



Post Covid effect in Jharkhand: A Review

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1. Abstract

COVID-19 is the first global pandemic in a century and it is the third infection of CoVs among humans. Corona virus is belonging to the Coronaviridae family and subfamily coronavirinae. Its represent crown like spikes on the outer surface of the virus, thus it was named as a corona virus. COVID-19 is a highly transmittable and pathogenic viral infection caused by severe acute respiratory syndrome corona virus 2 which emerged in Wuhan, China and spread around the world. Since December 2019, we have been in the battlefield with a new threat to the humanity known as severe acute respiratory syndrome corona virus 2 (SARS-CoV-2).

The state of Jharkhand, post covid effect on human health in Jharkhand such as physical fibrosis of the lungs, cardiac arrests, renal failures, neurological problems, swelling on faces and diabetes are the most common among the complications. Mental health also triggers anxiety, depression, panic attack and even suicidal tendencies. Children are suffered in this pandemic, hundreds of children orphaned and single parent in this year. Government of Jharkhand and PM-CARE funds contribute rupees for each of them.

The patients who recovered from COVID-19 infection facing many complication physically and mentally. Post COVID patients needs to regularly take breathing exercise to remodulate the functioning of their lungs, and take good food for boosts their immunity, also care about their mental health condition. Individuals need to take measures such as masks, gloves, sanitizers, eye protection to safeguard them form the disease.

Keywords: Corona virus, Post covid effect, Jharkhand, SARS- CoV- 2, Recent data.

2. Introduction

2.1. Coronavirus

There has been no other global pandemic in the past 100 years. The Spanish Flu is the last such pandemic occurred in 1918, and within months 1/5th of the world population had been infected. Today COVID-19 pandemic is the global health disaster to the universe (Trilla et al., 2008 and Hassn et al., 2020). Corona illustrate crown like spikes on the outer surface of virus; thus it was called as a coronavirus. Coronavirus is belong to coronaviridae family and subfamily coronavirinae, which consist of four genera such as Alphacoronavirus, Betacoronavirus, Gamma-coronavirus and Deltacoronavirus (Muller et al., 1996). These genera were based on genomic construction and phylogenetic relationship. Corona virus are minute in size (65-125nm in diameter) and contain single stranded RNA as a nucleic material, size ranging from 26-32kbs in length (Muller et al., 1996, and Cui et al., 2019, and Zhong et al., 2003).

2.1.1. History

COVID-19 is the first global pandemic in a century and it is the third infection of CoVs among humans. In the history of coronavirus, Chinies population was infected with a virus causing Severe Acute Respiratory Syndrome in Guangdong province in 2003. The virus was a member of Beta coronavirus subgroup and was named SARS-CoV (Peiris et al., 2004 and Pyrcet al., 2007). In later 2012, a Saudi Arabian couple infected with another coronavirus, named Middle East Respiratory Syndrome Coronavirus (Rahman and Sarkar., 2019). In the middle of December 2019 a series of undetermined “pneumonia” cases reported in Wohan, in Hubei Province in China- it increase rapidly around the globe (Huang et al., 2020 and Chen et al., 2020). In 7 January 2020, a novel coronavirus, originally condensed as 2019-nCoV by WHO, first patient was identified from throat swab sample (Hui et al., 2020). The pathogen was later renamed as Severe Acute Respiratory Syndrome Coronavirus-2 by coronavirus study group (Gorbalenya AEA, 2020). SARS-CoV-2 is considered a novel human infecting betacoronavirus (Lu et al., 2020). In the January 30, who declared the SARS-CoV-2 outbreak as a Public

Health Emergency of International Concern (Burki TK., 2020).

2.1.2. Phylogenetic analysis

Phylogenetic analysis of the SARS- CoV-2 genome is closely related to two Bat-derived SARS like coronavirus with 88% identity collected in 2018 in eastern China (bat-SL-CoVZC45 and bat-SL-CoVZC21) and genetically independent from SARS-CoV with 79% similarity and MERS-CoV (Lu et al., 2020). A further study of SARS-CoV-2, RaTG13, and SARS-CoV, found that the virus is more related to Bat CoV RaTG13, bat coronavirus previously detected to *Rhinolophus affinis* from Yunnan Province with 96.2% identity (Zhou et al., 2020). Entirely, these finding recommend that bats might be original host of this virus (Lu et al., 2020 and Zhou et al., 2020). Genomic variations in SARS- CoV-2, the orf1ab is the largest gene which encodes the pp1ab protein and 15nsp. The orf1a gene encode for pp1a protein which also contain 10nsp (Wu et al., 2020 and Chen et al., 2020). Recent studies in the variation of SARS-CoV- and SARS-CoV-2 such as absence of 8a protein and variation in the number of amino acid is 8b and 3c protein in SARS-CoV-2 (Chen et al., 2020).

2.1.3. Alignment sequence

Sequence alignment analysis of the coronavirus genome indicates non-structural and structural proteins being 60% and 45% identical, respectively, among various types of CoVs (Zhou et al., 2020). These data show that nsps are more conservative than structural proteins. RNA viruses have a higher mutational load as a result of shorter replication times (Figure 1) (Zhou et al., 2020). Based on comparative genomic studies between SARS-CoV-2 and SARS-like coronaviruses, there are 380 amino acid substitutions in the nsps genes and 27 mutations in genes encoding the spike protein S of SARS-CoV-2. These variations might explain the different behavioral patterns of SARS-CoV-2 compared to SARS-CoVs (Petrosillo et al., 2020). For example, the primary N501 T mutation in the Spike protein of SARS-CoV-2 could have significantly increased its binding affinity to ACE2 (Li et al., 2020).

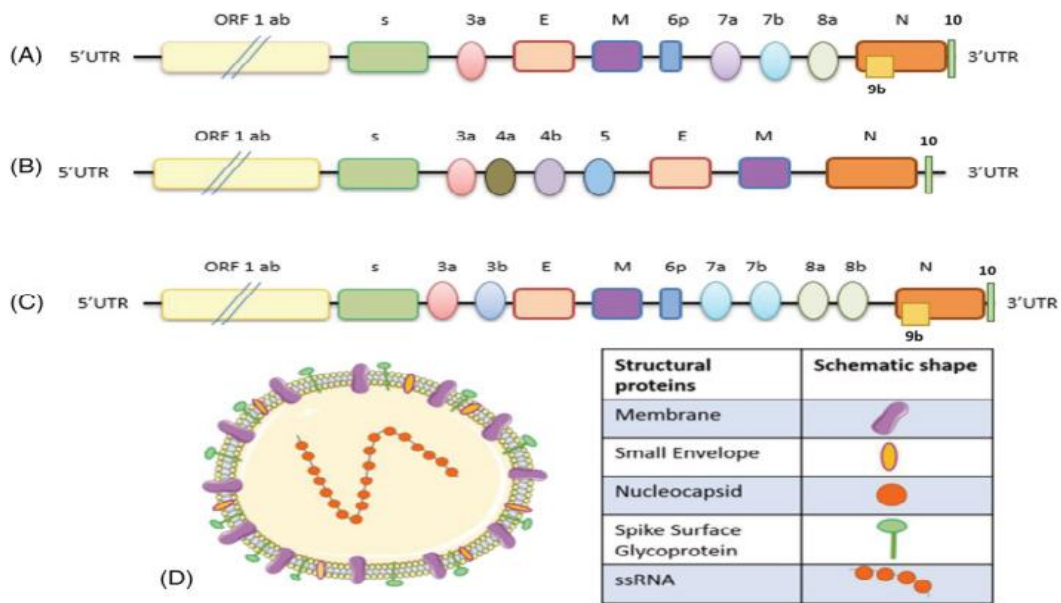


Figure: 1 The schematic genomic structure of coronavirus. a (COVID 19) .b MERs-CoV.c) SARS CoV.d) coronavirus coding structural protein (Zhou et al., 2020).

2.1.4. Symptoms

The symptoms of COVID-19 is fever, runny nose, painful breathing, malaise, wheezing and shortness of breath. Nausea and diarrhea also reported in COVID patient. The incubation period is estimated to be 2-14 days (Ezhilan et al., 2021). The virus can spread through saliva when speaking, through droplets when breathing, and contact with contaminated surface (Ong et al., 2020 and Van doremalen et al., 2020). Now a days, >131 million people have been infected and at

least 2.8 million people died from COVID-19 worldwide (Google Website).

2.1.5. Replication cycle

The replication cycle of COVID-19 as any other virus requires a host cell and normally includes attachment, penetration, uncoating, replication, assembly, and release steps. Representation of a schematic cellular uptake and replication of SARS-CoV-2 virus is shown in Fig. 2 (Goldman-Israelow B.,2020).

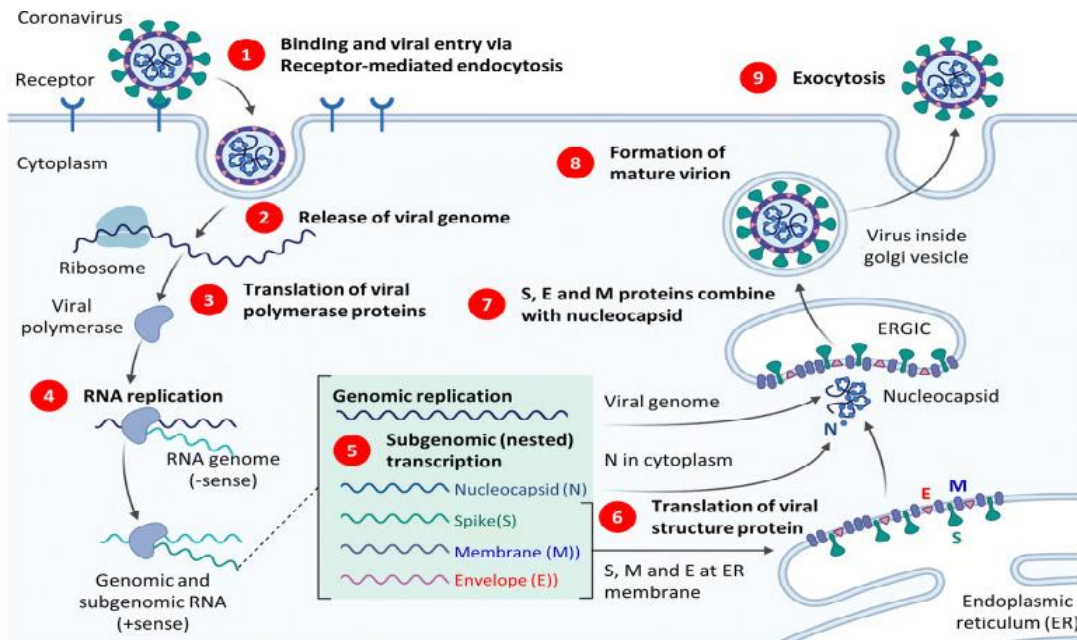


Figure: 1 Overview of the corona virus replication cycle (Goldman- israelow B., 2020).

2.1.6. Post covid

At present, many thousands of hospitalized patients have recovered and discharged, but many recovered patients have positive for SARS-CoV-2 during post discharge surveillance (China Daily Website; 2020 and Lan et al., 2020), which suggests that discharged patients still virus carries. In this COVID-19 pandemic, schools and many businesses were closed. Sports events were postponed and social activity levels decreased. The isolation period may cause psychological effects such as depression and anxiety because of people's living conditions, decrease in social and physical contact, separation from their loved ones (Brooks et al., 2020 and Wong et al., 2005). Depression is defined by depressed mood, lack of energy, anhedonia and insomnia, that affects people's daily functions (WHO Press; 2017). Depression and Anxiety affect 300 million people, according to World Health Organization (WHO Press; 2017).

2.2. About Jharkhand

Jharkhand "The land of forest" is a state in eastern India, created on 15 November 2000, from what was previously the southern half of Bihar. The state shares its border with the states of Bihar to the north, Uttar Pradesh to the northwest, Chhattisgarh to the west, Odisha to the south and West Bengal to the east. It has an area of 79,710 km² (30,778 sq mi). It is the 15th largest state by area, and the 14th largest by population. Hindi is the official language of the state. The city of Ranchi is its capital and Dumka its sub capital. The state is known for its waterfalls, hills and holy places; Baidyanath Dham, Parasnath and Rajrappa are major religious sites (Jharkhand Gov Website).

Area : 79,714 km²

Capital City : Ranchi

District : 24

Population : 3.3 Cror (Jharkhand Gov Website)

In Jharkhand, the 1st case of COVID-19 was detected on 31st March 2020 in Ranchi district, who was a foreign national attended some religious congregation with many thousands of people in other state a few days back. On 29th March, India had 106 patients in 2 months time after the 1st case detection (Jharkhand Gov Website, 2020). Also, in Jharkhand, 88 cases in one month as on April 30th 2020 (Jharkhand Website, 2020).

2.3. Post Covid effect on human health

Although Covid-19 cases have begun declining in Ranchi, post Covid complications are emerging as silent killers (Google Website). Covid patients, including those who recovered in home isolation, are developing critical complications. Fibrosis of the lungs, cardiac arrests, renal failures, neurological problems, swelling on faces and diabetes are the most common among the complications. Overuse of steroids during treatment can lead to diabetes while usage of blood thinners to prevent clotting in lungs and the heart can lead to internal bleedings and multiorgan failures. "A Covid-19 negative report does not indicate that an individual is alright," said Dr Sanjay Kumar, vice-president of Ranchi's Bhagwan Mahavir Medica Superspecialty Hospital. Once recovered, patients try to return to their normal lives and resume work and in process, they ignore the symptoms of the post Covid-19 complications. Singh, a veteran physician in Ranchi, said, "In many cases, doctors go by the common protocol such as prescribing doxycycline, Ivermectin and other drugs when infection kicks in. The important markers, which can be ascertained through tests like CRP, D-dimer and TCDC tests, are ignored. Post Covid complications can surface anywhere between seven days to nine months and can kill patients silently." Kumar added that patients who recovered from Covid-19 infection must also regularly take up breathing exercises to re-modulate the functioning of their lungs. "Owing to low immunity, Covid-19 patients are succumbing to bacterial and fungal infections of the lungs. "Since the cases are decreasing and bed occupancy is falling, we plan to carve out a post Covid-19 care facility from out of the 1,108 Covid-19 beds. Currently, we have asked all departments to submit a plan of action regarding the post Covid-19 management. We are monitoring the situation for a week before setting up the facility," Rims director Dr Kameshwar Prasad told TOI (Google Website). Dr Nishit Kumar, the pulmonologist at Orchid Medical Centre, said he has seen an increase in fungal infection among recovered patients and many are admitted to his hospital. "Recovered patients are visiting us with different kinds of complications and fungal infection is one of them. Many have also complained about an acute spike in their blood sugar levels and bacterial infection" (Google Website). Nodal officer of the post-Covid clinic at the Ranchi district hospital, Dr Ajit Kumar, said: "Patients visiting our clinic are of two types- one who are psychologically shaken and the other who are developing minor as well as major

complications. Three patients have been admitted to the district hospital, too, after they developed breathing difficulty and symptoms of infection in the salivary gland. The problem starts when people come with very high blood sugar and blood pressure levels. Such people are susceptible to heart attacks which might prove fatal.” Assistant professor of Rims cardiology department, Dr Prashant Kumar, said, “We have received a few cases of myocardial infarction (MI) in patients who had a history of Covid infection in the recent past. People who have been infected by the virus must go for regular testing of their heart and other pathological tests like D-Dimer and CRP so that they could be provided proper management for any cardiac ailments” (Google Website).

2.3.1. Mental health complication

There is no study to prove that Covid has direct impact on mental health but the kind of challenges people are facing, it obviously triggers anxiety, depression, panic attack and even suicidal tendencies at times (Google Website). Around 100 calls every day on the help lines were received but it is difficult to identify how many of them are related to post-Covid complication while adding that around 40% of the calls were personally attended are related to Covid. The state mental health authority, which decided to constitute a tele-psychotherapy committee at RINPAS hospital, Ranchi, Jharkhand back in December 2019, also underlined the need for tele-counselling at this point of time. The committee that was ultimately constituted on April 3 this year is still to float a helpline number though. Dr Sinha, who is also a member of the committee, admitted that Covid-related anxiety has precipitated into psychotic conditions in some individuals. “Isolation, social ostracisation, fear of complications and uncertainty of medical attention because of lack of beds and facilities coupled with financial constraints have affected a large population,” he said. “Anxiety often leads to severe clinical conditions like panic attacks and suicidal tendencies,” Sinha said, adding many people turn up to cardiologists as they experience palpitations, cold sweats and uneasiness. Admitting that awareness about seeking medical help from experts is still low, Sinha said personal counseling and medication at times can help to a great extent (Google Website).

2.3.2. Impact on children

The deadly coronavirus infection, that has killed over 5,000 people across Jharkhand since its outbreak last

year, has also left hundreds of children orphaned or single parent, mostly after the onset of its second wave in early April this year. The department of women, child development and social security has so far identified 234 such children, officials said on Sunday. Chief minister Hemant Soren recently said that the government will take care of children who lost their parents to the pandemic. The government has issued the help line number of such children (Google Website).

Ranchi’s CWC chairperson Rupa Verma said, a school student, who lost his parents, was now staying with his uncle, he said that he doesn’t want to stay with his uncle. About financial assistance scheme for such children, Verma said under a state government scheme, orphan children will be given an assistance of rupees 2,000 per month, besides other facilities, including food and education. Earlier, Prime Minister Narendra Modi also announced a number of welfare measures for children who lost their parents to COVID-19. The Centre recently announced that PM-CARES fund will contribute through a specially designed scheme to create a corpus of rupees 10 lakh for each of them, when he or she reaches 18 years of age (Google Website).

2.4. Preparation for third wave of Covid-19

The health minister Banna Gupta reviewed various aspects of the pandemic’s management, including reviewing the infection rate district wise, expediting the vaccination drive and availability of essential drugs and oxygen supply. The officials presented a roadmap on strengthening the healthcare services to stop the spread of black fungus cases. The official preparedness to handle a possible third wave was also reviewed at the meeting. Banna Gupta said keeping the onset of a possible third wave in mind, we have planned for some major infrastructural changes in our paediatric care unit as we will require NICU and SNCU in large number in case the third wave starts infecting kids (Google Website).

In meeting decided that state will require paediatric ICUs at CHCs, PHCs as well as at the district hospitals to treat the infected kids, if any. The government has also planned to keep ambulances, ventilators and mobile RT-PCR labs ready to test and track the infection among the kids. Health minister said they are planning to rope in the services of final year MBBS students after providing them an initial training in the treatment protocols of COVID-19 (Google Website)

2.5. COVID-19 Cases on 16 June 2021 at 9:00 pm in Jharkhand

Table 1. recent COVID-19 cases data in Jharkhand (Jharkhand Government Website)




COVID-19 BULLETIN - JHARKHAND

Data as on 16.06.2021 at 9.00 PM




COVID-19 Bulletin also available at covid19dashboard.jharkhand.gov.in

(I) Status of Sample Testing of Suspects & COVID-19 Cases

Sr. No.	Activity	Cumulative till Yesterday	Today Status	Grand Total
A) Sample Testing				
1	Total Number of Samples Collected	9185461	41107	9226568
2	Total Number of Samples Tested	9175094	41065	9216159
3	Number of Negative cases	8831291	40875	8872166
4	Number of Positive cases	343793	190	343983
5	Number of Cases declared Recovered & Discharged	336058	587	336645
6	Number of Death	5089	3	5092
7	Total Active Cases			2246

(II) District wise breakup of All COVID-19 Cases

Sr. No.	District	Cumulative till Yesterday				Today Status		
		Total Active Cases	Total Recovered & Discharged	Total Deaths	Total Positive Cases	No. of New Positive Cases	Recovered & Discharged	Death
1	Bokaro	74	18745	274	19093	9	21	0
2	Chatra	87	5809	53	5949	12	7	0
3	Deoghar	58	10482	112	10652	6	8	1
4	Dhanbad	124	15738	378	16240	16	15	0
5	Dumka	45	4517	45	4607	0	0	0
6	East Singhbhum	246	50009	1031	51286	35	39	0
7	Garhwa	122	6555	94	6771	2	72	0
8	Giridih	49	8695	130	8874	5	18	0
9	Godda	14	5669	86	5769	4	0	1
10	Gumla	86	9609	36	9731	10	16	0
11	Hazaribagh	151	19071	184	19406	18	23	0
12	Jamtara	15	5380	59	5454	4	0	0
13	Khunti	67	7577	94	7738	0	6	0
14	Koderma	43	12547	136	12726	7	19	0
15	Latehar	85	7550	57	7692	6	17	0
16	Lohardaga	31	6499	88	6618	3	3	0
17	Pakur	1	2525	12	2538	1	0	0
18	Palamu	68	12040	110	12218	4	16	0
19	Ramgarh	42	13504	196	13742	3	15	0
20	Ranchi	933	82483	1581	84997	20	245	1
21	Sahebganj	33	4617	42	4692	2	10	0
22	Saraikela	78	7009	67	7154	1	16	0
23	Simdega	135	6756	91	6982	19	9	0
24	West Singhbhum	59	12672	133	12864	3	12	0
Total		2646	336058	5089	343793	190	587	3

(IV) Other Indicators

	Indicators	India	Jharkhand
1	7 days Growth Rate	0.17%	0.05%
2	7 days Doubling Rate	398.87 days	1378.06 days
3	Recovery Rate	95.80%	97.86%
4	Mortality Rate	1.30%	1.48%

3. Conclusion

The current COVID-19 pandemic is clearly an international public health problem. Currently, the COVID -19 diseases has caused thousands of infections and deaths. And many hospitalized patients recovered from COVID but they face many physical and mental health problems. In conclusion, post COVID-19 physical complication like fibrosis of lungs, cardiac arrests, neurological problems, swelling and many more. And the post-COVID-19 fatigue and anhedonia were common after recovery from novel coronavirus infection. Once recovered, they ignore the symptoms of the post COVID -19 complications. We need to spread awareness about their post COVID effect on health and that patients who recovered from COVID-19 infection must also regularly take up breathing exercise to re- modulate the functioning of their lungs, and take healthy foods to boosts their immunity. Also encourage about yoga and meditation for their mental health condition.

Therefore, individuals need to take measures such as isolaton, hand hygiene, and use of personal protective equipment, mainly surgical masks, eye protection, gloves, and gowns to safeguard themselves from the disease.

References

1. Brooks SK, Webster RK, Smith LE, et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *Lancet*. 2020;395(10227):912–920.
2. Burki TK. Coronavirus in China. *Lancet Respir Med* 2020.
3. Chen N, Zhou M, Dong X, Qu J, Gong F, Han Y, Qiu Y, Wang J, Liu Y, Wei Y, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: A descriptive study. *Lancet*. 2020; 395:507–13. doi:10.1016/S0140- 6736(20)30211-7.
4. Chen Y, Liu Q, Guo D. Emerging coronaviruses: genome structure, replication, and pathogenesis. *J Med Virol* 2020.
5. COVID-19 pandemic in Jharkhand.
6. Cui J, Li F, Shi Z-L. Origin and evolution of pathogenic coronaviruses. *Nat Rev Microbiol* 2019; 17:181-192.
7. Goldman-Israelow B. Coronavirus replication cycle (template). [BioRender.com](https://www.biorender.com/templates/figures/5e99f5395fd61e0028682c01/t-5e56d97d1b689000850f8f93-coronavirus-replication-cycle); 2020 [cited2020,11/01/2020]; Available from: <https://app.biorender.com/biorender-templates/figures/5e99f5395fd61e0028682c01/t-5e56d97d1b689000850f8f93-coronavirus-replication-cycle>.
8. Gorbalenya AEA. Severe acute respiratory syndrome-related coronavirus: the species and its viruses – a statement of the Coronavirus Study Group. *BioRxiv* 2020, <http://dx.doi.org/10.1101/2020.02.07.937862>.
9. Hassan S, Sheikh FN, Jamal S, Ezech JK, Akhtar A (2020) Coronavirus (COVID-19): A Review of Clinical Features, Diagnosis, and Treatment. *Cureus* 12: e7355.
10. <https://www.ecdc.europa.eu/en/geographical-distribution-2019-ncov-cases>(Assessed on 8th April 2021).
11. https://www.google.com/url?sa=t&source=web&rct=j&url=https://m.timesofindia.com/city/ranchi/post-covid-complications-rise-in-absence-of-specialised-careclinics/amp_articleshow/82840364.cms&ved=2ahUKEwif74OHxaPxAhVfwjGHHvbgD5EQFjAAegQIBxAC&usg=AOvVaw2yn7BUYKB4U3f6Mtwof7vD&cshid=1624100468261.
12. https://www.google.com/url?sa=t&source=web&rct=j&url=https://m.timesofindia.com/city/ranchi/new-cases-dip-but-post-cov-complications-on-rise-in-city/amp_articleshow/83320645.cms&ved=2ahUKEWjbhuCox6PxAhVbX30KHbiGBQoQFjABegQIBhAC&usg=AOvVaw1ld3CAdT-dwN4ijEfoe7C8&cshid=1624100988946.
13. https://www.google.com/url?sa=t&source=web&rct=j&url=https://m.timesofindia.com/city/ranchi/post-covid-mental-health-issues-on-rise/amp_articleshow/83268453.cms&ved=2ahUKEwjlvjvB96LxAhU18HMBHfOXA3oQFjABegQIBhAC&usg=AOvVaw0_Z4LyfETxE SYWOR4pE UE&cshid=1624081123898.
14. <https://www.google.com/url?sa=t&source=web&rct=j&url=https://www.hindustantimes.com/cities/ranchi-news/over-234-j-khand-children-lost-parents-in-covid-19-second-wave-101622995889936amp.html&ved=2ahUKEwi1kIre9qrxAhUNfisKHYo0DUcQFjAFegQIDBAC&usg=AOvVaw2Y0vK4HSTdX4vZr8t44qng&cf=1&cshid=1624354515096>.

15. <https://www.google.com/url?sa=t&source=web&rct=j&url=https://www.hindustantimes.com/cities/ranchi-news/over-234-j-khand-children-lost-parents-in-covid-19-second-wave-101622995889936-amp.html&ved=2ahUKEwi1kIre9qrxAhUNfisKHYo0DUcQFjAFegQIDBAC&usg=AOvVaw2Y0vK4HSTdX4vZr8t44qnq&cf=1&cs=hid=1624354515096>.
16. <https://www.mygov.in/covid-19>.
17. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, Zhang L, Fan G, Xu J, Gu X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet*. 2020;395:497–506. [doi:10.1016/S0140-6736\(20\)30183-5](https://doi.org/10.1016/S0140-6736(20)30183-5).
18. Hui DS, E IA, Madani TA, Ntoumi F, Kock R, Dar O, et al. The continuing 2019-nCoV epidemic threat of novel coronaviruses to global health – the latest 2019 novel coronavirus outbreak in Wuhan, China. *Int J Infect Dis* 2020;91:264–6.
19. Lan L, Xu D, Ye G, Xia C, Wang S, Li Y, et al. Positive RT-PCR test results in patients recovered from COVID-19. *J Am Med Assoc* 2020;323(15):1502e3. <https://doi.org/10.1001/jama.2020.2783>.
20. Li Z, Yi Y, Luo X, et al. Development and clinical application of a rapid IgM-IgG combined antibody test for SARS-CoV-2 infection diagnosis. *J Med Virol*. 2020;92(9):1518-1524. [\[PMC free article\] \[PubMed\] \[Google Scholar\]](https://doi.org/10.1093/jid/fiaa283)
21. Lu R, Zhao X, Li J, Niu P, Yang B, Wu H, et al. Genomic characterisation and epidemiology of 2019 novel coronavirus: implications for virus origins and receptor binding. *Lancet* 2020.
22. M. Ezhilan, I. Suresh, N. Nesakumar, SARS-CoV-2, MERS-CoV and SARS-CoV-2: diagnostic challenge Measurement. 168 (2021), 108335, <https://doi.org/10.1016/j.measurement.2020.108335>.
23. Müller H, Stuart G. Siddell, H. Fraenkel-Conrad, RR Wagner Eds. *The Coronaviridae. The Viruses*, Plenum Press, New York-London (1995), Urban & Fischer; 1996; pp. 1-418.
24. N. van Doremalen, T. Bushmaker, D.H. Morris, M.G. Holbrook, A. Gamble, B.N. Williamson, A. Tamin, J.L. Harcourt, N.J. Thornburg, S.I. Gerber, Aerosol and surface stability of SARS-CoV-2 as compared with SARS-CoV-1, *N. Engl. J. Med.* 382 (16) (2020) 1564–1567, <https://doi.org/10.1056/NEJMc2004973>.
25. National Health Commission. Recovered patient rehospitalized after positive test. Beijing: China Daily Website; 2020. Chinese. Available from: <http://ex.chinadaily.com.cn/exchange/partners/45/rss/channel/www/columns/2n8e04/stories/WS5e4fc442a31012821727963c.html>.
26. Peiris J, Guan Y, Yuen K. Severe acute respiratory syndrome. *Nat Med* 2004;10(12):S88–97.
27. Petrosillo N, Viceconte G, Ergonul O, Ippolito G, Petersen E. COVID-19, SARS and MERS: are they closely related? *Clin Microbiol Infect*. 2020;26:729-734. [\[PMC free article\] \[PubMed\] \[Google Scholar\]](https://doi.org/10.1016/j.cmi.2020.05.039)
28. Pyrc K, Berkhout B, Van Der Hoek L. Identification of new human coronaviruses. *Expert Review of Anti-infective Therapy* 2007;5(2):245–53.
29. Rahman A, Sarkar A. Risk factors for fatal middle east respiratory syndrome coronavirus infections in Saudi Arabia: analysis of the WHO Line List, 2013–2018. *Am J Public Health* 2019;109(9):1288–93
30. S.W.X. Ong, Y.K. Tan, P.Y. Chia T.H., Lee, O.T. Ng, M.S.Y. Wong, K. Marimuthu, Air, surface environmental, and personal protective equipment contamination by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) from a symptomatic patient. *J. Am. Med. Assoc.* 323(16) (2020) 1610–1612, [doi:10.1001/jama.2020.3227](https://doi.org/10.1001/jama.2020.3227).
31. Trilla A, Trilla G, Daer C. The 1918 “Spanish Flu” in Spain. *Clin Infect Dis*. 2008;47:668–73.
32. Zhong N, Zheng B, Li Y, Poon L, Xie Z, Chan K, et al. Epidemiology and cause of severe acute respiratory syndrome (SARS) in Guangdong, People’s Republic of China, in February, 2003. *The Lancet* 2003;362(9393):1353–8.
33. Wong TW, Yau JK, Chan CL, et al. The psychological impact of severe acute respiratory syndrome outbreak on healthcare workers in emergency departments and how they cope. *Eur J Emerg Med*. 2005;12(1):13–18.

34. World Health Organization. Depression and other common mental disorders global health estimates. Geneva, Switzerland: WHO Press; 2017. Available from: <http://apps.who.int/iris/bitstream/handle/10665/254610/WHO-MSD-MER-2017.2-eng.pdf;jsessionid=DE57F4EB26E755A59FFFBA39D23FEF9F?sequence=1>.
35. www.jharkhand.gov.in.
36. Zhong N, Zheng B, Li Y, Poon L, Xie Z, Chan K, et al. Epidemiology and cause of severe acute respiratory syndrome (SARS) in Guangdong, People's Republic of China, in February, 2003. The Lancet 2003; 362 (9393): 1353–8.
37. Zhou P, Yang XL, Wang XG, Hu B, Zhang L, Zhang W, et al. A pneumonia outbreak associated with a new coronavirus of probable bat origin. Nature 2020.
38. Zhou P, Yang X-L, Wang X-G, et al. A pneumonia outbreak associated with a new coronavirus of probable bat origin. Nature. 2020; 579:270-273. [PMC free article] [PubMed] [Google Scholar].

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