# Comparison of Percent Positivity of Two Districts of Kashmir during the 3rd COVID Wave

## Jalila Qayoom [a#], Omar Rashid [a#], Talat Masoodi [a†*], Umar R. Khan [a#] and Syed Arshi [b‡]

[a] *SKIMS Medical College & Hospital Bemina, Srinagar, Jammu & Kashmir, India.*
[b] *Department of Microbiology, SKIMS Medical College & Hospital Bemina, Srinagar, Jammu & Kashmir, India.*

***Authors' contributions***

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

*Original Research Article*

## ABSTRACT

**Background:** SARS CoV-2 virus is the infectious agent that causes COVID-19 infection. The majority of those who contract this virus experience mild to moderate respiratory illnesses. This infection affected the entire population of India. The infection ratio (IR) of COVID-19 can be calculated by comparing the % positivity of various districts in a State/UT, which may prove crucial for developing policies and in taking necessary interventions for future.
**Objective:** The present study aimed to investigate the district level variation of COVID-19 infection in Kashmir during December 2021 and January 2022. The present study also gives the percent positivity of the COVID-19 infection at the various district levels.
**Data and Methods:** This study was retrospective in nature. The data was collected from COVID-19 lab of SKIMS Medical college and hospital (SKIMS MCH), Bemina and analysed.
**Results:** The total samples received in the month of December 2021 and January 2022 during 3rd COVID-19 wave from 2 districts in SKIMS MCH, Bemina,Srinagar was 56279. Out of these samples, 34141 was from district Kupwara and 22138 was from district Srinagar. The percent positivity for both months of December and January was more in district Srinagar i.e 11.4% and

[#] *Senior Residents;*
[†] *Assistant Professor;*
[‡] *Head of the Dept.*
*Corresponding author: E-mail: talatmasoodi@yahoo.co.in;*

3.8% respectively as compared to district Kupwara which was 8.7% and 2.9% respectively. From district Srinagar, the samples were received from 4 different regions i.e, Batmaloo, Tourist reception centre (TRC), SR gunj and Khanyar.The percent positivity in the month of December 2021 for various regions from district Srinagar i.e, Batmaloo, TRC, SR gunj and Khanyar was 4.1%, 5.2%, 2.9% and2.8% respectively. The percent positivity in the month of January 2022 for various regions from district Srinagar i.e, Batmaloo, TRC, SR gunj and Khanyar was 12.6%, 21%, 7.9% and 8.0% respectively.

**Conclusion:** The district Srinagar showed more cases of COVID-19 infection as compared to district Kupwara. This study provided the crucial information for the policies discourse and giving special attention to the vulnerability of the highly urban area.

## 1. INTRODUCTION

**"**COVID-19 is a respiratory disease caused by SARS-COV-2 virus, which belongs to a large family of the viruses known as Coronaviruses. This virus is thought to spread through droplets from person to person, when an infected person sneezes, talks or coughs" [1]. "In terms of the total number of infected patients of COVID-19, India has ranked second globally" [2]. "In the initial three months from January to March 2020, the rate of spread of the disease was slow, possibly because of the early nation wide lock down", [3,4,5] "the travel protocols and the quarantine facilities made by the union and the state governments" [6,7]. "Since April 2020,there was a rapid increase in the number of confirmed COVID-19 cases in many districts of Kashmir. Over 50,000 of cases were recorded every day in India from August 2020.In September-October 2020,after reaching a peak of COVID-19 infection, the new cases have been steadily declining in india. Globally, India has recorded a relatively high recovery rate and the lowest fatality rate" [8]. "India may have to undergo a higher burden of disease due to other demographic factors, despite of having a young age structure with less susceptibility to COVID-19 related deaths" [9,10]. "The demographic factors includes the enormous population size, high population density, higher percentage of people living in poverty, lower levels of per capita public health infrastructures and high prevalence of co-mormid situations" [11].

"There are research evidences that the increase risk of the transmission of second wave of COVID-19 is almost double of the first peak" [12]. "Many of the factors are responsible for making the second wave of COVID-19 more devastating, such as effect of testing rate, healthcare infrastructure and transmission rate" [13]. "COVID-19 infection has widely varied among the different states of the country, like any other demographic and health indicators" [14,15]. It is observed that the COVID-19 has been spreading rapidly in the densely populated urban states of the country like: Delhi, West Bengal, Maharashtra and Tamil Nadu. By using the demographic information and infrastructure characteristics, some of the recent studies have computed the composite indices to rank the districts in terms of their COVID-19 vulnerabilities,[16,17,18] which will decrease as the districts socioeconomic indicators improve.

It has been seen that the COVID-19 is more prevalent in cities and towns than in rural areas or the hilly regions [19]. Hence, it is important to compare the relationship patterns between the household infrastructural characteristics, district's socioeconomic status and the COVID-19 infection ratio.

The aim of the present study is to find out the district level variation in COVID-19 during December 2021 and January 2022 and to investigate the percent positivity of COVID-19 infection ratio in Kashmir at district levels.The identification and the percent positivity is helpful in giving the proper interventions and framing the health policies.

## 2. METHODS

The nature of this investigation was retrospective. The data was collected from COVID-19 lab of SKIMS Medical college and hospital(SKIMS MCH), Bemina and analysed. The total samples received in the month of December 2021 and January 2022 during 3rd COVID-19 wave from 2 districts in SKIMS MCH, Bemina, Srinagar was 56279.

## 3. RESULTS

The new cases of the Coronavirus has been seen every day in India since March 14, 2020.

Over 8.1 million confirmed cases are reported as of October 31, 2020 in India. Out of these, 122,154 were fatal and around 7.4 million patients recovered [20]. During the study period, the COVID-19 cases were peak in 15th December 2021 to January2022, and then it started declining. The total number of samples received during this period is mentioned in table 1.The percent positivity of district Kupwara and district Srinagar in the month of December 2021 January 2022, is shown in table 2. It also presented District level variations in COVID-19 from 1st December 2021 and 31st January, 2022, which is shown in table 3 and table 4. Of all districts,TRC has the highest number of cases with percent positivity of 21% by the end of January 2022 and Khanyar has the lowest number of cases with percent positivity of 2.8%

by the end of December 2021. By the end of December 2021 , five major urban areas of district Srinagar contain about 3.8% percent positivity of the confirmed cases (Batmaloo 4.1%,TRC 5.2%, SR gunj 2.9% and Khanyar 2.8%), shown in table 3. However, by the end of January 2022, a new pattern has been observed when about 11.4% percent positivity of the COVID-19 confirmed cases consists of five major regions of district Srinagar (Batmaloo 12.6%,TRC 21%,SR gunj 7.9% and Khanyar 8.0%), shown in table 4. However, by the end of December 2021, district Kupwara contributed 2.92% positivity of covid cases. About 8.7% positive cases of COVID-19 has been confirmed from district Kupwara by the end of January 2022.

**Table 1. Total samples received**

| District | December 2021 | January 2022 | Total |
|---|---|---|---|
| Kupwara | 13525 | 20616 | 34141 |
| Srinagar | 10914 | 11224 | 22138 |
| Total | 24439 | 31840 | 56279 |

**Table 2. The percent positivity of district Kupwara and Srinagar in the month of December 2021 and January 2022**

| District | Month | Positive | Negative |
|---|---|---|---|
| Kupwara | Dec 2021 | 8.7% | 91.2% |
| | Jan 2022 | 2.9% | 97% |
| Srinagar | Dec 2021 | 11.4% | 88.5% |
| | Jan 2022 | 3.81% | 96.1% |

**Table 3. The percent positivity of four different regions from district Srinagar in the month of December 2021**

| Regions | Total samples received | Positive | Negative |
|---|---|---|---|
| 1)Batmaloo | 5705 | 234 (4.1%) | 5471 (95.8%) |
| 2)TRC | 1321 | 69 (5.2%) | 1252 (94.7%) |
| 3)SR Gunj | 2499 | 74 (2.9%) | 2425 (97%) |
| 4)Khanyar | 1389 | 39 (2.8%) | 1350 (97.1%) |
| Total | 10914 | 416 (3.81%) | 10498 (96.1%) |

**Table 4. The percent positivity of four different regions from district Srinagar in the month of January 2022**

| Regions | Total samples received | Positive | | Negative | |
|---|---|---|---|---|---|
| 1)Batmaloo | 3528 | 447 | (12.6%) | 3081 | (87.3%) |
| 2)TRC | 1689 | 356 | (21%) | 1333 | (78.9%) |
| 3)SR Gunj | 3177 | 251 | (7.9%) | 2926 | (92%) |
| 4)Khanyar | 2830 | 227 | (8.0%) | 2603 | ( 91.9%) |
| Total | 11224 | 1281(11.4%) | | 9943 | (88.5%) |

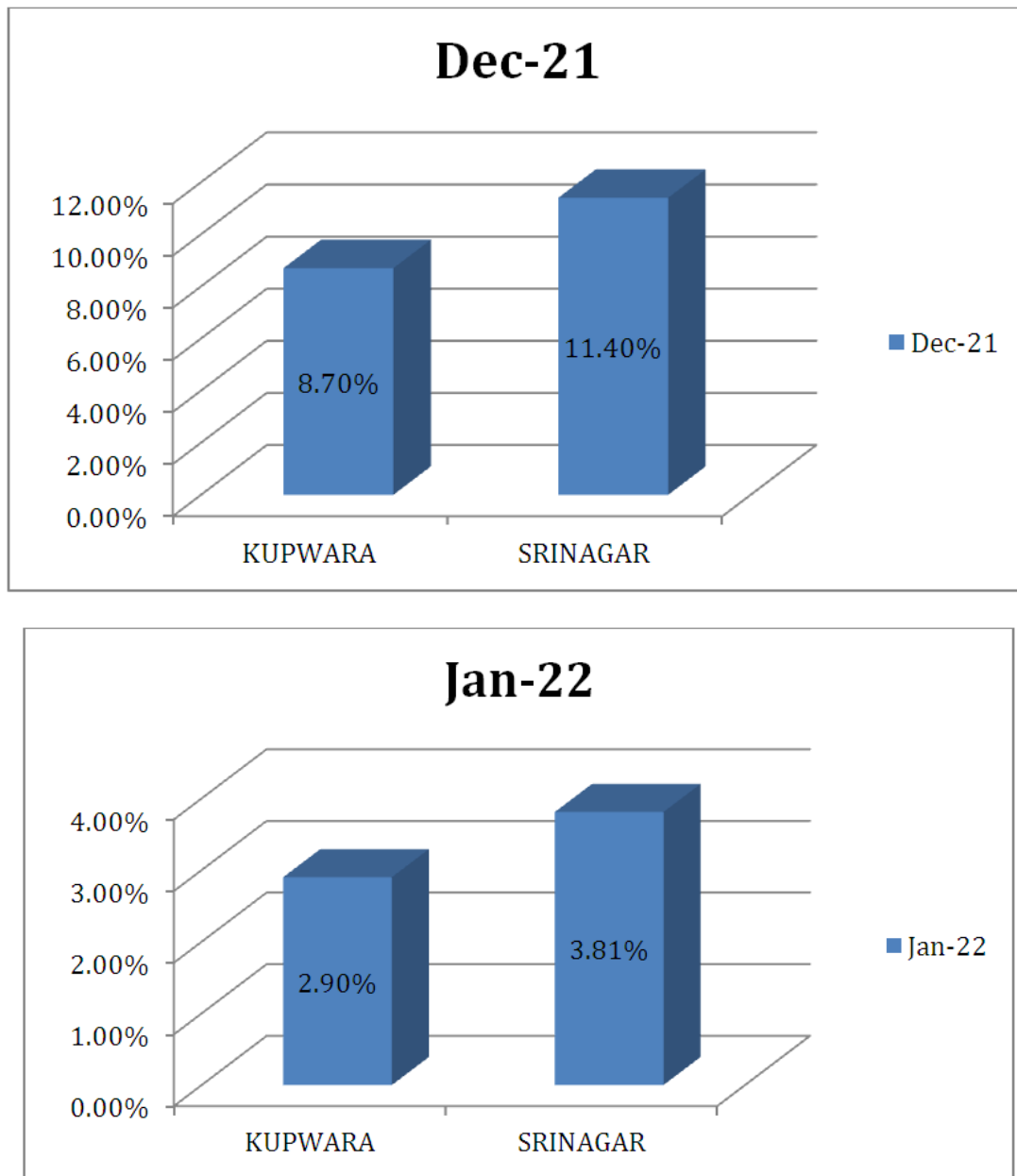## Dec-21



## Jan-22



**Fig. 1. Comparison of Positivity Rates in December 2021 and January 2022 of kupwara And Srinagar Districts**

## 4. SUMMARY AND DISCUSSION

India ranked second after the US, in terms of the total number of confirmed cases. More than eight million of COVID-19 cases were reported as of October 31,2020. The present study gave the information about the district level variations in COVID-19 cases from 1st December 2021 to January 31,2022. During the study period, the spread of COVID-19 has been increasing over the time. India imposed world's strictest nationwide lockdown beginning from 25th March,

2020 [21]. But, India was the third leading country after USA and Brazil's identified cases, as of 10th April,2021 [22]. India has been experiencing a huge cases of COVID-19, like many others parts of the world [23,24,25].

The second wave of COVID-19 has started in the middle of March 2021 and recorded the highest number of cases [24,25] about 144,829 as on April 2021. In India, the major affected states were Maharashtra, Delhi, West Bengal, Tamil

Nadu, Kerala, Karnataka and Jammu & Kashmir [21,23].

## 5. CONCLUSION

In this study, the COVID-19 pandemic was traced across Kupwara and Srinagar districts.It was seen that districts with higher population density showed increased COVID-19 risks. This pandemic have created a huge impact on health and economy globally, including India. To formulate policies and interventions, a proper spatial distribution of the disease and its correlates is needed.

In this study, we have seen that the COVID-19 infection ratio(IR) is significantly correlated to the population density and urban residence. The role of the government is difficult in controlling the pandemic in highly populated areas and also to maintain the social distancing in such areas. To control the spread of COVID-19 infection, we neeed to ensure the health and hygiene related facilities such as maintaining the quarantine centres, public health care institutions and improving public distribution system. To classify patients with asymptomatic conditions, more tests are required.There is a need to improve the healthcare facilities and human resources (doctors,nurses,frontline workers). There are few limitations in our study like the patients level of information (age,sex,comordties) are unavailable. Therefore, in this study the district level determinants are analyzed instead of individual level. Finally, we have correlated the percent positivity of the number of confirmed cases at the district level only which will help to frame the health policies and appropriate interventions.

## CONSENT

It is not applicable.

## ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Ludwig S, Zarbock A. Coronaviruses and SARS-CoV-2: A Brief Overview. Anesthesia and Analgesia. 2020;131(1): 93–6. Available:https://doi.org/10.1213/ANE.0000 000000004845 PMID: 32243297.
2. Worldometers. COVID-19 coronavirus pandemic. Retrieved June 30, 2020, Available:https://www. worldometers.info/coronavirus/2020.
3. Dwivedi LK, Rai B, Shukla A, Dey T, Ram U. Assessing the Impact of Complete Lockdown on COVID19 Infections in India and its Burden on Public Health Facilities A Situational Analysis Paper for Policy Makers International Institute for Population Sciences, Mumbai; 2020.
4. Schueller E, Klein E, Tseng K, Kapoor G, Joshi J, Sriram A, et al. COVID-19 in India: Potential Impact of the Lockdown and Other Longer-Term Policies. The Center For Disease Dynamics, Economics & Policy (CDDEP); 2020.
5. Wang T, Du Z, Zhu F, Cao Z, An Y, Gao Y, et al. Comorbidities and multi-organ injuries in the treatment of COVID-19. The Lancet. 2020;395(10228):e52. Available:https://doi.org/10.1016/S0140-6736(20)30558-4 PMID: 32171074.
6. Charlton E. This is how India is reacting to the coronavirus pandemic. World Economic Forum; 2020.
7. Soni P. These are the coronavirus quarantine facilities in India. Business Insider India. 2020..
8. Philip Debraj Ray Subramanian MS, Philip M, Ray D, Subramanian S, Parade Road St Thomas N, Chennai M. NBER Working Paper Series Decoding India's Low Covid-19 Case Fatality Rate Decoding India's Low Covid-19 Case Fatality Rate; 2020.
9. Dowd JB, Andriano L, Brazel DM, Rotondi V, Block P, Ding X, et al. Demographic science aids in understanding the spread and fatality rates of COVID-19. Proceedings of the National Academy of Sciences of the United States of America. 2020; 117(18):9696–8. Available: https://doi.org/10.1073/pnas.2004911117 PMID: 32300018
10. Nepomuceno MR, Acosta E, Alburez-Gutierrez D, Aburto JM, Gagnon A, Turra CM. Besides population age structure, health and other demographic factors can contribute to understanding the COVID-19 burden. Proceedings of the National Academy of Sciences. 2020;117(25): 13881–3.

Available:https://doi.org/10.1073/pnas.2008760117 PMID: 32576710.

11. Acharya R, Porwal A. A vulnerability index for the management of and response to the COVID-19 Epidemic in India: an Ecological Study; 2020.

12. Jain VK, Iyengar Karthikeyan P, Vaishya R. Differences between First wave and Second wave of COVID-19 in India. Diabetes & Metabolic Syndrome [Internet]. 2021 May 1 [cited 2021 Aug 16]; 15 (3):1047.
Available: /pmc/articles/PMC8106236/. https://doi.org/10.1016/j.dsx.2021.05.009 PMID: 33992554.

13. Chanda A. Epidemiology and Infection. [cited 2021 Aug 16];
Available: https://www.mohfw.gov.in/.

14. Mahajan P, Kaushal J. Epidemic Trend of COVID-19 Transmission in India During Lockdown-1 Phase. Journal of Community Health. 2020;(0123456789).
Available:https://doi.org/10.1007/s10900-020-00863-3 PMID: 32578006.

15. Srivastava Ankita, Tamrakar Vandana, Moradhvaj Moradhvaj, Saddaf Naaz Akhtar Krishna Kumar, Saini Tek Chand, et al. Geographical Variation in COVID-19 Cases, Prevalence, Recovery and Fatality Rate by Phase of National Lockdown in India, March 14-May 29, 2020.

16. MHA. New Guidelines on the measures to be taken by Ministries/Department of Government of India, State/UT Governments and State/UT authorities for containment of COVI-19 in the country for the extended period of National Lockdown for a further period of two we. 40-3/2020-DM-I (A) India; 2020.

17. Singh SS. Corona Virus. The mystery of the low COVID-19 numbers in West Bengal. The Hindu. 2020 May.

18. Acharya R, Porwal A. A vulnerability index for the management of and response to the COVID-19 epidemic in India: an ecological study. The Lancet Global Health. 2020 Aug.

19. Golechha M, Panigrahy RK. COVID-19 and heatwaves: a double whammy for Indian cities. The Lancet Planetary Health. 2020; 4:e315–6.
Available:https://doi.org/10.1016/S2542-5196(20)30170-4 PMID: 32730749.

20. COVID-19-India. COVID-19 India Dashboard.
Available: https://api.covid19india.org/documentation/csv/. 2020.

21. Lancet T. India's COVID-19 emergency. The Lancet. 2021 May 8; 397(10286):1683.

22. Worldometer. COVID-19 corona virus Pandemic. 2021. 2021.

23. Sarkar A, Chouhan P. COVID-19: District level vulnerability assessment in India. Clinical Epidemiology and Global Health. 2021; 9:204–15.
Available:https://doi.org/10.1016/j.cegh.2020.08.017 PMID: 32901227.

24. Ghosh K, Sengupta N, Manna D, De SK, Gutie´rrez-ocampo E, Villamizar-peña R, et al. Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID- 19. The COVID-19 resource centre is hosted on Elsevier Connect, the company' s public news and information. Travel Med Infect Dis J. 2020;(January).

25. Kar SK, Ransing R, Arafat SMY, Menon V. Second wave of COVID-19 pandemic in India: Barriers to effective governmental response. E Clinical Medicine [Internet]. 2021 Jun 1;36.
Available:https:// doi.org/10.1016/j.eclinm.2021.100915 PMID: 34095794.

*Peer-review history:*
*The peer review history for this paper can be accessed here:*
*https://www.sdiarticle5.com/review-history/89503*