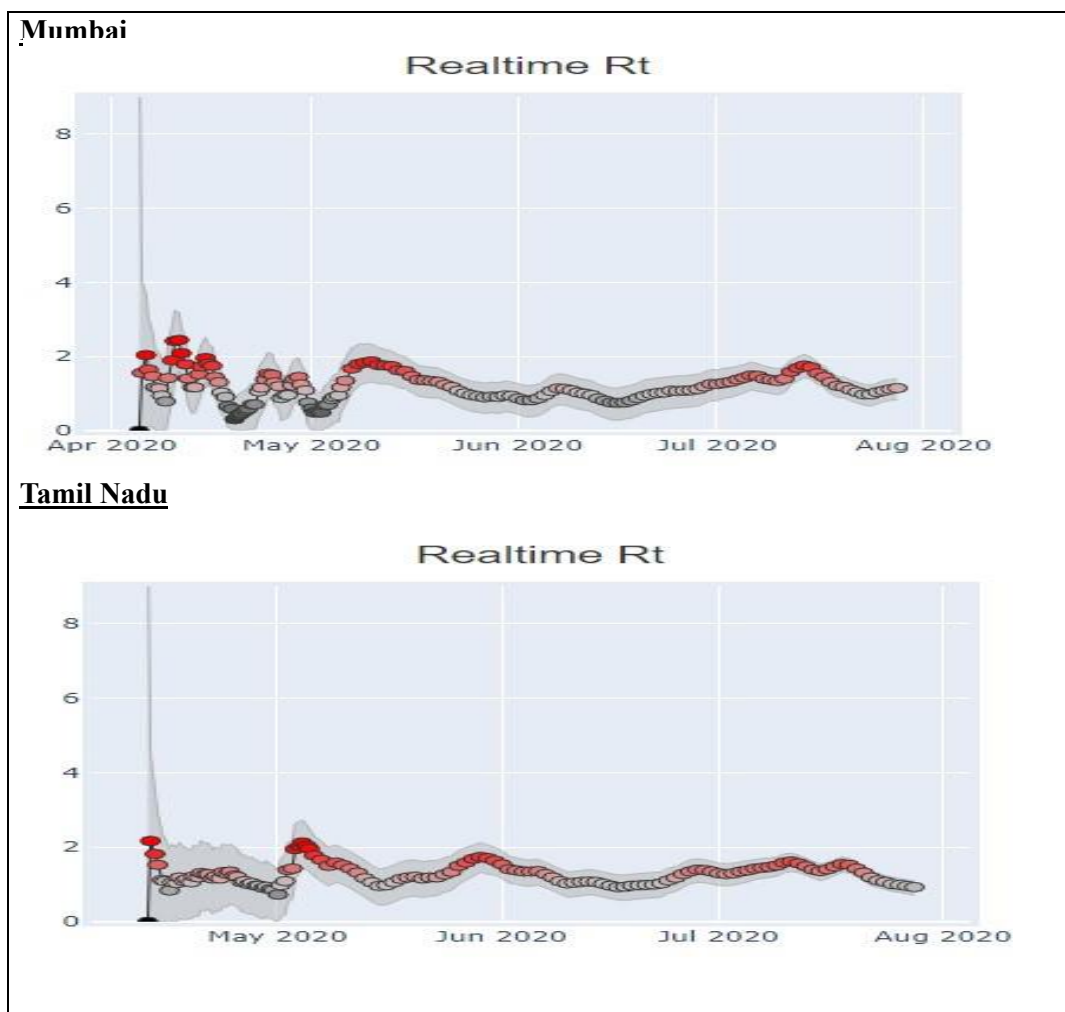


### COVID-19 R

R represents a crucial metric that quantifies the rate at which the virus is spreading. The term refers to the mean number of individuals that get an infection from a single diseased person.  $R_t$  is the transmission rate, which quantifies the number of individuals who contract a disease from an infected person at a specific period  $t$ . If the value of  $R$  exceeds 1.0, the virus will propagate rapidly.

When the value of  $R$  is less than 1.0, the transmission of the virus will cease. The value of  $R$  is a measure of the effectiveness of the efforts used to contain the epidemic. Figure 14 illustrates the COVID-19  $R$ -value in the most severely impacted states in India. India should prioritise tracking it as a dependent variable rather than only focusing on the recovery rate or the doubling time.

Figure 4: Statewise COVID-19  $R_t$







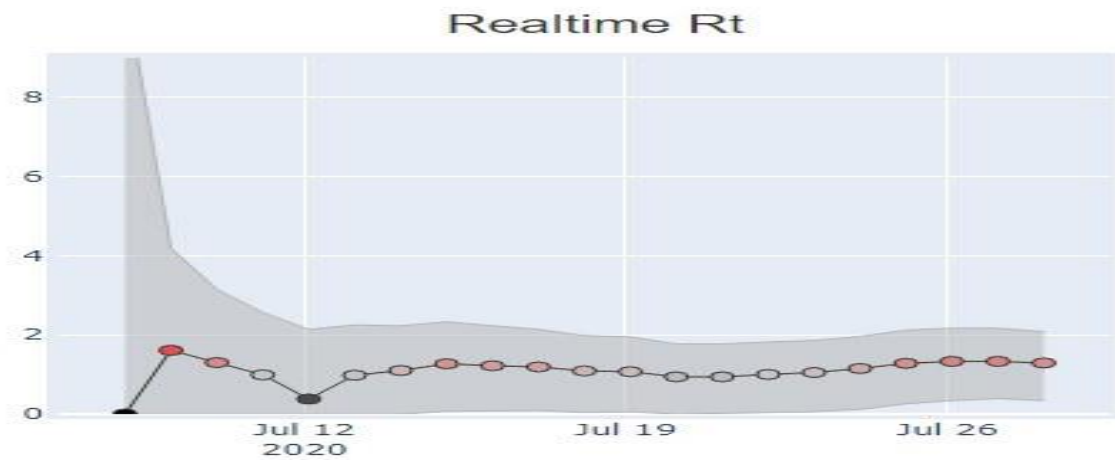
**Delhi**



**Gujarat**



**Karnataka**



Source: GitHub. 2020. "COVID-19 Rt Analysis in Indian Context." 2020.  
<https://parijat29.github.io/COVID-19-India-R0-Analysis/>.





### **CENTRAL GOVERNMENT INITIATIVES**

The Indian government promptly implemented appropriate measures following the identification of the first case in January. This encompassed the implementation of passenger screening measures at all airports around the nation, as well as the imposition of entrance restrictions for those flying from mainland China and other nations impacted by the outbreak. Upon arrival, all individuals travelling internationally were instructed to undergo a mandatory self-isolation period of 14 days. The Indian government has requested all states to implement the Epidemic Disease Act, which grants authorities the power to shut down public spaces and isolate those suspected of having COVID-19. A rigorous campaign was initiated, and instructions pertaining to quarantine, personal cleanliness, surveillance, contact tracing, diagnosis, and management were disseminated. As of March 20, 2020, all local and international flights were halted. The federal government declared a "Janta Curfew" (Peoples curfew) on 22nd March 2020 in order to acquaint inhabitants with the impending circumstances. On March 24, 2020, the Government of India declared a statewide lockdown for 21 days when the number of verified COVID-19 cases reached 500 (Press Information Bureau, Government of India 2020). The objective was to disrupt the spread of the virus and reduce the rate of infection. A COVID-19 Containment Plan was established. A 24/7 control room was established at the headquarters of the Director General of Health Service (DGHS) to handle inquiries on COVID-19. Throughout the 21-day statewide lockdown, the administration prioritised preparations for the impending and severe COVID-19 catastrophe. This encompassed the creation of COVID-19 hospitals, isolation wards, quarantine centres, and laboratory facilities. Emergency response teams were established to address imminent crises. The Government of India's Ministry of Health and Family Welfare has established a range of rules and advisories to promote widespread awareness and effectively manage the transmission of the lethal virus.

On March 26, 2020, the Union Finance Minister unveiled a relief package of INR 1,700 billion as part of the Pradhan Mantri Garib Kalyan Yojana, aimed at addressing the financial crisis in the country (Ministry of Finance, Government of India 2020). The scheme's prominent characteristics are outlined below:

➤ A Special insurance Scheme would provide coverage for safai karamcharis, ward-boys, nurses,

ASHA workers, paramedics, technicians, physicians, specialists, and other health personnel.

➤ Under the policy, any healthcare worker who encounters an accident while treating Covid-19 patients would receive compensation in the amount of Rs 5 million.

➤ In order to guarantee sufficient protein supply to all the persons indicated above, each household will get 1 kilogramme of pulses based on regional preferences for the next three months. The Government of India will give these pulses free of charge.

The PM Garib Kalyan Yojana will distribute petrol cylinders, at no charge, to 0.8 million impoverished households for the next three months.

Workers earning less than Rs 15,000 per month in enterprises with fewer than 100 employees are in danger of losing their jobs. As part of this plan, the government has suggested allocating 24 percent of individuals' monthly salaries to their Provident Fund (PF) accounts for the following three months.

➤ Approximately 30 million individuals who are widowed or have disabilities are at risk because to the economic upheavals created by the Covid-19 pandemic. The government would provide them with a sum of Rs 1,000 to help them overcome financial challenges over the course of the next three months.

The Government of India's initial response was well acclaimed for its promptness and strictness. India achieved a perfect score of "100" on the Oxford COVID-19 Government Response Tracker (OxCGRT). The reaction of India was commended by the United Nations and the World Health Organisation as being comprehensive and robust. Although India has a population of over 1.3 billion, it has a remarkably low rate of COVID-19 infections. There was a widespread belief that the low figures were due to insufficient testing, which prevented the accurate identification of the real number of illnesses and fatalities. Some individuals believed that the implementation of a 21-day shutdown was essential in controlling the spread of the epidemic. Some cited India's protective attributes, such as the robust immunological response of its population and the elevated levels of warmth and humidity. Many people attributed this phenomenon to demography, as a comparable low death rate was also being noticed in other South Asian nations such as Bangladesh and Pakistan. Although India's swift implementation of a statewide lockdown received widespread acclaim, there were those who believed that the Indian government did not pass this test of the epidemic.



This is due to the challenges encountered by workers in the informal sector throughout the duration of the statewide lockdown. These labourers had significant hardships in all areas - physically, financially, and emotionally. As a result of the impromptu declaration of a lockdown and the cessation of all forms of transportation, migrants were compelled to traverse hundreds of miles on foot in order to reach their towns. To facilitate the departure strategy from the statewide lockdown, the districts in India were categorised into three zones - Green, Red, and Orange, depending on the number of cases. Conditional relaxations were granted in Green and Orange Zones after April 20th, 2020. In the new instructions released by the government of India, two more zones - the containment zone and the buffer zone - were included within the red and orange zones.

The Indian government initiated the 'Vande Bharat Mission' on May 7th, 2020, with the objective of repatriating Indian people who were unable to return to the country due to travel restrictions imposed as a result of the COVID-19 pandemic. It was the largest evacuation practice ever conducted. The Mission prioritised citizens with strong reasons for repatriation, such as unemployment, visa nonrenewal, the death of a family member, tourists, students affected by the closure of colleges and hostels, and medical emergencies (Drishti The Vision Foundation,

2020). The Mission was implemented in a sequential fashion, divided into four phases (Phase 1–Phase 4). The mission commenced on May 7th, 2020, and involved the evacuation of citizens from multiple countries, including the UAE, USA, Singapore, Bangladesh, Saudi Arabia, Kuwait, Oman, Malaysia, Qatar, Philippines, UK, Bahrain, Armenia, Australia, Egypt, Indonesia, Italy, Kazakhstan, Kenya, Nigeria, Netherlands, New Zealand, Nepal, Russia, Sri Lanka, Thailand, and Ukraine, among others (Ministry of External Affairs, Government of India, 2020).

The Indian Navy initiated Operation 'Samudra Setu' as a component of the 'Vande Bharat Mission' with the objective of repatriating Indian nationals who were trapped in the Maldives. The Indian Navy operated two ships, NS Jalashwa and INS Magar, starting from May 8th, 2020 (Javaid 2020).

On May 12, 2020, the Prime Minister of India unveiled a Rs 20 Lakh crore economic package as part of the 'Aatma Nirbhar Bharat Abhiyaan' initiative by the Government of India in 2020. The Abhiyan is centred around the objective of achieving self-sufficiency in India. The Prime Minister urged Indians to view the COVID-19 problem as a chance to prioritise indigenous products and promote economic self-sufficiency in India. The Five Pillars of Atma Nirbhar Abhiyan are outlined in Table 1.

**Table 1:** Five Pillars of Atma Nirbhar Abhiyan

| Pillar         | Description  |
|----------------|--|
| Economy        | An economy that brings Quantum Jump rather than Incremental change   |
| Infrastructure | An infrastructure that became the identity of modern India   |
| System         | A system that is driven by technology which can fulfill the dreams of the 21st century; a system not based on the policy of the past century |
| Demography     | Our Vibrant Demography is our strength in the world's largest democracy, our source of energy for self-reliant India                         |
| Demand         | The cycle of demand and supply chain in our economy, is the strength that needs to be harnessed to its full potential                        |

Source: Government of India. 2020. "AatmaNirbhar Bharat Abhiyan." AatmaNirbharBharat Abhiyan - Transforming India. 2020. <https://transformingindia.mygov.in/aatmanirbharbharat/>.

of response to the ongoing increase of COVID-19 cases, the Indian government implemented an Intelligent Testing plan (ETHealthworld 2020). The plan emphasised the importance of establishing a

nationwide infrastructure for testing facilities and services in order to track and stay ahead of the coronavirus. This entailed the dissemination of TrueNat machines for COVID-19 testing,



acquisition of COBAS-8800 equipment, and the enlargement of laboratories and testing infrastructure throughout the country. The federal government has provided complete assistance to the state governments in managing the COVID-19 crisis. The federal government has aggressively assisted the North Eastern states in setting up testing facilities, COVID hospitals, and other healthcare infrastructure to address the COVID-19 pandemic (Ministry of Health & Family Welfare, Government of India 2020). India's Minister for Science & Technology, Earth Sciences inaugurated the country's first Infectious illness diagnostic lab (I-lab) for Covid testing in remote and inaccessible

areas on June 18, 2020 (Ministry of Science & Technology, Government of India 2020).

Between June 1, 2020 and June 30th, 2020, the Ministry of Home Affairs (MHA), Government of India released rules for Unlock 1, which allowed for the reopening of territories that were not under the Containment Zones. On June 26, 2020, the Prime Minister of India inaugurated the 'Aatma Nirbhar Uttar Pradesh Rojgar Abhiyaan'. The project aims to offer employment opportunities to migratory workers who have lately returned to the state of Uttar Pradesh as a result of the epidemic. The initiative will help almost ten million foreign workers. The Government of India published Unlock 2 guidelines on July 1st, 2020.

Figure 15: India's First Infectious disease diagnostic lab (I-Lab)



Source: Ministry of Science & Technology, Government of India. 2020. "Dr Harsh Vardhan Launches DBT – AMTZ Mobile Diagnostic Unit for Covid Testing- I-Lab [Press Release]." <https://pib.gov.in/PressReleasePage.aspx?PRID=1632393>.

### ICT INITIATIVES

The Central Government has implemented many Information and Communication Technology (ICT) initiatives to address the COVID-19 issue in the country. In order to disseminate information to a large audience, the Department of Telecom, Government of India has introduced COVID-19 awareness messages as a caller tune, replacing the usual ringtone (Times of India, 2020). Furthermore, the Government of India has provided a variety of reliable information websites. Some of the platforms that provide information and services related to the government of India include MyGov Portal, National Health Portal of India, the Ministry of Health and Family Welfare website, a WhatsApp bot named MyGov Helpdesk (WhatsApp Number: +919013151515), and MyGov Social Media Hub.

These platforms are managed by the Ministry of Communications & Information Technology (Government of India) in 2020. In addition, the federal government has introduced public interaction systems like as the MyGov App and the COVID-19 feedback app. The Aarogya Setu App and Aarogya Setu IVRS have been developed by the National Informatics Centre (NIC), under the Ministry of Electronics and Information Technology, Government of India, with the specific aim of contact tracing (National Informatics Centre, Ministry of Electronics & Information Technology, Government of India 2020). The SAHYOG app has been developed by the Survey of India (SOI), which is India's National Mapping Agency (NMA) under the Department of Science & Technology, Government of India. The app



serves the goal of contact tracing, public awareness, and self-assessment.

#### **STATE GOVERNMENT INITIATIVES**

India recorded their inaugural COVID-19 case in the state of Kerala on January 30th, 2020. By February 3rd, 2020, the number had increased to 3, with all three instances being students who had returned from the city of Wuhan, China. The number of COVID-19 cases increased significantly in March as several tourists and Indian nationals returning from afflicted regions tested positive for the virus. In March, state governments in India proclaimed a state of emergency and ordered the closure of schools, universities, malls, gyms, movie halls, and other public areas. The state governments gave essential advice and directions. Helpline lines were established by the state. The state governments implemented the trace-test-treat strategy to mitigate the transmission of the coronavirus. The state governments built designated COVID-19 care centres, hospitals, and laboratory facilities. Quarantine facilities were established at schools and hotels.

In response to the COVID-19 issue, the Uttar Pradesh Government has declared a financial assistance programme providing a monthly payment of INR 1000 to daily wage workers who are officially registered with the labour department (International Labour Organisation 2020). The Government of West Bengal has implemented the Snehar Paras initiative, which provides a financial assistance of INR 1000 to migrant workers who are residents of West Bengal but were unable to return owing to the COVID-19 pandemic (Gul, 2020). Several state governments allocated funding to build communal kitchens. Uttar Pradesh implemented large-scale communal kitchens. The government set up 7,368 community kitchens across 75 districts, each producing 12 lakh food packages every day. Uttar Pradesh was the pioneering state in the nation to geographically

map these institutions on Google Maps, aiming to provide convenience to the beneficiaries (Press Trust of India 2020b). Kerala state also set up 1,255 Community Kitchens in 14 districts, providing 2.5-2.8 million food packages every day. The objective of these communal kitchens is to provide universal freedom from hunger. These communal kitchens specifically cater to vulnerable segments of society, such as migrant labourers and homeless individuals. Community kitchens are operated through partnerships with the civil society, non-governmental organisations, religious institutions, local self-governing entities, and volunteer organisations. Several state governments have declared financial compensation for frontline personnel, like as healthcare professionals, sanitation workers, and police officers, in the event that they contract and succumb to the virus while doing their duties. The Delhi Government has declared a compensation of INR 1 Crore, while the Gujarat Government has given help of Rs 25 Lakhs.

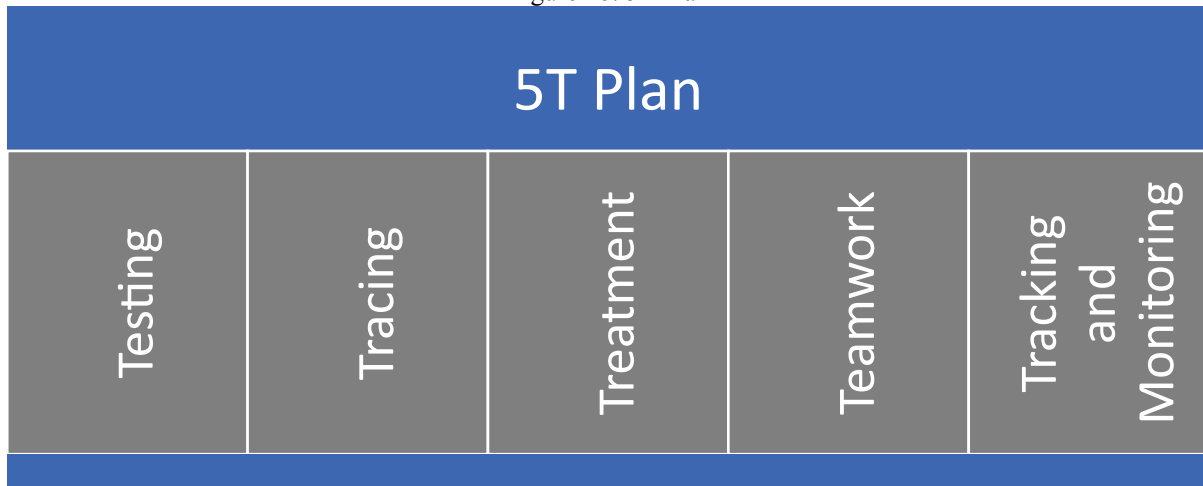
#### **5T PLAN**

The Delhi government implemented the 5T Plan to manage and mitigate the spread of COVID-19 in the National Capital (refer to Figure 16) (Kaushik, 2020). The first "T" represents "Testing," which entails performing rapid tests in areas with high infection rates. The second "T" represents "Tracing," which involves identifying individuals who have been in contact with COVID-19 patients. The third "T" represents "Treatment," encompassing the medical care provided to COVID-19 patients. The fourth "T" represents "Team Work," emphasising the importance of collaborative efforts. Lastly, the fifth "T" represents "Tracking and Monitoring," which involves actively monitoring and recording all activities aimed at controlling COVID-19 in the National Capital.





Figure 16: 5T Plan



Source: Kaushik, Devanshu. 2020. "Delhi Govt. Launches 5T Plan to Contain COVID-19 Crisis." April 2020. <https://currentaffairs.adda247.com/delhi-govt-launches-5t-plan-tocontain-covid-19-crisis/>.

### ICT INITIATIVES

The state governments have been actively utilising information and communication technology (ICT) to manage and regulate the COVID-19 situation. They have developed a range of mobile applications to achieve mass awareness, disseminate information, conduct contact tracing, and monitor those under quarantine. Table 3 includes a handful of these mobile applications.

Table 3: Mobile applications launched by various state governments

| State     | Name of the mobile application | Purpose  |
|-----------|--------------------------------|--|
| Delhi     | Delhi Corona                   | Provides real time information on the availability of beds and ventilators at both government and private hospitals, COVID-19 cases and number of tests conducted, government orders, containment zones, COVID-19 Health Services, and lockdown services like finding a hunger relief centre or a shelter or to apply for ration; a platform to donate to the Chief Minister/ Lt. Governor relief Fund |
| Punjab    | COVA Punjab                    | Provides access to real time dashboard for COVID-19 statistics, helpline numbers, prevention measures, government advisories, travel instructions; a geofencing app; a platform for self-screening for COVID-19 and locates nearest COVID-19 hospital  |
| Telangana | T-COVID'19                     | Provides live COVID-19 statistics, access to government and WHO advisories, details related to government approved labs and test centers, isolation wards in government and private hospitals and quarantine centers; self assessment for COVID-19 ; a telemedicine platform   |
| Kerala    | Gok Direct Kerala              | Generate awareness and disseminate credible information related to COVID-19  |
| Goa       | Test Yourself Goa              | Assists in carrying out a self assessment test for COVID-19  |
| Karnataka | Test Yourself Karnataka        | Assists in carrying out a self assessment test for COVID-19  |





|                  |                          |  |
|------------------|--------------------------|--|
| West Bengal      | Sandhane                 | Trace COVID-19 suspects in rural and remote areas  |
| Maharashtra      | MahaKavach               | Geofencing app: Helps track movement of COVID-19 suspect in quarantine   |
| Tamil Nadu       | Quarantine Monitor       | Geofencing app: Helps track movement of COVID-19 suspect in quarantine   |
| Karnataka        | Corona Watch             | Geofencing app: Helps track movement of COVID-19 suspect in quarantine   |
| Himachal Pradesh | Corona Mukh Himachal     | Geofencing app: Helps track movement of COVID-19 suspect in quarantine   |
| Gujarat          | SMC COVID-19 Tracker App | Geofencing app: Helps track movement of COVID-19 suspect in quarantine   |
| Mizoram          | mCOVID-19                | Provides access to COVID-19 updates, government advisories, task force and volunteer registration, volunteer mPASS (pass to permit movement of goods, vehicles and people); a geofencing app |

Source:(Mitter 2020; Anand 2020; ET Wing, Govt of Telangana 2020; Mizoram State e-Governance Society 2020; Press Trust of India 2020a; Nag 2020; ETGovernment 2020)

State governments have deployed robots to combat the COVID-19 pandemic. The Kerala Government has implemented the utilisation of robots named 'KARMI-Bot' and 'Nightingale-19' (A. Bhatia 2020; Zachariah 2020). These robots provide sustenance and medication to COVID-19 patients, gather waste generated by the patients, provide video communication between patients and medical professionals or family members, and carry out decontamination procedures in the isolation ward. The 'Milagrow iMap 9' is a robot specifically created for the purpose of disinfecting floors. Currently, it is undergoing a pilot test at the All India Institute of Medical Sciences (AIIMS) in New Delhi (Press Trust of India 2020c). Robots have also been utilised in other places such as Tamil Nadu and Jaipur. States are also investigating the use of drones for tasks such as sanitization and tracking the movement of individuals. States are considering the utilisation of remote monitoring devices to monitor COVID-19 patients. The mentioned technological advancements are the Indore 311 mobile app developed by the state of Madhya Pradesh, the Monal 2020 app developed by the state of Uttarakhand, the Milagrow Humanoid ELF robot implemented in AIIMS, New Delhi, and the LiFi (Light Fidelity) technology introduced in Ahmadabad (Press Trust of India 2020c; Vora 2020; Express News Service 2020). These remote monitoring devices allow the remote monitoring of vital parameters in patients, such as pulse rate, blood oxygen level, body temperature, respiration rate, and heart rate.

## CHALLENGES

The economic impact of COVID-19 is substantial, as seen by the implementation of lockdowns, workplace closures, and loss of income. The government's income has experienced a significant decline. Numerous enterprises have experienced significant financial losses. Furthermore, there are difficulties associated with insufficient public health infrastructure, substandard working conditions, a scarcity of protective kits, and an overwhelming number of staff in healthcare institutions. The difficulties are especially pronounced in small municipalities and rural regions. Amidst the global COVID-19 pandemic, the majority of nations are grappling with the intertwined challenges of public health and the resulting economic decline. However, India is confronted with an extra formidable issue, which is a significant dilemma involving migrant labour. The long-term consequences of this home movement are difficult to determine, but several observations were evident to us in early May:

- Migrant workers face a lack of significant job opportunities in their villages upon returning home.
- The agriculture sector is already saturated with workers, leaving little room for employment.
- Most states lack major agro-based industries in rural areas that could potentially hire these returning workers.
- While being with their families provides some relief, the lack of earnings will push millions of workers back into poverty.



- Within weeks, these workers will be eager to return to their city jobs, but the timing of job availability remains uncertain.
- Cities will face significant challenges in returning to normal without these workers.

### III. RECOMMENDATIONS

In order to provide job prospects for migrant workers, we suggest that the government should contemplate implementing the following measures in the latter part of May:

- The federal government should develop and finance significant public infrastructure projects, while the states should assist in their execution.
- These projects should primarily focus on rural areas, such as constructing roads, excavating ponds for rainwater harvesting, planting trees, involving workers in the Prime Minister's affordable housing programme, considering the establishment of small-scale agro-based industries, and implementing solar panelling where necessary.
- It is highly unlikely that a large number of jobs will return to cities, so it is crucial to generate employment opportunities in rural areas. Agro-based industrialization will create significant interconnections with both upstream and downstream sectors, resulting in substantial benefits for rural communities.

The aforementioned is similar to the establishment of the Civilian Conservation Corps (C.C.C.) by President Roosevelt in the United States of America during the Great Depression. When President Franklin Roosevelt established the Civilian Conservation Corps (C.C.C.) in 1933, he was confronted with the same predicament we face today: the potential for a generation of young individuals to be lost. The president, who prioritised conservation, proposed the employment of young men who were unemployed for initiatives focused on forestry, soil conservation, and recreation. By 1942, the "Roosevelt's Tree Army" had successfully planted over three billion trees, constructed several parks and wildlife refuges, and finished thousands of miles of paths and roads.

### LESSONS TO BE LEARNT

Given the current knowledge regarding COVID-19 and the experiences of many nations, below are some valuable insights that India may gain in order to reduce the impact of the disease:

1. The assertion that more testing results in a higher number of instances is an erroneous claim. The statement simply implies that there is a

significant number of confirmed positive cases present, regardless of whether they have been tested or not. Therefore, it is necessary to do further testing in order to effectively trace contacts and implement appropriate corrective measures.

2. The only way to control the pandemic until an effective vaccine is created and distributed is to implement essential public health measures, including as wearing a mask when outside, maintaining social distance, avoiding big gatherings, and practicing frequent handwashing, among other precautions.

3. To ensure the success of a containment and recovery plan, it is crucial to prioritise the rate of infection. Public health interventions can reduce the effective reproduction number ( $R$ ) to a value less than 1. In addition to tracking the infection rate, it is crucial to closely monitor the positive rate and the case fatality ratio (death rate) rather than relying heavily on the recovery rate.

4. India must formulate an epidemic control plan to effectively restrict and manage the spread of the infection within the country, which is currently lacking.

5. Generally, the government or public sector have the most suitable resources, including both human and financial, to effectively handle a public health crisis of this magnitude.

Therefore, it is imperative that, similar to South Korea's approach, all testing should be provided at no cost, conducted on a far larger scale, and accompanied by comprehensive contact tracing.

In India's public health system, there are over 900,000 community health professionals known as the Accredited Social Health Activists (ASHAs). If the ASHAs are well compensated and educated, they can serve as a highly valuable human resource for accurately identifying possible cases and doing contact tracing. This is particularly crucial given the current surge in COVID-19 cases in rural areas of India. Evidence from various countries indicates that prematurely easing lockdown measures and neglecting preventive measures such as wearing masks, maintaining physical distance, attending large gatherings, or being indoors (e.g., in restaurants or bars) are highly likely to contribute to the spread of the infection .

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