A Study of Trend Growth Rate of Confirmed Cases, Death Cases and Recovery Cases of Covid-19 in Union Territories of India

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Abstract
The limit of COVID-19 cases in India is growing at a fast rate. The Mortal and localized authorities are having a solid dimension to create a route, study and anticipate the distribute of COVID-19 in India. The principal aim of this article is to gain a statistical leader for healthier savvy of COVID-19 spreading in India by soundly studying the reportable cases in the country 10 June 2020 to 7th August 2020 of union territories in India. Regression Analysis is implemented to measure the growth rate. The study revealed that India's confirmed cases of COVID-19, death and recovery from covid-19 is increasing for the study period. The growth rate of recovery from COVID-19 is increasing, which clarify that the management of federal system of India is working effectively and efficiently.
Keywords: COVID-19, COVID-19 analysis India; Regression, data analysis, analytical data analysis technique
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1. Introduction

Coronavirus (COVID-19) is a new type of Coronavirus that causes an infectious respiratory disease. It was first explored in Wuhan, China, by Stoecklin.et.al (2020). COVID-19 was initially described in Taiwan in November of this year. COVID-19 has now spread over more than 200 countries, affecting over 1,400,000 people and killing over 85,000. People all across the world have chastised China for its lack of clarity and delays in getting the disease. COVID-19 is causing havoc on all of these people's life as well as the systems of many countries throughout the world. The virus known as SARS-CoV-2 causes COVID-19, which short for coronavirus illness 2019. When it comes to this virus, both the COVID-19 virus and indeed the virus that causes COVID-19 are beneficial. However, because COVID-19 refers to the illness's family rather than the virus, it is incorrect to refer to the new virus as COVID-19.

COVID-19 was originally detected as a lower respiratory infection in Wuhan, China, in December 2019 [1]. Symptoms include fever, chills, dry cough, exhaustion, and breathing difficulty. This unusual cause of pneumonia has rendered the entire world unable to function, resulting in disastrous safety and increased losses. The novel coronavirus is related to SARS and MERS-CoV, although the former's impact is more devastating, as seen by the overall rise in infect cases [2]. COVID-19 has an incubation period of 1–14 days, with a mean of 6 days [1], during which untreated virus drivers can spread the disease to healthy persons by droplets or touch, as evidenced by past human transfer via droplets or contact [3]. According to the World Health Organization's International Health Regulations (2005), COVID-19 was declared a Public Health Emergency of Worldwide Concern by the end of January. The world has gone into virtual lockdown as a result of the virus's unprecedented

spread, with numerous countries instituting tight screening of possible cases coming into their territory [5].

By performing literature studies and obtaining information from publications, media reports, and other publicly available documents to contextualise pertinent information, we analyse the health, social, geopolitical, and economic impact of COVID-19 in India. The research is part of a retrospective analysis on different countries' initial experiences with the COVID-19 epidemic.

2. Literature Survey

On the seventh of January 2020, the China CDC released a virus known as new coronavirus 2019 (2019-nCoV), also known as the "City coronavirus." The WHO dubbed it SARS-CoV-2 in order to de-stigmatize the virus's current status by associating it with any regional activity or position and connecting it to the symptomatology of this illness. This SARS-CoV-2 virus is genetically related to the 2002 SARS Coronavirus (SARS-CoV-1). This dreadful condition is shared by a slew of incompatible coronaviruses. These adenoviruses become infective when they come into contact with the beast provide, which provides a competent cancellate habitat in which the virus may replicate and amend a variety of beneficial genetic variations. After that, there is a change as a result of these variations.

The Arabian Sea, the Bay of Bengal, the Indian Ocean to the south, and the Himalayan, which isolates India from the Asian mainland, form the boundaries of the Indian peninsula. The Himalaya influences India's major climatic conditions, and the monsoons generate a tropical climate with hot and humid summer temperatures [6].

India's population has surpassed 1.3 billion people and continues to rise. India has a positive growth rate, with a documented birth rate of 20.2 per 1000 inhabitants and a mortality rate of 6.3 per 1000 people. Over half of India's population is under 30 years old. Life expectancy has risen steadily in recent decades, reaching 67.4 years for males and 70.2 years for women in 2016. In 2017, India's infant mortality rate was 33 per 1000 live births; mortality rates in rural areas were higher than in urban ones [6].

India is placed as a federal republic with various states and union territories (UT). A constitution issued in 1949 governs the country, which is ruled by a multi-party parliamentary democracy. Municipal authorities have the authority to legislate in the areas of law and public health due to the federal power divide between the union and the states [7]. The government of India recognises 22 languages for state-official communication, demonstrating the country's multi-ethnicity. Hinduism is practised by over 80% of the Indian population. Muslim (14 percent), Christian (2.3 percent), Sikh (1.7 percent), and others/unspecified (2 percent) are the other religious groupings [7]. From the Sgds (SDG) India Index Report 2019, India's diversity results in a wide range of disparities, including "[..] inequalities in income and consumption; structural inequalities based on gender, religion, caste, and social groups, as well as regional inequalities, all of which manifest in unfairnesses of levels of access" [8]. (p. 131).

India is one of the second strongest economies, with a growth rate of 6.8% in 2018–2019. In 2018, India's GDP was estimated at US$2.72 trillion, with a per head income of US$2015. In terms of poverty reduction, the number of persons living below the World Bank's Worldwide Poverty Line fell from 21.2 percent in 2011 to 13.4% in 2015. Despite its economic progress, India's unemployment rate is higher than the world average, with rural (5.3%) and urban (7.8%) areas [8,9].

According to the Human Development Report 2019, India has an HDI score of 0.647, placing 129th out of 189 countries [8]. This places the country in the middling human welfare category.

According to the federal system, the Indian healthcare system is split between the Union government and state governments [10]. The Union Ministry of Health and Family Welfare is in charge of implementing initiatives that can eventually be adopted by the government, while the state government is in charge of the state's public health system. The federal and the state governments work together to provide national health quality and control [10]. Primary, secondary, and tertiary level health centres make up the health care infrastructure. For illness promoting health, primary-level health centres contain sub-centers for underprivileged populations, rural, and urban areas [10]. Primary health centres are a significant priority of the 2017 National Health Policy, with two-thirds of funding allocated to their construction and maintenance as the initial point of contact with individuals [11]. Community health centres for medical specialisations, surgeries, and radiological equipment are examples of secondary-level health centres. University and district hospitals make up tertiary-level health centres, which provide specialist medical services. In India, private health facilities are mostly secondary and tertiary level [10]. Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy, commonly known as AYUSH, are part of India's formal healthcare systems, which is overseen by the Ministry of AYUSH [12]. Registered physicians of AYUSH are recognised as qualified healthcare experts [13]. AYUSH deals with herbal, ergonomic, and traditional pharmaceutics remedies for diseases.

India obtained a "CCC" overall rating and was ranked ninth out of nine countries in the Laura Miller ranking system, indicating that its health system requires significant improvement [14]. Furthermore, since 2006, the Indian government has consistently spent only 3.5 percent of its overall gross domestic product (GDP) on health. This amount is roughly half of WHO member states' overall global GDP spent on health systems, as well as the average current health spending by BRICS nations, both of which are 6.3 percent. [15] (see Appendix A). However, according to the Central Bureau of Health Intelligence's National Health Profile, the government's public expenditure (GPE) for health accounts for only 1.28 percent of total government revenue, indicating that private health expenditure including out payment are extremely high [6].

According to the Economic Survey, Ministry of Statistic and Program Implementation 2013–2014 [16], OOP accounts for about 65 percent of overall health expenditure in India. According to the WHO's Universal Health Coverage Global Monitoring Report [17], Indians spend approximately 80% of their monthly income on drugs. Long-term hospitalisation necessitates the borrowing of assets and/or the use of income savings to cover treatment costs, resulting in the patients' destitution. To address this problem, the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB PM-JAY) was introduced in 2018, covering 40% of India's poorest people and is one of the world's largest health-care insurance systems, with the goal of achieving universal health coverage [18]. There are 35 doctors, nurses, and midwives per 10,000 people, and one allopathic public doctor per 10,000 people, which is a big concern [6,19]. Users are more likely to visit private medical centers than governmental health facilities because private providers give better health care and quality. Furthermore, private health institutions create a monopoly in rural areas, where people pay more for services than they do in metropolitan areas [20]. Gender parity is important, as male patients pay about $100 more than female patients due to demographic, economical, and discriminatory factors

[21]. According to OECD data, India has 0.5 beds per 1000 people, compared to China's 4.3 beds per 1000 people [22].

Regression Analysis is used to calculate the growth rate of India's effective cases of COVID-19, death, and recovery from COVID-19 on datasets damaged from various sources such as "Ministry of Energetic and tribe Eudaemonia" [9], "COVID-19 India website" [10], "Evangel Billionaire GitHub sepulture" [11], "Worldometer" [13], and "Wikipedia" [14] using "Excel" and thus analysing The dataset that employs regression goes through the regression process, as well as the selection of critical columns via filtering and the explanation of new columns. This wadding used "Statistical tools in Excel" for "information processing" and "web scraping," as well as a "excel" database to traverse through and collect data from the winnable dataset. Mittal (2020) has also carried out COVID-19 data analysis in India.

2.1 COVID-19 Spread in India over time

Inveterate, beplastered, deaths, and recovered cases are condemned from 22 January 2020 exchequer 8 Lordly 2020, according to Mittal's information. Representing the number of people who have lost their limbs, perpendicular numerate 1 portrays "Recovered," which depicts the number of people who have rebounded, and architectural number 2 displays "Athletic" cases, the number of Fatalities, and Recovered from Common cases.

India announced the country's first case of COVID-19 in Kerala on January 30, 2020. The index case was a student who was isolated in a hospital after returning from Wuhan. As of 3 February, three cases had been verified in Kerala, all of which originated in various spots. They were officially recovered on February 20th [27]. Little information was given about the first COVID-19 cases in India, thus it's unclear whether they will be contacts of the first case or had any travel history. However, after a month, the number of cases began to rise, and by the beginning of March, more states and union territories had been affected (c.f. Appendix B). COVID-19 prevalence is mostly linked to travel and local transmission of imported cases, per the Ministry of Health and Family Services. Limited community dissemination was initially recorded on March 30 [20]. Klein et al., on the other hand, believe that community transmission in India began around the congress in March [2]. India reported its first two COVID-19-related deaths on March 14th. As a result, both clients were above the age of 65 and had comorbidities [27]. India's case-fatality ration (CFR) stayed consistent at 3.2 percent for most of the first weeks after the instances till mid-May. CFR had reduced to 2.8 percent by 0.6 deaths per 100,000 people as of June 9th. India's CFR is similar to the Asian Region Region's combined CFR [27].

There was a scarcity of segmented data. However, 76 percent of confirmed cases were male, according to a news statement issued by the Ministry of Health Welfare on April 6. The known cases were divided into three age groups: 47 percent were under 40 years old, 34 percent were between 40 and 60 years old, and 19 percent were 60 years or older. Furthermore, separated mortality data was presented: males accounted for 73% of all fatalities (27 percent female). Despite the fact that elderly individuals account for only 19% of illnesses, they account for 63 percent of recorded deaths. Thirty percent were between the ages of 40 and 60, while seven percent were under the age of 40. Furthermore, 86 percent of those who died had comorbidities [3].

3. Research Methodology

3.1 Rationale of the Study

As we have seen through reviews and various news mediums that the COVID-19 cases are increasing in our country as well as in the world. All the governments are engaged in the fighting with COVID-19. It has a huge impact on all aspects of human being. Initially it has created a deep fear into the people. In a very few months Indian government has developed well system in the country to fight against COVID-19. These arrangements are really amazing and set an example for all the systems. The number of cases is still increasing in country. The study will provide the guideline to the government about growth of confirmed COVID-19 cases, death due to COVID-19 and recover from the COVID-19. With the help of the results government can prepare a policy to control it. Study will also provide a guide line to the pharmaceutical companies and medical practitioner about its attributes related to our study.
study.

3.2 Objectives of the Study

1) To study the trend of confirmed cases of COVID-19 in union territories.
2) To analyse trend of deaths due to COVID-19 in union territories.
3) To analyse trend of recovery from COVID-19 in union territories.

3.3 Hypotheses of the Study

1) The number of confirmed cases of COVID-19 is increasing with respect to time in union territories.
2) The number of deaths due to COVID-19 is increasing over the study period in union territories.
3) The number of recovery cases from COVID-19 is increasing for the study period in union territories.

3.4 Methodology

This research applied descriptive and analytical study to do the analysis. There are 28 states and 8 union territories in India. The researchers want to do the study of top five states of India according to the confirmed cases of COVID-19. To know the top five states, average is used for the period 10th June 2020 to 7th August 2020. Observation claims that the number of confirmed cases, deaths and recovery from COVID-19 is increasing over the period. So there is a functional relationship exist between time and number of confirmed cases, deaths and recovery from COVID-19. The study is completely based on the secondary data source. The related data have been collected from [26].
Growth Rate of number of confirmed cases, deaths and recovery from COVID-19:
To measure the growth rate of number of confirmed cases, deaths and recovery from COVID-19 [28], semi-log function has been employed for the study period 10th June 2020 to 7th August 2020. The growth is calculated by using following formula.

3.5 Growth Rate of number of confirmed cases, deaths and recovered from COVID-19:

To measure the growth rate of number of confirmed cases, deaths and recovered cases from COVID-19, semi-log function has been employed for the study period 10th June 2020 to 7th August 2020. The growth is calculated by using the following formula.

$$\log Y_t = \beta_1 + \beta_2 T + U_t$$

Here Y_t is Dependent Variable (confirmed cases, deaths and recovered cases from COVID-19).

T = Time Period

β_1 & β_2 = Regression Coefficients

U_t = Residual

The growth rate is calculated by the estimate of $\beta_2$parameter. To calculate the compound growth rate following formula is used.

Compound Growth Rate = (Antilog β_2 - 1)*100

Average Formula:

$$\text{Average} = \frac{\sum_{i=1}^{n} x_i}{n}$$

Where n is the total number of observations.
Sample Size: 59 days: 10th June 2020 to 7th August 2020.

4. Results and Discussion

The table 4.1 shows that the average of confirmed COVID-19 cases of all states of India and union territories. It is clear from the table that mean of confirmed cases maximum for Maharashtra that is 253526 people and minimum for Andaman and Nicobar Islands (243 persons). Therefore, it is interesting to do the study of COVID-19 in union territories.

Table no. 4.1: Mean of Confirmed Cases COVID-19

Sr. No.	State and Union territory	Mean
1	Maharashtra	253526
2	Tamil Nadu	137804
3	Delhi	98324
4	Andhra Pradesh	51993
5	Karnataka	51304
6	Uttar Pradesh	42679
7	Gujarat	41512
8	West Bengal	35271
9	Telangana	32513
10	Rajasthan	25446
11	Bihar	23059
12	Haryana	20844
13	Madhya Pradesh	19487
14	Assam	18933
15	Odisha	15126
16	Jammu and Kashmir	11582
17	Kerala	10604

18	Punjab	8812
19	Jharkhand	5206
20	Chhattisgarh	4684
21	Uttarakhand	4099
22	Goa	2858
23	Tripura	2511
24	Manipur	1585
25	Pondicherry	1584
26	Himachal Pradesh	1394
27	Ladakh	1033
28	Nagaland	866
29	Chandigarh	639
30	Arunachal Pradesh	618
31	Dadra and Nagar Haveli and Daman and Diu	512
32	Meghalaya	326
33	Sikkim	269
34	Mizoram	251
35	Andaman and Nicobar Islands	243
36	Lakshadweep	0

Table taken from [22]

Table no. 4.2: Number of confirmed cases in Union Territories

SNo	Observation Date	Andaman and Nicobar Islands	Chandigarh	Dadra & Nagar Haveli and Daman & Diu	Delhi	Jammu and Kashmir	Pondicherry	Total UT
1	6/10/2020	33	323	30	31309	4346	127	36168
2	6/19/2020	45	381	68	53116	5680	286	59576
3	6/29/2020	90	435	213	85161	7237	619	93755
4	7/9/2020	151	523	459	107051	9501	1151	118836
5	7/19/2020	203	717	684	122793	13899	1999	140295
6	7/29/2020	363	978	1064	133310	19419	3177	158311
7	8/7/2020	1222	1374	NA	142723	23927	4862	174108

It is clear from the table no. 4.2 that the number of confirmed cases is increasing in all the union territories. The Delhi and Jammu & Kashmir showing the greater number of confirmed cases among the union territories. The highest average is noted for Delhi (98323.59 persons), then Jammu and Kashmir (11582.17 persons) Pondicherry (1584.14 persons), Chandigarh (638.51 persons), Andaman and Nicobar Islands (242.51 persons). The data of total of union territory is also showing the

increasing numbers of confirmed cases. So, it is worthwhile to calculate the growth rate of confirmed cases in union territories.

Table 4.3: Linear Trend Equation Estimate and Growth Rate of confirmed cases of union territories and Total of union territories

S no.	UT Name	Time period	Intercept β_1	Time β_2	R^2	Growth rate
1	Total of union territories	10 June 2020 to 7 August 2020	4.69 (0.02) (303.58)	0.01 (0.00) (24.43)	0.91	2.55
2	Andaman and Nicobar Islands	10 June 2020 to 7 August 2020	1.43 (0.02) (63.52)	0.02 (0.00) (37.74)	0.96	5.82
3	Chandigarh	10 June 2020 to 7 August 2020	2.45 (0.00) (268.99)	0.01 (0.00) (39.41)	0.96	2.43
4	Dadar Nagar Haveli	Data not available				
5	Dadra and Nagar Haveli and Daman and Diu	10 June 2020 to 7 August 2020	1.63 (0.03) (0.02)	0.02 (0.00) (32.98)	0.95	6.97
6	Delhi	10 June 2020 to 7 August 2020	4.65 (0.02) (252.76)	0.01 (0.00) (19..19)	0.87	2.39
7	Jammu and Kashmir	10 June 2020 to 7 August 2020	3.61 (0.00) (782.26)	0.01 (0.00) (98.61)	0.99	3.08
8	Lakshadweep	Data not available				
9	Pondicherry	10 June 2020 to 7 August 2020	2.22 (0.02) (142.36)	0.03 (0.00) (58.15)	0.98	6.23

- Values in parenthesis are standard error and t-statistics respectively
- t-statistics is significant at 5 percent level of significance

It is clear from the table no. 4.3 that the growth rate of confirmed COVID-19 cases is significant in all the union territories and total of union territories. The highest growth rate is noticed for Dadra & Nagar Haveli and Daman & Diu (6.97 per cent), 6.23 per cent, 5.82 per cent, 3.08 per cent, 2.43 per cent and 2.39 per cent growth rate is noticed for Pondicherry, Andaman and Nicobar Islands, Jammu & Kashmir, Chandigarh and Delhi respectively. The growth rate of confirmed cases of COVID-19 for total of union territory is 2.55 per cent. The Delhi and Jammu & Kashmir showing the low growth rate but the data of confirmed COVID-19 cases are greater among the union territories. The hypothesis of the study is accepted and revealed that over the study period the confirmed cases of COVID-19 increasing.

Table 4.4: Number of death cases in union territories

S. No	Observation Date	Andaman and Nicobar Islands	Chandigarh	Dadra and Nagar Haveli and Daman and Diu	Delhi	Jammu and Kashmir	Pondicherry	Total of UT
1	6/10/2020	0	5	0	905	48	0	958
2	6/19/2020	0	6	0	2035	75	7	2123
3	6/29/2020	0	6	0	2680	95	10	2791
4	7/9/2020	0	7	0	3258	154	14	3433
5	7/19/2020	0	12	2	3628	244	28	3914
6	7/29/2020	1	14	2	3907	348	47	4319
7	8/7/2020	19	23	NA	4082	449	75	4648

The table 4.4 shows that the number of death cases is increasing in union territories and also total of union territory. The death cases are highest in Delhi and Jammu & Kashmir. The Andaman & Nicobar Islands and Dadra & Nagar Haveli & Daman and Diu having zero cases or lowest cases among union territory. The highest average of death cases is noted for Delhi (3008.27 death cases), then Jammu and Kashmir (193.71 death cases), Pondicherry (23.08 death cases), Chandigarh (9.73 death cases), Andaman and Nicobar Islands (1.63 death cases). It is interesting to calculate the growth rate of death cases in union territories.

Table 4.5: Growth rate of death cases in union territories and Total of union territories

S no.	UT Name	Time period	Intercept β_1	Time β_2	R^2	Growth rate
1	Total of union territories	10 June 2020 to 7 August 2020	3.20 (0.02) (178.02)	0.00 (0.00) (17.69)	0.85	2.15

2	Andaman and Nicobar Islands	27July 2020 to 7 August 2020	(-0.15) (0.09) (-1.69)	0.13 (0.01) (10.69)	0.92	35.55
3	Chandigarh	10 June 2020 to 7 August 2020	0.61 (0.02) (36.47)	0.01 (0.000) (22.68)	0.9	2.57
4	Dadar Nagar Haveli	Data not available				
5	Dadra and Nagar Haveli and Daman and Diu	12 July 2020 to 7 August 2020	0.17 (0.03) (5.06)	0.00 (0.00) (3.29)	0.31	1.64
6	Delhi	10 June 2020 to 7 August 2020	3.19 (0.02) (165.58)	0.00 (0.00) (15.42)	0.81	2
7	Jammu and Kashmir	10 June 2020 to 7 August 2020	1.68 (0.00) (314.29)	0.02 (0.00) (110.72)	0.99	4.03
8	Lakshadweep	Data not available				
9	Pondicherry	11 June 2020 to 7 August 2020	0.52 (0.03) (20.89)	0.02 (0.00) (31.03)	0.95	5.48

- Values in parenthesis are standard error and t-statistics respectively
- t-statistics is significant at 5 percent level of significance

It is clear from the table 4.5 that the death cases due to COVID-19 are increasing in union territories. The maximum number of death cases due to COVID-19 is noted in Delhi and Jammu & Kashmir and its growth rate is 2 per cent and 4.03 per cent respectively. The highest growth rate is noticed for Andaman and Nicobar Islands and lowest for Dadra and Nagar Haveli and Daman and Diu. The hypothesis of the study is accepted and revealed that over the study period the growth rate of death due to COVID-19 increasing.

Table 4.6: Number of recover cases in union territories								
S No	Observation Date	Andaman and Nicobar Islands	Chandigarh	Dadra and Nagar Haveli and Daman and Diu	Delhi	Jammu and Kashmir	Pondicherry	Total
1	6/10/2020	33	286	2	11861	1506	52	13740
2	6/19/2020	35	315	26	23569	3194	118	27257
3	6/29/2020	46	349	82	56235	4585	221	61518
4	7/9/2020	83	403	211	82226	5695	584	89202
5	7/19/2020	145	488	448	103134	7811	1154	113180
6	7/29/2020	196	611	668	118633	11322	1874	133304
7	8/7/2020	425	820	NA	128232	16218	2914	148609

The number of recovered cases from COVID-19 is also increasing; it is clear from table 4.6. The average of recovered cases from COVID-19 is highest for Delhi (75677.51 recovered cases) then, Jammu and Kashmir (6784.19 recovered cases), Pondicherry (887.37 recovered cases), Chandigarh (450.58 recovered cases), Dadra and Nagar Haveli and Daman and Diu (299.53 recovered cases) and Andaman & Nicobar Islands (116.49recovered cases). It is worthwhile to calculate the growth rate of recovered cases.

	Table 4.7: Growth rate of recovered cases in union territories and total of union territories						
S no.	UT Name	Time period	Intercept β_1	Time β_2	R^2	Growth rate	
1	Total of union territories	10June 2020 to 7 August 2020	4.33 (0.03) (153.13)	0.02 (0.00) (20.69)	0.88	3.98	
2	Andaman and Nicobar Islands	10June 2020 to 7 August 2020	1.36 (0.01) (96.76)	0.02 (0.00) (47.39)	0.98	4.55	3
3	Chandigarh	10June 2020 to 7 August 2020	2.40 (0.00) (423.32)	0.00 (0.00) (45.83)	0.97	1.75	6
4	Dadar Nagar Haveli	Data not available					

5	Dadra and Nagar Haveli and Daman and Diu	10June 2020 to 6 August 2020	0.80 (0.06) (12.63)	0.04 (0.00) (23.24)	0.91	10.53	1
6	Delhi	10June 2020 to 7 August 2020	4.28 (0.03) (135.62)	0.02 (0.00) (18.73)	0.86	4.02	4
7	Jammu and Kashmir	10June 2020 to 7 August 2020	3.31 (0.01) (305.28)	0.01 (0.00) (46.98)	0.97	3.47	5
8	Lakshadweep	Data not available					
9	Pondicherry	10June 2020 to 7 August 2020	1.78 (0.01) (126.95)	0.03 (0.00) (74.30)	0.99	7.21	2

- Values in parenthesis are standard error and t-statistics respectively
- t-statistics is significant at 5 percent level of significance

The table 4.7 shows that the highest growth rate is recorded for Dadra & Nagar Haveli and Daman & Diu (10.53 per cent), Pondicherry 7.21 per cent, Andaman and Nicobar Islands 4.55 per cent, Delhi 4.02 per cent, Jammu and Kashmir 3.47 per cent, Chandigarh 1.75 per cent. The hypothesis of the study is accepted and advocates that over the study period the growth rate of recovered of COVID-19 increasing.

5. Conclusion and Future work:

The average of number of COVID-19 cases is highest for Delhi (98323.59 persons) and lowest for Andaman and Nicobar Islands (242.51 persons). The study concludes that the number of cases of COVID-19 is increasing over the study period. This period was the high spreading time, because no one has the greater idea about the COVID-19 virus. At that time there was no vaccine to cure it due to that the death cases were higher in that period. The average of death cases due to COVID-19 is highest for Delhi (3008.27 death cases) and lowest for Andaman and Nicobar Islands (1.63 death cases). The analysis revealed that the deaths are increasing due to COVID-19. The average of recovered cases from COVID-19 is highest for Delhi (75677.51 recovered cases) and lowest for Andaman & Nicobar Islands (116.49recovered cases). The recovered cases from COVID-19 are also increasing, the main reason behind is that the government provide the medical facilities to the infected persons.

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