

Regional Characteristics of COVID-19 Infection Trends 2020 in India

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Abstract This study reveals the regional characteristics of COVID-19 infection trends in India in 2020 through GIS mapping. Analysis of COVID-19 infection trends by the state and month showed that Maharashtra, Gujarat, and Delhi accounted for the majority of cases until April. In May, the increasing numbers of cases in Gujarat began slowing down, while a large increase was seen in Tamil Nadu; this trend continued in June. In July and August, there was a rapid increase in the number of infections in Karnataka and Andhra Pradesh, in southern India. In September, the pace of increase in these two states slowed, and the number of new infections throughout India began to decline in October. In contrast, an increase in Kerala, which had not seen many cases until September, became noticeable, and in December it became the state with the highest number of new infections. State-wise trends in COVID-19 infection in India show certain regional characteristics by month, which are also related to infection trends throughout India.

Key words COVID-19, spatial pattern, GIS, India

I. Introduction

This study examines the regional characteristics of COVID-19 infection trends in India through geographical information system (GIS) mapping, using the year 2020 as the period of analysis.

Since the outbreak in Wuhan, China, in December 2019, COVID-19 infections have spread rapidly worldwide. As of August 2021, there is still no sign of an end to the crisis, which affects the world in many ways. According to data compiled by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University,¹ the total number of COVID-19 infections worldwide as of August 1, 2021, was 197,784,812, and the number of deaths was 4,220,611. Looking at the total number of infections by country, the United States reported the highest (34,978,276), followed by India (31,615,824),² Brazil (19,917,855), France (6,199,334), and Russia (6,185,249).

Given the caseload, some studies have been conducted to analyze COVID-19 infection in India from a geographical perspective.³ Murugesan et al. (2020) and Machireddy (2020) examined the distribution of infection, recovered cases, and deaths by the state through GIS mapping. Meer and Mishra (2021), using Jammu and Kashmir as a case study, showing the distribution of infections by the district. Some studies have analyzed the distribution of infection in a time series (Kumar et al., 2020); Bag et al. (2020) showed the time and space patterns of the spread of infection using spatial statistical analysis. Similarly, the

authors analyzed the time series of infection trends by the state and the district⁴ from January 2020 to August 1, 2020 (Katsumata and Tsukimori, 2020).

Conversely, some studies have attempted to elucidate the regional factors that define the distribution of infection. Gupta et al. (2020) analyzed natural conditions and population density as indicators, suggesting that infections tend to flourish in regions with relatively high temperatures but low humidity and low elevation.⁵ Studies that assessed the risk areas for infection within cities were also conducted. Specifically, some researchers used Jaipur (Kanga et al., 2020, 2021) and Kolkata (Nath et al., 2021) as case studies. The analysis of these studies is characterized by the use of remote sensing in addition to GIS, and by a focus on specific cities to provide a more detailed regional analysis. Moreover, Mishra and Singh (2021) examined the changes and challenges for India under the COVID-19 pandemic from multiple perspectives.

Similar to our previous study (Katsumata and Tsukimori, 2020), this study used GIS to create epidemic maps and analyze the regional characteristics of COVID-19 infection trends in India. The period of analysis was from January 30, 2020, when the first infection was identified in India, to December 31, 2020. Because the period of analysis in Katsumata and Tsukimori (2020) did not begin until August 1, 2020, this study includes an analysis of subsequent infection trends. In addition, the spatial analysis was conducted at the state level, and the number of infections per month was captured in a time series. In this

study, the term “state” is used to include the union territories. This allowed us to identify the regional characteristics of COVID-19 infection trends in India in 2020.

The structure of this study is as follows. In Section II, the data used in this study are explained. Next, in Section III, the trends of COVID-19 infection in whole of India are reviewed in chronological order. In Section IV, the trends by the state and month are analyzed. Finally, the findings of this study are summarized in Section VI.

II. Data

The data used for the analysis in this study were collected by covid19india.org and provided through its website.⁶ This organization is not public but collects data primarily from information provided by the government of India and the states. The website conveys information about COVID-19 and provides the collected data in API document and CSV file formats. These data may be downloaded and used freely.

These data were provided in several spreadsheets. The contents of each data point are described in Katsumata and Tsukimori (2020), so the details are not described here. In this study, we used two sheets from this dataset: “case time series” and “state-wise daily.” “Case time series” shows the number of new infections, total infections, new recovered cases, total recovered cases, new deaths, and total deaths per day for India as a whole, while “state-wise daily” shows the number of new infections, new recovered cases, and new deaths per day, by the state. The data used in this study were limited to the number of infections.

Although these data were collected from multiple sources, they are useful for geographical studies because they provide a time series of data that includes geographical information.⁷ In addition to Katsumata and Tsukimori (2020), some studies have used data from covid19india.org (Gupta et al., 2020; Meer and Mishra, 2021), and its use in academic studies is also increasing.

Arc GIS 10.6.1 was used to map these data. The map data for state boundaries were purchased from ML Infomap (Delhi, India). The state and the district boundaries included in this map were based on the 2011 Census of India.

However, there are some problems in using this map data. That is the treatment of states whose administrative divisions have changed since 2011. For example, Telangana was separated from Andhra Pradesh in 2014, and Jammu & Kashmir was divided into the union territory of Jammu & Kashmir, and the union territory of Ladakh, in 2019. In addition, in 2020, the union terri-



Figure 1. States of India

tory of Dadra & Nagar Haveli and the union territory of Daman & Diu were merged. Of these, Telangana and Andhra Pradesh are considered independent states, and their map data were restructured. Jammu & Kashmir were considered states as of 2011 because of the difficulty in restructuring their map data to separate the boundaries. In the covid19india.org data, the union territory of Jammu & Kashmir and the union territory of Ladakh are aggregated separately; thus, the figures for both were combined for our analysis. Data on infections in the union territory of Dadra & Nagar Haveli and the union territory of Daman & Diu are counted separately on covid19india.org, and thus, map data are handled according to the boundaries in 2011. Therefore, the geographic boundaries used in this study delineate 36 states, as shown in Figure 1.

III. COVID-19 Infection in India

Figure 2 shows the number of new infections and total infections by week from January 30, 2020 to January 2, 2021. Although daily data on the number of infections is provided, the data are disaggregated by week to observe the time series characteristics more clearly.⁸

In India, the first infection was confirmed on January 30, 2020, with two cases in the week of February 2, after which there were no further infections until March. The number of infections began increasing in March, with 2,665 new infections in the week of March 29.

In the week of April 19, the number of new infections reached 10,000; in the week of May 3, 20,000; in the week

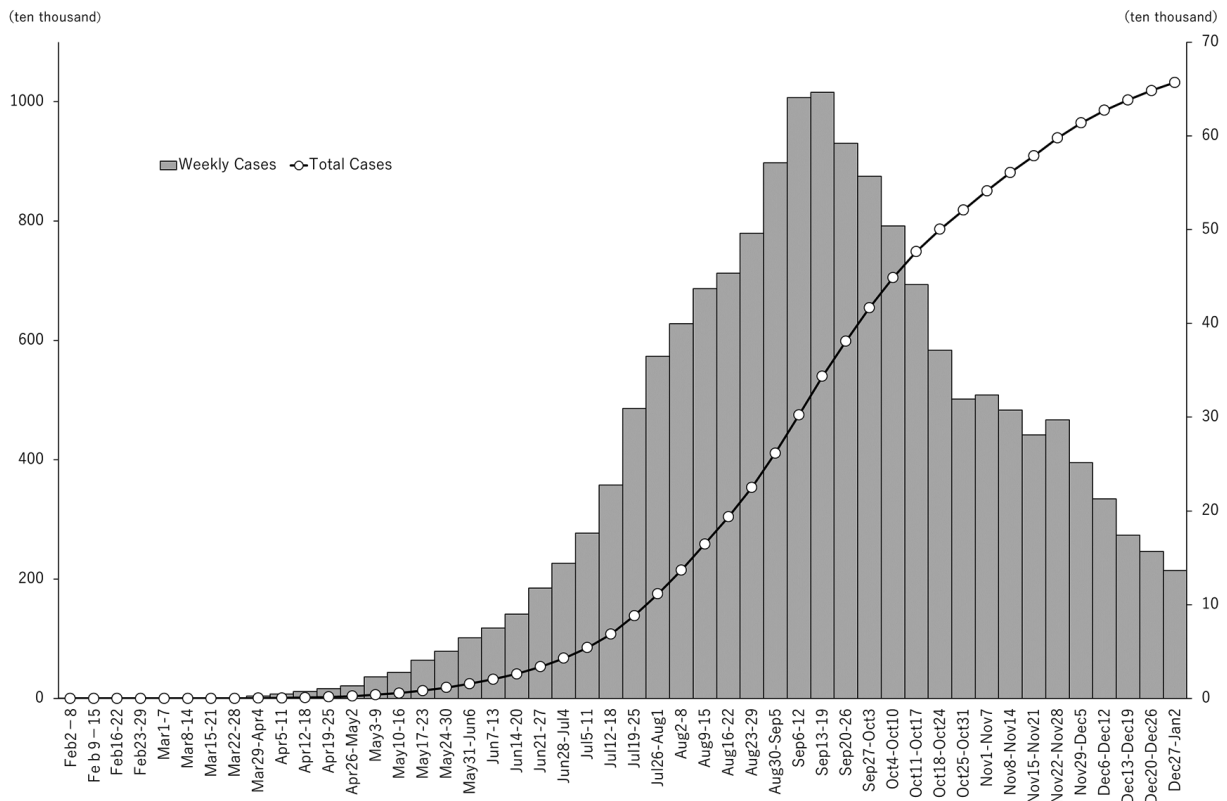


Figure 2. Trend in COVID-19 infection in India in 2020

Source: Based on data from covid19india.org.

of May 24, 50,000; and in the week of June 21, 100,000. The total infections in the week of June 21 exceeded 500,000, a significant increase from May. The subsequent spread of infection was remarkable, with the number of new infections reaching 200,000 in the week of July 12 and 496,276, or nearly half a million in the week of August 23. This increase continued until the week of September 13, when the total number of new infections reached 6,464,425, the peak of the infections in 2020. The total number of infections until then was 5,398,239.

Since then, the number of new infections has fallen almost consistently, and by the week of October 11, the number of new infections was below 500,000 to 441,217. The number of new infections fell to 400,000 in the following week, to 300,000 in the week of November 15, and below 200,000 in the week of December 13. In the week of December 27, the number of new infections was 136,221, settling down to the same rate of infection as in the second half of June. The total number of infections in India by December 31 was 10,286,234, exceeding 10 million.

IV. Trends in COVID-19 Infection by State

In this section, we examine the trends in the number of new COVID-19 infections by the state over time. The time series is divided into months, but because of the

low number of new infections from January to March, we combined them in April. In addition, the data on the number of new infections by the state includes figures for some months in which the infected state is unclear or unknown. Therefore, in some months, the total number of new infections may not match the figures in the whole of India data used in the previous section.⁹ However, we do not consider this to be a limitation because the differences do not significantly affect the analysis. For these reasons, it should be noted that when referring to the number of infections at the national level in this section, the figures might not necessarily correspond to those reported in the previous section.

1. From January to April

Figure 3 shows the number of new COVID-19 infections between January and April 2020. The total number of new infections during this period was 34,867.

Maharashtra had the highest number of new infections (10,498), accounting for 30.1% of the national total. Gujarat and Delhi followed with 4,395 (12.6%) and 3,515 (10.1%) cases, respectively. These three states constituted more than half of the infection numbers at the national total. If we include Madhya Pradesh (2,625, 7.5%), Rajasthan (2,584, 7.4%), Tamil Nadu (2,323, 6.7%), and Uttar Pradesh (2,211, 6.3%), which contribute more than

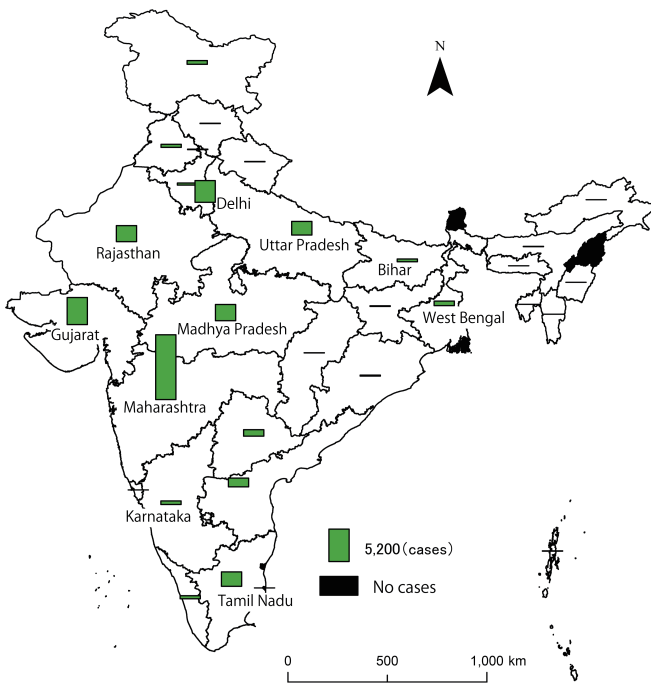


Figure 3. Number of new infections by state in January to April 2020

Source: Based on data from covid19india.org.

5% to the national total, 80.7% of the total number of new infections is explained. Thus, the number of new infections during this period tended to be concentrated in the western and northern states.

In contrast, in the eastern and southern states of India, only Tamil Nadu was notable. In addition, the number of new infections in states with large populations, such as Bihar (425, 1.2%), West Bengal (758, 2.2%), and Karnataka (565, 1.6%) was also low.

2. May

The number of new cases in May was 150,290, as shown in Figure 4. Infections were also confirmed in Nagaland, Sikkim, Dadra & Nagar Haveli, where there had been no cases before April, and the disease spread to all states except Daman & Diu and Lakshadweep.

In terms of the number of new infections by the state, Maharashtra had the highest number of new infections (57,157), which accounted for 38.0% of the national total and was higher than in the previous period, followed by Tamil Nadu and Delhi with 20,010 (13.3%) and 16,329 (10.9%) infections, respectively. It is noteworthy that the number of new infections in Tamil Nadu increased substantially, from 2,323 (6.7%) in April to nearly 10 times that in May. Consequently, Tamil Nadu had the second-highest number of new infections in India, surpassing the number in Delhi. Gujarat had the fourth-highest number of new infections at 12,399 (8.3%).

Besides these four, no other state reported more than

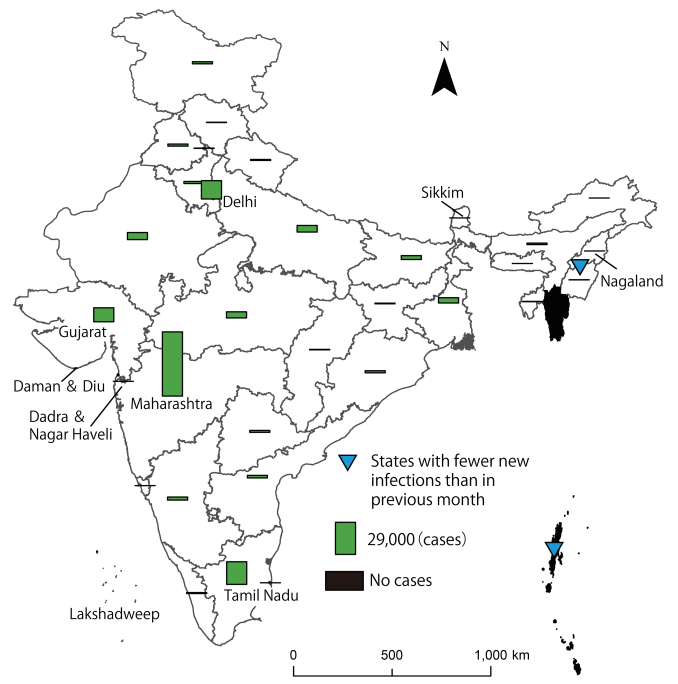


Figure 4. Number of new infections by state in May 2020

Source: Based on data from covid19india.org.

5% of the total number of new infections. The total number of new infections in those four states contributed to 70.5% of the national total. Thus, the large increase in the number of new infections in May tended to be concentrated in the top four states.

3. June

Figure 5 shows the number of new infections in each state in June. The total number of new infections was 393,531, which was more than double the number of new infections in May.

In terms of the number of new infections by the state, Maharashtra remained the highest, at 107,106. Maharashtra was followed by Delhi and Tamil Nadu, with their rank remaining unchanged from May. The number of new infections in Tamil Nadu and Delhi exceeded 60,000, with 67,834 and 67,516, respectively. The contribution to the national total of new infections was 17.2% in Tamil Nadu and 17.1% in Delhi, with Delhi's ratio expanding by 6.2% since May. Thus, the number of new infections in Delhi was almost equal to the number in Tamil Nadu, which was a distinctive feature of June.

Gujarat, which had the fourth-highest number of new infections in May, had 15,849 new infections in June. This state had the fourth-highest number of new infections in June, but the gap between Tamil Nadu and Delhi widened significantly compared to May. In addition, the number of new infections in May was 12,399; thus, the increase in the number of new infections was 3,450. Thus, Gujarat did

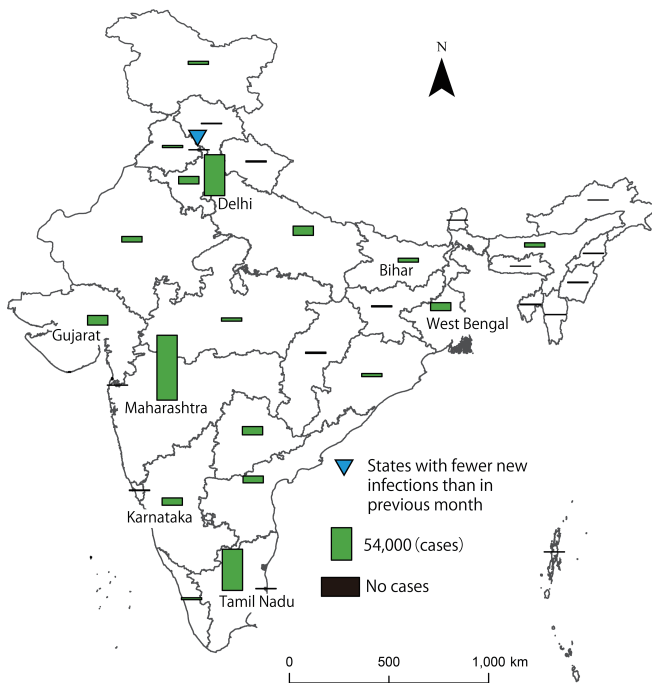


Figure 5. Number of new infections by state in June 2020
Source: Based on data from covid19india.org.

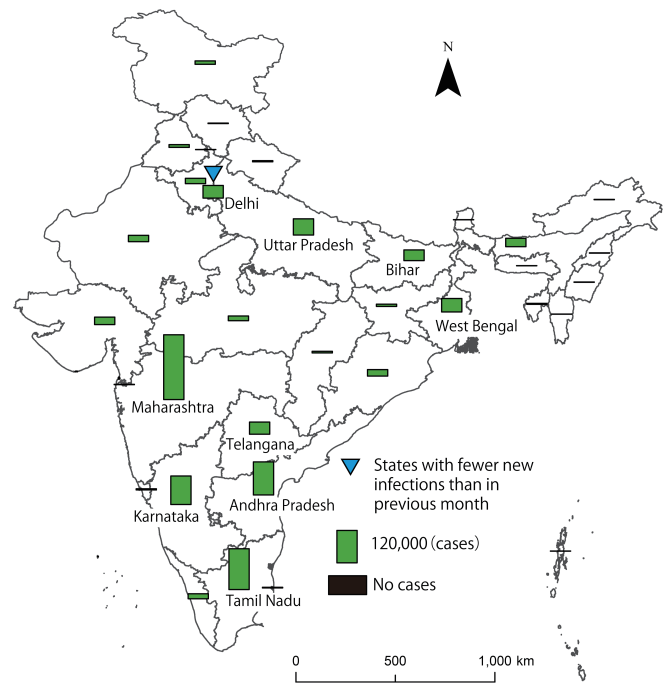


Figure 6. Number of new infections by state in July 2020
Source: Based on data from covid19india.org.

not experience a significant increase in the number of new infections, as in the above three states. Consequently, its national contribution to the number of new infections was halved from 8.3% to 4.0%.

In May, the top four states accounted for 70.5% of the total number of new infections in India, but this dropped to 65.6% in June, reflecting a decrease in Gujarat's contribution to the national proportion. The national proportion contribution for the top three states remained largely unchanged at 62.2% in May and 61.6% in June. In contrast, except for the three states of Maharashtra, Tamil Nadu, and Delhi, no other states exceeded 5%, the national proportion contribution of new infections in June. In Bihar, West Bengal, and Karnataka, the number of new infections in June was 6,181 (1.6%), 13,058 (3.3%), and 12,021 (3.1%), respectively. Although the number of new infections increased compared to May in these states, the number of infections was still low compared to the population size.

4. July

Figure 6 shows the number of new infections by the state in July. The total number of new infections was 1,118,277, which was almost three times the number of new infections in the previous month.

Maharashtra remained the most affected state, with 247,357 new cases. However, the national proportion of new infections continued to fall to 22.1%. The next three states with the highest number of new infections were

Tamil Nadu, Andhra Pradesh, and Karnataka. Tamil Nadu was among the top three states for new infections in May and June, and 155,692 new cases (13.9%) were confirmed during July.

The other two states did not have as many cases as in the previous month. The number of new infections in Andhra Pradesh increased from 11,024 (2.8%) in June to 126,338 (11.3%) in July, which is second only to Tamil Nadu in the number of new cases. Similarly, Karnataka witnessed a significant increase in the number of new infections from 12,021 (3.1%) in June to 108,873 (9.7%) in July. Thus, in July, some states with lower numbers of new infections experienced a marked increase in these numbers. Infections in other states, such as Uttar Pradesh, West Bengal, Telangana, and Bihar, also became more prominent but did not increase as much as in Andhra Pradesh and Karnataka.

The trend of new infections in Delhi is important. As mentioned, this state has been one of the main states of COVID-19 infections in India. However, in July, the number of new infections in Delhi began to decline, from 67,516 (17.1%) in June to 48,238 (4.3%) in July. In addition to Delhi, other states saw the number of new infections decrease compared to the previous month—all were states where the number of infections was already low (Figures 3, 4, 5). Hence, this trend is noteworthy in Delhi, as it indicated a new trend in the spatial pattern of COVID-19 infections.

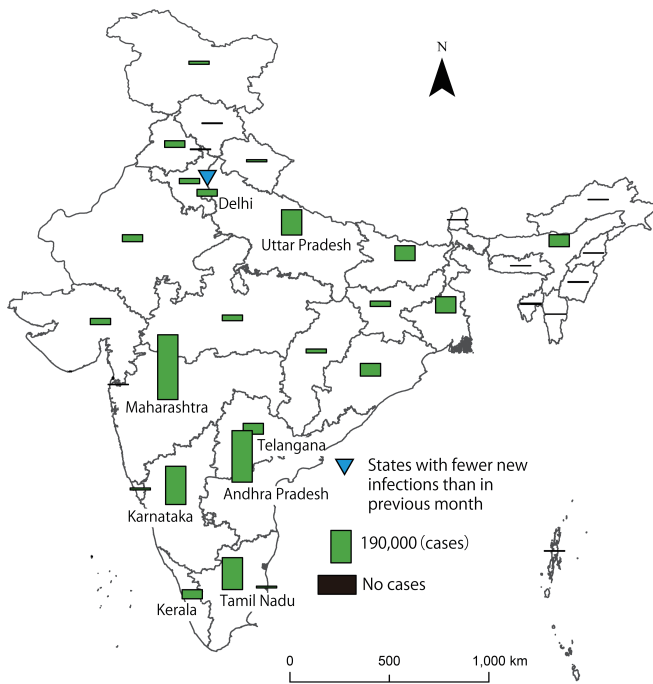


Figure 7. Number of new infections by state in August 2020
Source: Based on data from covid19india.org.

5. August

The total number of new infections in August was 1,990,350, an increase of 872,073 compared to the number of new infections in July.

As in previous months, Maharashtra had the highest number of new infections, in August with 370,423 (18.6%) (Figure 7). This was followed by Andhra Pradesh (293,838, 14.8%), Karnataka (218,308, 11.0%), and Tamil Nadu (182,182, 9.2%). These were increases of 167,500 in Andhra Pradesh and 109,435 in Karnataka, but only 26,490 in Tamil Nadu. This led to a change in the ranking of the top four infected states.

Uttar Pradesh, which had the second-highest number of new cases after Tamil Nadu, had 144,953 cases (7.3%) in August. The number of new infections in Telangana (61,750) and Kerala (51,771) also exceeded 50,000, which could not be ignored. In contrast, as in the previous month, Delhi witnessed a decline in the number of new infections. As mentioned earlier, the number of new infections in July was 48,238, while in August it was 39,150, a reduction of over 9,000 new infections. Due to these declines, the states' contribution to the national proportion of new infections dropped from 17.1% in June to 2.0% in August.

6. September

The number of new infections in September was 2,622,322, an increase of 631,972 over August (1,990,350). Although this was less than the increase in the number of

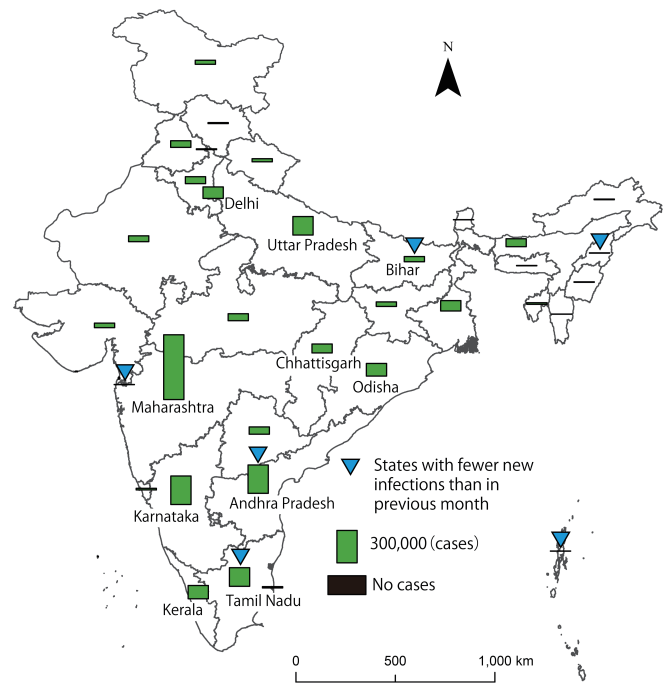


Figure 8. Number of new infections by state in September 2020
Source: Based on data from covid19india.org.

new infections from June to July (724,746) and from July to August (872,073), it was the highest number of new infections per month in 2020.

The highest number of new infections by the state was in Maharashtra, as in the previous months (Figure 8). After Maharashtra, Karnataka (259,344), Andhra Pradesh (258,713), and Tamil Nadu (258,713) had the highest number of new infections. However, the national proportion contributions from these three states were 9.9%, 9.9%, and 6.5%, respectively, lower than those in August. Furthermore, compared to the number of new infections in August, Karnataka saw an increase of 41,036, while Andhra Pradesh and Tamil Nadu saw a decrease of 35,125 and 12,621, respectively. These results suggest that the spread of disease in these three southern states, which was pronounced in July and August, began to slow down in September. Kerala, also located in the southern part of India, showed an increasing trend with 120,722 new cases (4.6%) in September—up from 68,951 in August.

While the number of new infections in Delhi declined in July and August, the number of new infections in September stood at 104,967 (4.0%), an increase of 65,817 from August. This is significantly higher than the number of new infections in June (67,516), indicating that the spread of infection was again increasing.

The number of new cases in Uttar Pradesh reached 168,668 (6.4%)—almost the same as in Tamil Nadu. Odisha saw an increase of over 40,000 from August's figures, with 115,583 new infections in September. In

contrast, Bihar saw a decline in the number of cases, with 46,569 new cases in September, down 38,781 from August's total. Chhattisgarh also showed an increasing trend in the number of new cases, with 82,099 new cases in September, an increase of 59,788 compared to August.

7. October

In October, 1,873,041 new infections were confirmed in India. Since the monthly peak of infection occurred in September, the number of new infections decreased by 749,281, indicating that the infection had subsided. Of the 34 states with infections in October,¹⁰ only seven states (Kerala, West Bengal, Delhi, Rajasthan, Manipur, Meghalaya, and Nagaland) had more new cases than in September (Figure 9).

The highest number of new infections occurred in Maharashtra, where 293,960 new cases were recorded in October. However, compared to September (591,905), the number of new infections was about half of the total, and the national proportion contribution dropped from 22.6% to 15.7%. Kerala had the second-highest number of new infections after Maharashtra, which reported 236,999 new cases (12.7%), an increase of 116,277 from the previous month. It is noteworthy that while the number of new infections in India had been declining, Kerala had seen an exceptionally large increase in the number of infections.

Kerala was followed by Karnataka, Andhra Pradesh, and Tamil Nadu, which had been the second most affected

state after Maharashtra since July. The number of new infections in October was 221,645 (11.8%), 129,864 (6.9%), and 126,920 (6.8%), respectively. In September, Andhra Pradesh and Tamil Nadu had already seen a decrease in the number of new infections, and in October, the number of new infections in Karnataka also began to decrease compared to September. Among them, the number of infections in Andhra Pradesh decreased remarkably, with the number of new infections almost halving from 258,713 in September to 129,864 in October.

These three states were followed by West Bengal and Delhi, with the highest number of new infections. Both are states where the number of new infections in October was higher than that in September. The number of new infections in October exceeded 100,000 in West Bengal (116,615, 6.2%) and Delhi (106,991, 5.7%). The increase in the number of new infections since September was 22,344 in West Bengal and 2,024 in Delhi. Conversely, the number of new infections in Uttar Pradesh in October was 82,781, a significant reduction after the spread of infection observed in August and September. Compared to the number of new infections in Uttar Pradesh in September, the number was halved to 85,887, indicating that the spread of the disease had slowed dramatically.

8. November

The total number of new infections in November was 1,279,861, a decrease of 593,180 compared to the number of new infections in October, indicating that the spread of infection continued to slow down. Similarly, of the 34 states with new confirms in November, nine states—Delhi, Rajasthan, Haryana, Gujarat, Himachal Pradesh, Chandigarh, Mizoram, and Sikkim—had more new cases than in October (Figure 10). The states with an increase in the number of new infections compared to October were predominantly distributed in northwestern India, which was a unique feature.

In terms of the number of new cases by the state, Delhi had the highest number of confirmed cases. Maharashtra consistently had the highest number of new infections, but November saw a change in the ranking. The number of new infections in Delhi in this month was 183,668 (14.4%), an increase of 76,677 from October. While there had been a nationwide trend of infections being more contained since October, they continued to increase significantly in Delhi.

After Delhi, Kerala (169,877, 13.3%), Maharashtra (145,490, 11.4%), and West Bengal (109,820, 8.6%) had the highest number of new infections—all four having more than 100,000 cases. As mentioned earlier, Kerala

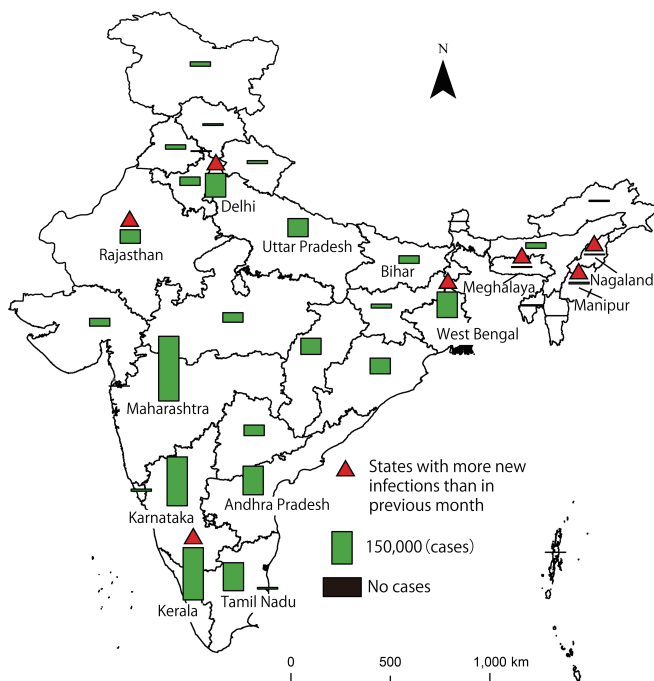


Figure 9. Number of new infections by state in October 2020

Source: Based on data from covid19india.org.

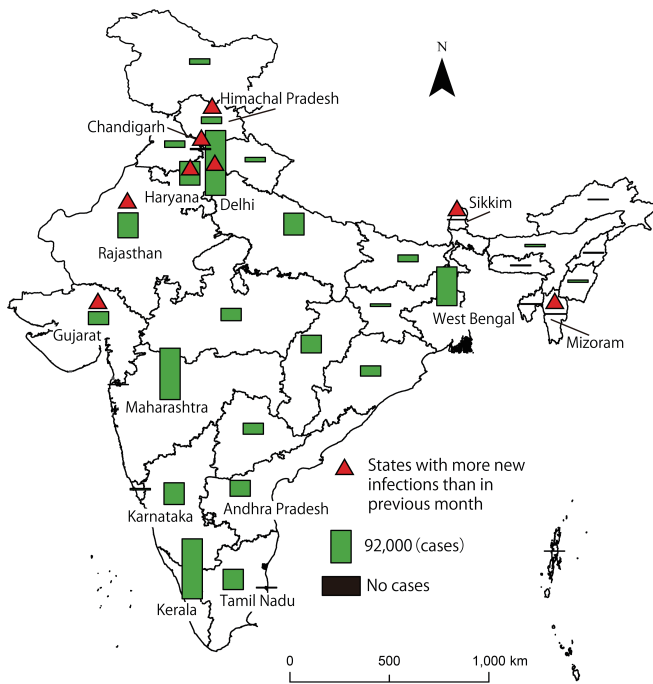


Figure 10. Number of new infections by state in November 2020

Source: Based on data from covid19india.org.

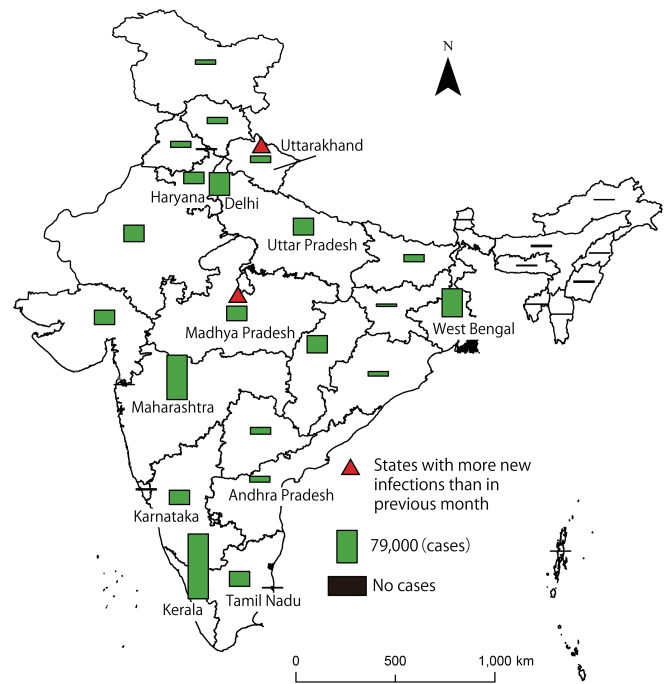


Figure 11. Number of new infections by state in December 2020

Source: Based on data from covid19india.org.

experienced a major outbreak in October, but the number of new infections in November was 67,122 fewer than in October. The number of new infections in Maharashtra, which had the highest number of infections until the previous month, had dropped by less than half with 148,470 fewer cases since October. The number of new infections in West Bengal decreased from October to 6,795, not as much as in the above two states.

The number of new cases in Karnataka, Tamil Nadu, and Andhra Pradesh, where the disease was spreading widely since July, was 61,485 (4.8%), 57,393 (4.5%), and 44,716 (3.5%), respectively. The significant reduction in the number of new infections in Karnataka (160,160), Tamil Nadu (69,527), and Andhra Pradesh (85,148) compared to October indicates further containment of the outbreaks.

In contrast, considering the states where the number of new infections increased compared to October, apart from Delhi, Rajasthan and Haryana stand out. In November, there were 71,070 new infections (5.6%) in Rajasthan and 66,916 (5.2%) in Haryana. The increase in new infections from October was 9,369 in Rajasthan and 28,305 in Haryana, the latter indicating a sharp increase.

9. December

Finally, the total number of new infections in December was 823,056. Compared to November, the number of cases decreased by 456,805, indicating that the infection

had a containment trend following October and November. Of the 34 states with infections in December, only Madhya Pradesh and Uttarakhand had more new infections than in November (Figure 11). The increase in the number of new infections was 894 in Madhya Pradesh and 3,658 in Uttarakhand.

The state with the highest number of new infections was Kerala, which witnessed a change in its ranking in November. The number of new infections in Kerala in December was 157,951 (19.2%), but there were 11,926 fewer infections than in November. Apart from Kerala, Maharashtra was the only state with more than 100,000 new cases. The number of new infections in this state was 108,216, a decrease of 37,274 in November.

In contrast, Delhi, where the number of infections increased significantly in November, reported 54,995 new infections (6.7%) in December. Compared to the number of new infections in November, this was a decrease of 128,673, indicating that the spread of the disease had subsided in December. Notably, the infection rate in Delhi showed large fluctuations by month.

In Haryana, where the infection rate was significantly high in November, as in Delhi, the number of new infections reached 28,199 in December. The number of infections had decreased by 38,717 in November, indicating that the spread of the disease had ended. Regarding the decreasing number of new cases in December mainly in the states with high caseloads up to November, West

Bengal reported 68,579 (41,241 decrease) new cases; Uttar Pradesh, 41,078 (20,947 decrease); Tamil Nadu, 36,099 (21,294 decrease); Karnataka, 34,599 (26,886 decrease); and Andhra Pradesh, 14,222 (30,494 decrease) cases.

As shown above, the number of new infections in most states declined in December. Even in those states where the number of new infections increased compared to November, the increase was limited and did not result in a major outbreak. Thus, December, unlike October and November, was a period of containment of the infection throughout India.

V. Conclusion

In this study, the regional characteristics of COVID-19 infection trends in India in 2020 were revealed through GIS mapping.

The monthly trend of COVID-19 infection by the state shows that Maharashtra, Gujarat, and Delhi accounted for most of the cases until April. In May, the pace of increase in the number of cases in Gujarat slowed down, and a large increase was seen in Tamil Nadu. This trend continued in June, but in July and August, there was a marked increase in the number of cases in Karnataka and Andhra Pradesh. The pace of increase in these two states slowed in September, and the number of new infections throughout India began to decline in October. Notwithstanding, the increase in Kerala, which had not seen many cases until September, became apparent; in December, it became the state with the highest number of new infections.

As described above, the trend of COVID-19 infections in India by the state showed certain regional characteristics for each month. The regional characteristics of COVID-19 infection trends are also related to infection trends throughout India. That is, from April to June, when the infection began to spread, Maharashtra, Gujarat, and Delhi were the main states with infections. In addition to Maharashtra, there was a marked increase in the number of infections in Karnataka and Andhra Pradesh in southern India during the period from July to September, when infections increased rapidly. After peaking in September, the number of new infections in India began to decline, but infections in Kerala became more prominent during this period. Conversely, the infection trends in Delhi were characterized by large monthly fluctuations in the number of infections.

In India, the second wave of infection spread after April 2021. Continued analysis of infection trends since January 2021, including the second wave, and examination of its regional characteristics is a future research issue.

Acknowledgments

This study used data from the website covid19india.org. We would like to thank everyone who collected and updated the data.

The contents of this study were presented at the Academic Meeting of the Association of Japanese Geographers in Autumn 2020, the Academic Meeting of the Japanese Society for Geographical Sciences in Autumn 2020, and the Academic Meeting of the Japanese Society for Geographical Sciences in Spring 2021.

This study is part of a project for the National Institutes for the Humanities (NIHU).

Notes

1. <https://ej.maps.arcgis.com/apps/dashboards/c3a8284f82c84542bdccd6e938ef9e8c> (accessed August 1, 2021).
2. However, India's mortality rate is 1.34%, which is lower than the global rate (2.13%). India has the lowest mortality rate among the top five countries in terms of total infections: it is 1.75% in the US, 2.79% in Brazil, 1.81% in France, and 2.52% in Russia.
3. The results of the study using countries other than India as a case study are reviewed in Ahasan et al. (2020), Franch-Pardo et al. (2020) and Fatima et al. (2021).
4. The district analysis was conducted in the case of Maharashtra and Karnataka.
5. This is a study based on the distribution of total infection as of April 27, 2020.
6. <https://www.covid19india.org/> (accessed August 1, 2021).
7. Data with state-level and district-level information are provided.
8. Because data were compiled into weekly numbers of infections, figures for January 1 and 2, 2021 are also included. Further, as there was only one case on January 30, we included it in the number of cases for the week of February 2 in Figure 2.
9. The months in which the total number of new infections does not match the figures in the whole of India data are May (5491 cases), June (1513 cases) and July (7004 cases).
10. In Daman & Diu and Lakshadweep, the data of infections is 0 in any month.

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