

# Impact of COVID 19 Pandemic on Surgical Specialties in a Tertiary Care Hospital in India

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**Abstract:** ***Background:** The global pandemic caused by the novel human coronavirus (SARS-CoV-2) has resulted in unprecedented changes in the modern healthcare system. The pandemic has led to massive redirection of health care resources to treat the surge of COVID-19 patients. Elective surgical cases have been cancelled, outpatient clinics have reduced and there has been a reduction in the number of patients presenting with surgical emergency. **Objective:** The aim of this article is to evaluate the impact of COVID-19 on surgical specialties in a tertiary care hospital in Durg, Chhattisgarh, India. **Material and methods:** The data was collected from the digitalized record system of Jawaharlal Nehru Hospital and Research Centre (JLNHRC), O.T. Registry in O.T. Complex of JLNHRC for the period of 3 years from April 2018 to March 2021. COVID-19 statistics were obtained from the official government websites. **Results:** Statistically significant decrease was seen in almost all aspects of surgical specialties due to the pandemic. During the 2nd wave some specialties have improved compared to the 1st wave but unfortunately not to the pre pandemic levels. **Conclusion:** The pandemic has brought tremendous downfall in all aspects of surgical care; though with time and better knowledge of the disease recovery to previous levels can be slowly expected.*

**Keywords:** COVID-19, Pandemic, Surgery

## 1. Introduction

At the end of 2019, Wuhan an emerging business hub of China experienced an outbreak of a novel coronavirus that killed more than eighteen hundred and infected over seventy thousand individuals within the first fifty days of the epidemic. The International Committee on Taxonomy of Viruses (ICTV) named the virus as SARS-CoV-2 and the disease as COVID-19 (1). In India first case of COVID-19 infection was reported in Kerala, in a 20 year old female (2). The 1st case in Chhattisgarh was reported on 19th March, 2020 where a woman returning from London via Mumbai airport tested positive (3).

On the evening of 24 March 2020, the Government of India under Prime Minister Narendra Modi ordered a nationwide lockdown for 21 days, limiting movement of the entire 1.38 billion (138 crore) population of India as a preventive measure against the COVID-19 pandemic in India. It was ordered after a 14-hour voluntary public curfew on 22 March, followed by enforcement of a series of regulations in the country's COVID-19 affected regions. The lockdown was placed when the number of confirmed positive coronavirus cases in India was approximately 500. The nationwide lockdown continued from 25th March, 2020 to 31st May, 2020 after which lockdown was gradually lifted (6). With an urban population of 1,064,077, Durg-Bhilai is the second largest urban area after Raipur in the Indian state of Chhattisgarh (7). It ranks 100th according to population among 640 districts in India (8).

As of 15 April, 2021 Durg had 20,986 of the total 1,21,769 active cases in Chhattisgarh, behind Raipur at 25,394. According to Ministry of Health and Family Welfare data, it

is also among the top 15 high caseload districts in the country.

At the time of writing this article in May, 2021 there are 2.63 crore total cases in India amongst which 2.31 crore have recovered and 2.96 lac deaths have occurred; among these Chhattisgarh has 9.41 lac confirmed cases out of which 8.53 lac have recovered and 12,391 have deceased (4).

COVID-19 has affected the entire medical field with decrease in the percentage of patients presenting with endemic or non COVID-19 disease, in this article we would like to gauge the effect on the surgical field.

## 2. Objective

This article evaluates the impact of COVID-19 on surgical specialties in a tertiary care hospital, Jawaharlal Nehru Hospital and Research Centre (JLNHRC) in Durg, Chhattisgarh, India.

**Material and Methods:** Study design: retrospective observational

**Study place:** Jawaharlal Nehru Hospital and Research Centre (JLNHRC) (860- bedded hospital) (5)

**Study time:** April, 2018 to March 2021

**Data collection:** All the data was collected by the 3 authors from the computerized record section of JLNHRC where records are regularly and securely maintained.

Emergency and elective surgery data was analyzed. There were some pitfalls and irregularities in the data which was

further verified from the original data registry of O.T. Complex of JLNHRC.

### 3. Methodology

Data collected through official records coded, entered and analysed using Microsoft Excel software. Data were then imported into Statistical Package for the Social Sciences (SPSS) version 20.0 software for analysis. According to the type of data qualitative data is represented as number and percentage and quantitative data represent by mean ± SD.

The following tests were used to test differences for significance; Differences between frequencies (qualitative variables) and percentages in groups were compared by Chi-square test. Significance of difference between mean done using parametric independent t test. P value was set at <0.05 for significant results & <0.001 for highly significant results.

The starting timeline of 1st and 2nd wave is taken as July-August 2020 and March-April 2021 as the number of daily new cases crossed 20,000.

#### Inclusion criteria:

All nine surgical specialties available in the hospital were included in the study:

ENT, Ophthalmology / Eye, orthopedic surgery, plastic surgery, uro surgery, burn and plastic surgery, neurosurgery

#### Exclusion criteria:

All non surgical specialties were excluded from the study.

### 4. Results

IPD	ENT	Eye	Gyn	Ortho	Plastic	Surgery	Uro Surgery	Burn + Plastic	Neuro +Trauma
(Apr' 18 - Mar' 20)									
Total	2612	5037	7249	2153	5977	1009	995	1923	5037
Mean ±SD	108.83±20.95	209.88 ±40.45	302.04 ±51.34	89.71 ±15.65	249.04±33.71	42.04±10.05	41.46±9.58	80.13±14.25	108.83±20.95
Min - Max	69-160	113-300	148-379	63-132	179-316	20-64	24-59	58-115	113-300
(Apr' 20- Mar' 21)									
Total	251	769	1553	719	1437	194	306	644	769
Mean ±SD	20.92±18.61	64.08±59.02	129.42 ±11.07	59.92 ±13.89	119.75±38.13	16.17 ±9.16	25.5±7.78	53.67±16.37	64.08±59.02
Min- Max	4-50	2-163	114-150	32-76	70-175	0-31	11-37	24-83	2-163
Drop (%)	90.39	84.73	78.58	66.6	75.96	80.77	69.25	66.51	84.73
P value (Man n - Whitney U test)	<0.0001 HS	<0.0001 HS	<0.0001 HS	<0.0001 HS	<0.0001 HS	<0.0001 HS	<0.0001 HS	<0.0001HS	<0.0001HS

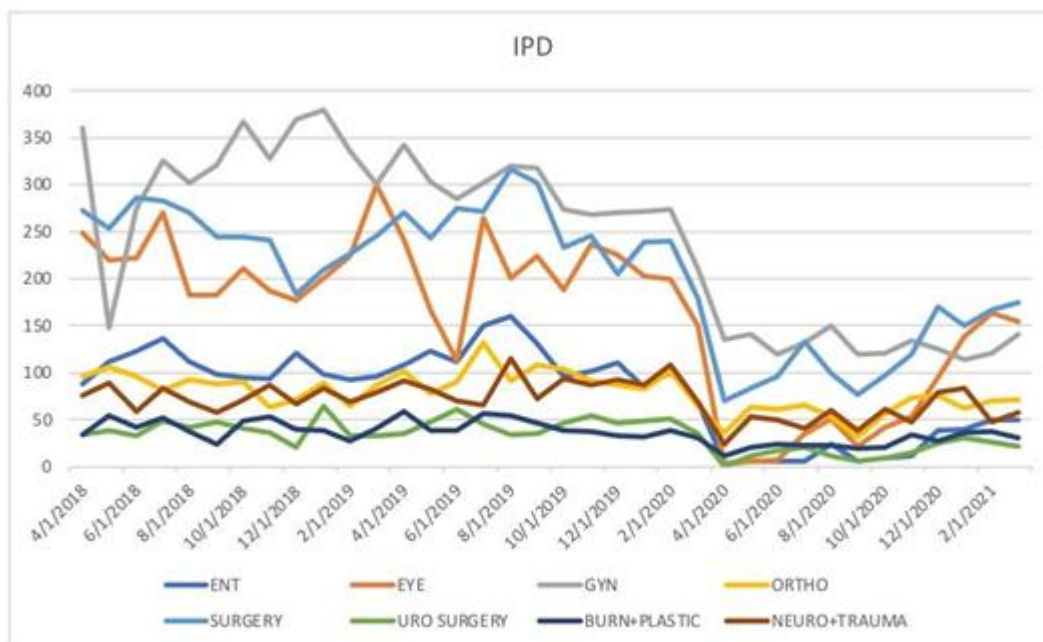


Figure 1: In patient admission data from April 2018 to March 2021 and its statistical analysis

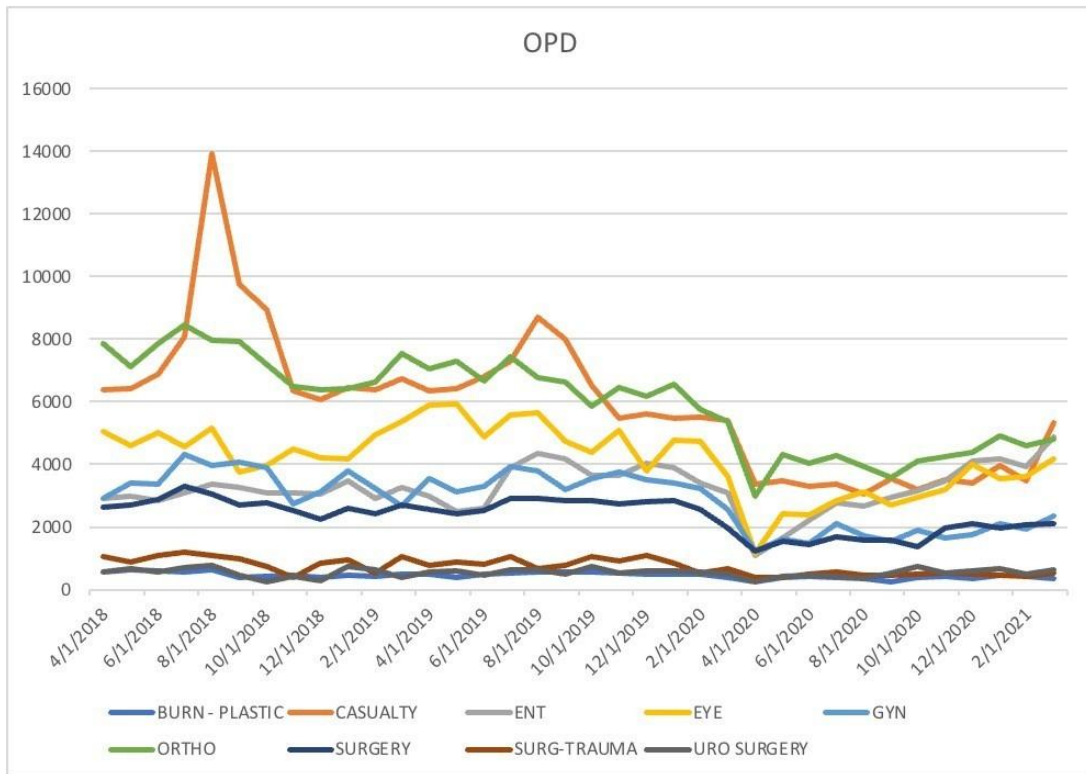


Figure 2: Out patient data from April 2018 to March 2021 and it's statistical analysis

OPD	Burn-Plastic	Casualty	Ent	Eye	Gyn	Ortho	Surgery	Surg-Trauma	Uro Surgery
<b>(Apr' 18 -Mar' 20)</b>									
Total	12053	169744	79443	114301	82382	165796	64494	20914	13392
Mean ±SD	502.21±75.53	7072.67±1862.2	3310.13±486.21	4762.54±649.1	3432.58±456.65	6908.17±778.4	2687.25±270.06	871.42±212.45	558±132.44
Min- Max	371-645	5385-13933	2493-4338	3596-5915	2556-4327	5359-8438	1969-339	384-127	248-775
<b>(Apr' 20 -Mar' 21)</b>									
Total	4452	43000	37005	36062	21394	50181	20639	5678	6106
Mean ±SD	371±60.07	3583.33±594.05	3083.75±1100.65	3005.17±816.32	1782.83±314.39	4181.75±523.91	1719.92±312.41	473.17±55.22	508.83±142.45
Min- Max	249-447	3053-5335	1098-4874	1156-4172	1227-2353	2987-4910	1212-2111	373-550	232-725
Drop (%)	<b>63.06</b>	<b>74.67</b>	<b>53.42</b>	<b>68.45</b>	<b>743</b>	<b>69.73</b>	<b>68</b>	<b>72.85</b>	54.41
P value (Man n-Whitney U test)	<0.0001HS	<0.0001HS	0.58NS	<0.0001HS	<0.0001HS	<0.0001HS	<0.0001HS	<0.0001HS	0.31NS

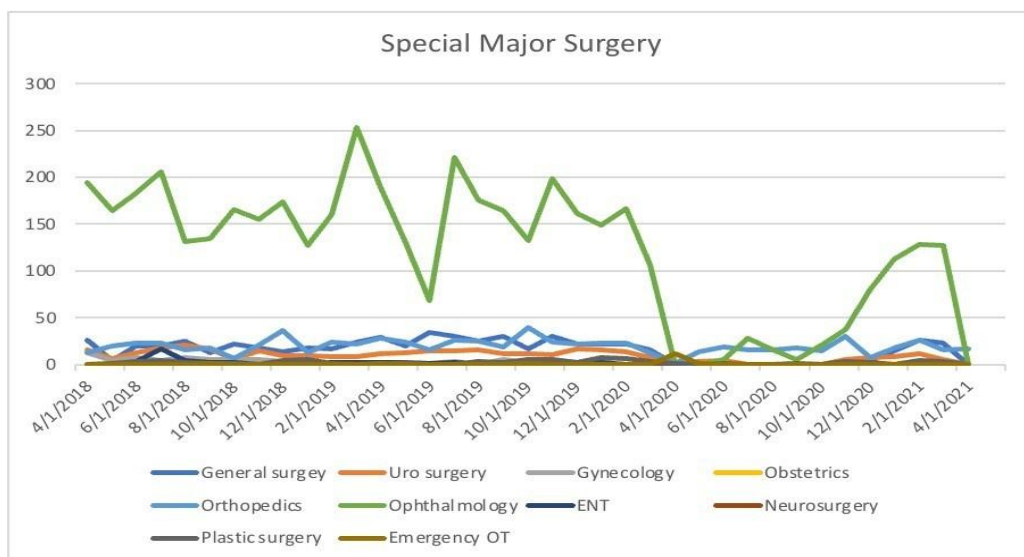


Figure 3: Number of special major surgeries done from April 2018 to April 2021 and it's statistical analysis

Special Major Surgery	General Surgery	Uro Surgery	Gynecology	Obstetrics	Orthopedic	Ophthalmology	ENT	Neuro Surgery	Plastic Surgery	Emergency OT
<b>(Apr' 18 -Mar' 20)</b>										
Total	518	311	70	0	519	3908	49	0	62	3
Mean ±SD	21.58±6.65	12.6±3.86	2.92±3.44		21.63±7.11	162.83±38.78	2.04±3.33		2.58±2.47	0.13±0.34
Min- Max	4-34	5-21	0-13	0-0	7-40	68-253	0-17	0-0	0-8	0-1
<b>(Apr' 20 -Apr' 21)</b>										
Total	69	48	0	0	214	563	3	0	15	13
Mean ±SD	5.31±9.77	3.69±4.2			16.46±7.42	43.31±50.82	0.23±0.62		1.15±1.42	1±3.45
Min- Max	0-26	0-12	0-0	0-0	1-30	0-128	0-2	0-0	0-4	0-12
<b>Drop (%)</b>	86.68	84.57	100		58.77	85.59	93.88		75.81	-333.33*
P value (Man n-Whitney U test)	<0.0001 HS	<0.0001 HS			0.046S	<0.0001 HS	<0.0001 HS		<0.0001 HS	<0.0001 HS

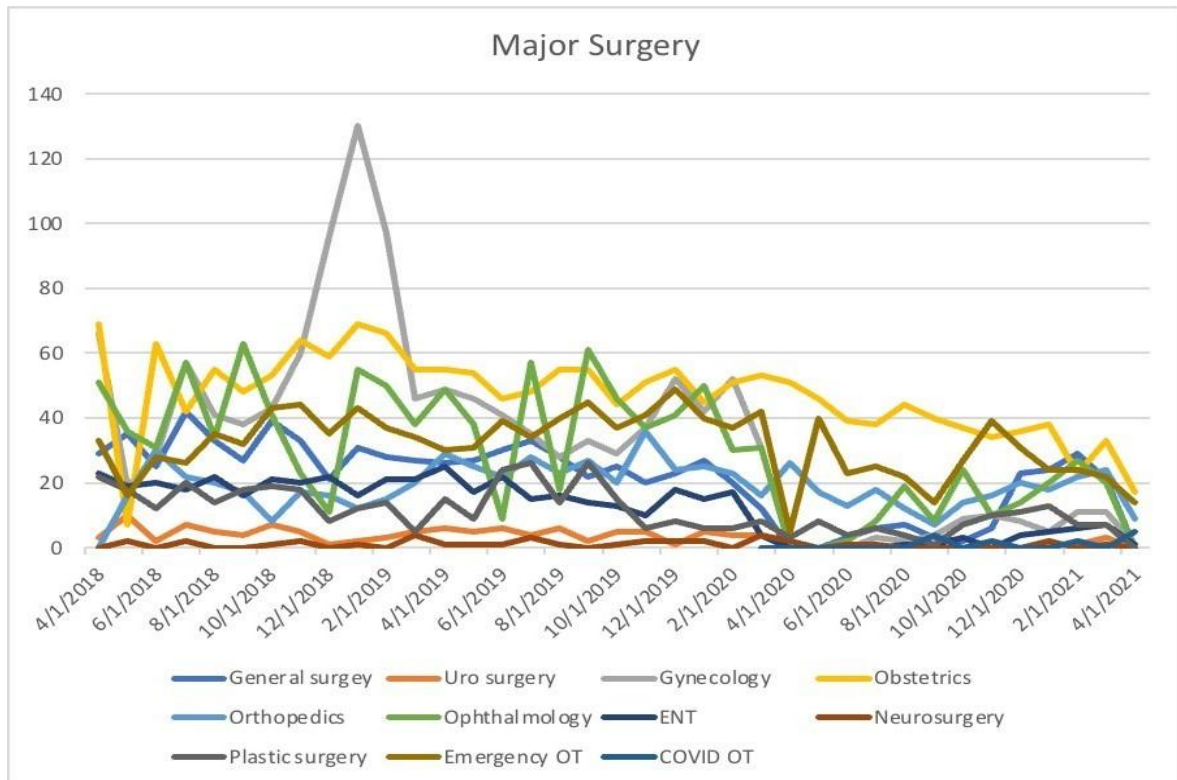


Figure 4: Number of major surgeries done from April 2018 to April 2021 and its statistical analysis

Major Surgery	General Surgery	Uro Surgery	Gynecology	Obstetrics	Orthopedic	Ophthalmology	ENT	Neuro Surgery	Plastic Surgery	Emergency OT	COVID OT
<b>(Apr' 18- Mar' 20)</b>											
Total	663	107	1196	1262	491	957	425	30	343	871	0
Mean ±SD	27.63±6.5	4.46±2.08	49.83±25.54	52.58±12.24	20.46±7.62	39.88±14.92	17.71±4.61	1.25±1.22	14.29±6.51	36.29±7.15	
Min- Max	12-42	1-10	19-130	7-69	0-36	9-63	4-25	0-4	5-26	16-49	0-0
<b>(Apr' 20- Apr' 21)</b>											
Total	124	5	64	476	216	152	28	7	81	310	13
Mean ±SD	9.54±10.65	0.38±0.9	4.92±4.37	36.62±7.03	16.62±5.36	11.69±9.38	2.15±2.63	0.54±0.79	6.23±3.47	23.85±9.56	1±1.3
Min- Max	0-29	0-3	0-11	17-51	7-26	0-27	0-7	0-2	0-13	5-40	0-5
<b>Drop (%)</b>	81.3	95.33	94.65	62.28	56.01	84.12	93.41	76.67	76.38	64.41	
P value (Man n-Whitney U test)	<0.0001 HS	<0.0001 HS	<0.0001 HS	<0.0001 HS	0.089NS	<0.0001 HS	<0.0001 HS		<0.0001 HS	<0.0001 HS	



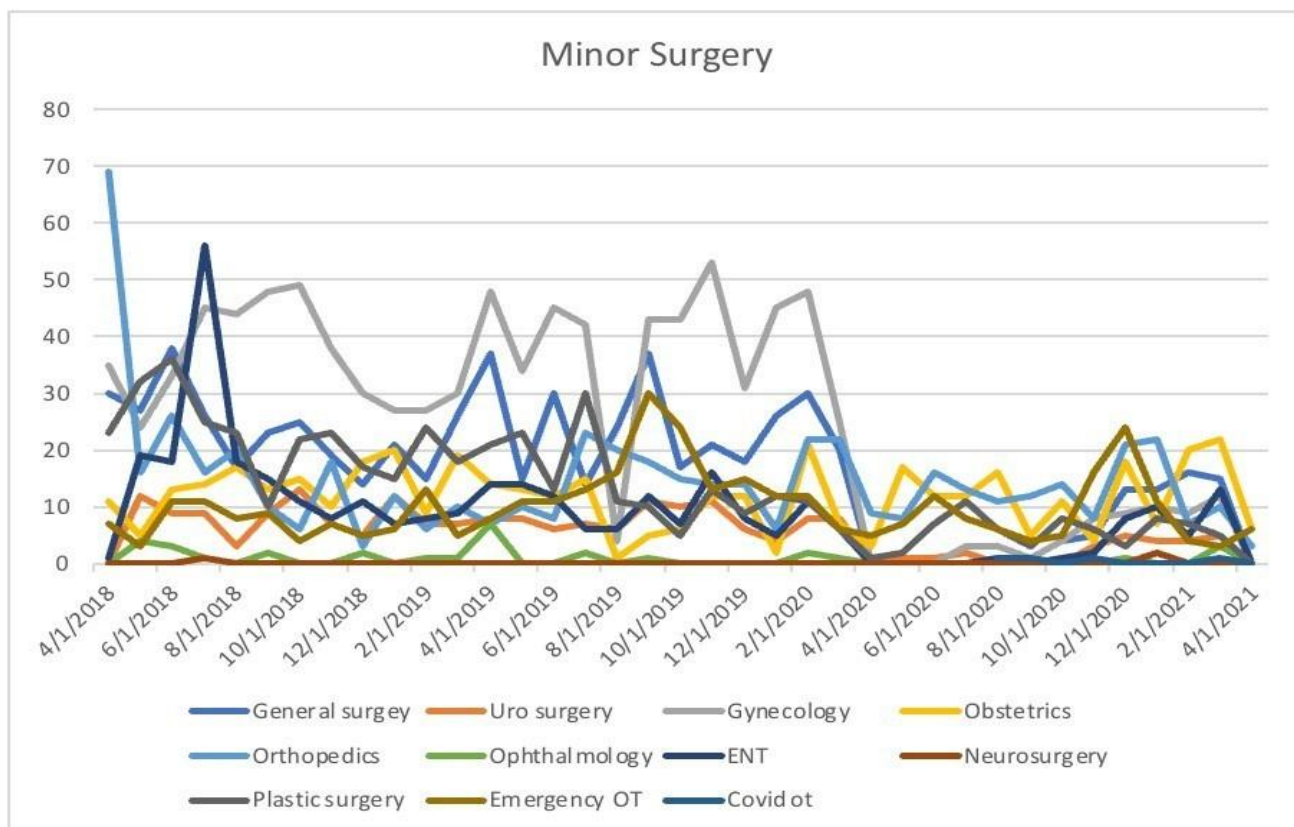


Figure 5: Number of minor surgeries done from 1st April 2018 to 1st April 2021 and its statistical analysis

Minor Surgery	General Surgery	Uro Surgery	Gynecology	Obstetrics	Orthopedic	Ophthalmology	ENT	Neuro Surgery	Plastic Surgery	Emergency OT
<b>(Apr' 18- Mar' 20)</b>										
Total	570	186	891	284	391	27	298	1	432	260
Mean ±SD	23.75± 7.28	7.75± 3.03	37.13± 11.16	11.83± 5.43	16.29 ±12.88	1.13± 1.68	12.42 ±10.37	0.04± 0.2	18± 8.31	10.83± 6.16
Min- Max	14-38	0-13	4-53	1-21	3-69	0-7	1-56	0-1	5- 36	3-30
<b>(Apr' 20- Apr' 21)</b>										
Total	73	25	59	153	154	5	40	2	67	111
Mean ±SD	5.62± 6.29	1.92± 2.02	4.54± 4.42	11.77± 6.47	11.85± 4.94	0.38± 0.9	3.08± 4.58	0.15 ±0.58	5.15± 2.91	8.54± 6.17
Min- Max	0-16	0-5	0-12	3-22	3-22	0-3	0-13	0-2	0- 11	3-24
<b>Drop (%)</b>	87.19	86.56	93.38	46.13	60.61	81.48	86.58	-100	84.49	57.31
P value (Man n-Whitney U test)	<0.0001 HS	<0.0001 HS	<0.0001 HS	0.92NS	0.28NS	0.15 NS	0.002 HS	0.86NS	<0.0001 HS	0.13 NS

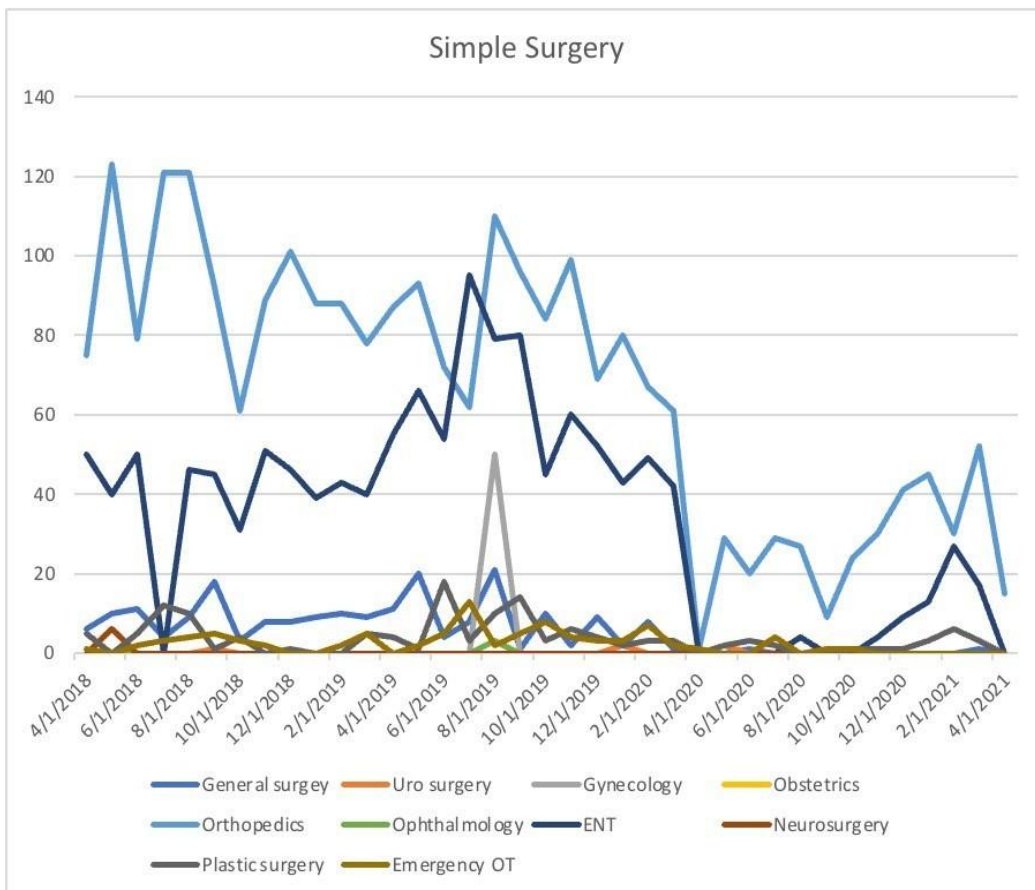
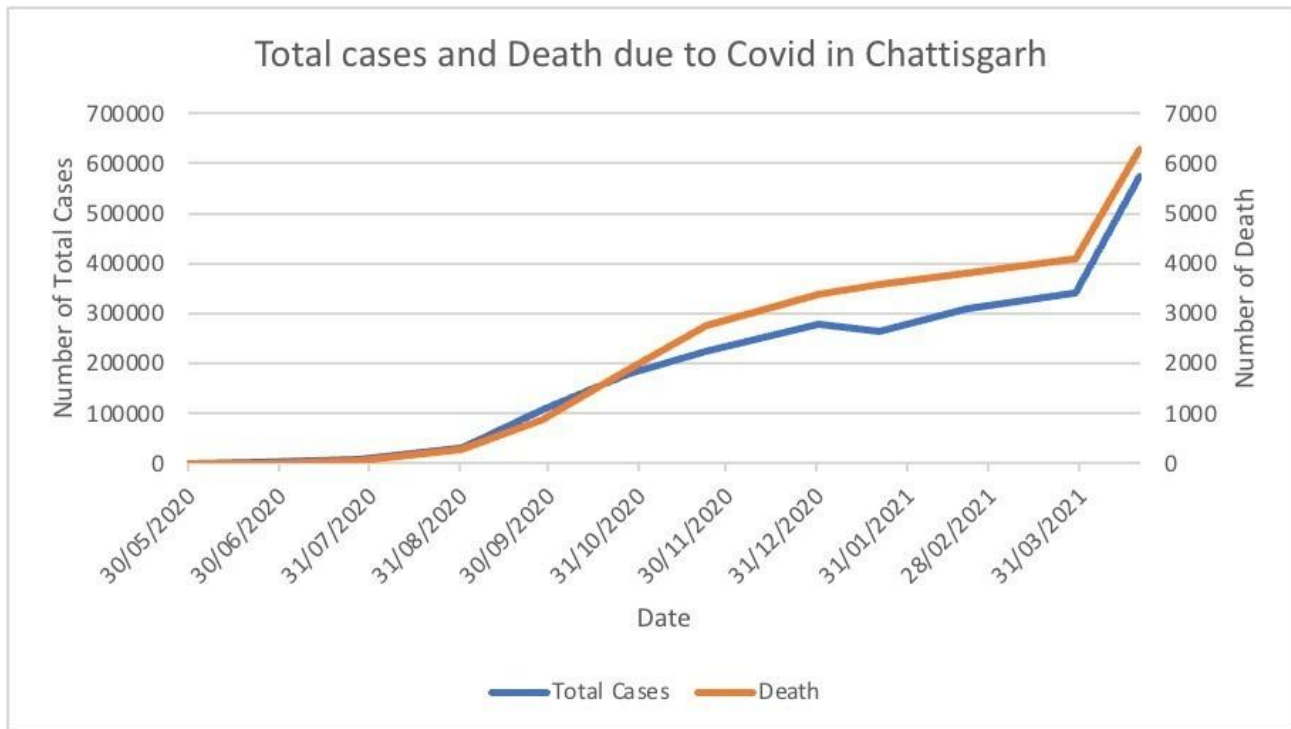


Figure 6: Number of simple surgery from April 2018 to April 2021 and it's statistical analysis

Simple Surgery	General surgery	Uro surgery	Gynecology	Obstetrics	Orthopedics	Ophthalmology	ENT	Neuro surgery	Plastic surgery	Emergency OT
(Apr' 18 – Mar' 20)										
Total	518	311	70	0	519	3908	49	0	62	3
Mean ±SD	21.58±6.65	12.96 ±3.86	2.92 ±3.44		21.63±7.11	162.83±38.78	2.04±3.33		2.58±2.47	0.13±0.34
Min - Max	4-34	5-21	0-13	0-0	7-40	68-253	0-17		0-8	0-1
(Apr' 20- Mar' 21)										
Total	69	48	0	0	213	563	3	0	14	1
Mean ±SD	5.75±9.77	4±4.2			17.75 ±5.61	46.92 ±50.8	0.25 ±0.62		1.17 ±1.47	0.08 ±0.29
Min- Max	0-26	0-12	0-0	0-0	8-30	0-128	0-2	0-0	0-4	0-1
Drop (%)	86.68	84.57	100		58.95	85.59	93.8		77.42	66.67
P value (Man n - Whitney U test)	<0.0001 HS	<0.0001 HS			0.046 HS	<0.0001 HS	0.0006 HS		0.09NS	0.86NS



**Figure 7:** Total cases and death in Chhattisgarh from 30th May 2020 to 31st March 2021

As shown in figure 1 there is highly significant decrease seen in in-patient admissions in all nine surgical departments.

Compared to 1st wave significant increase in patient admissions is seen in ENT (3.89%), ophthalmology (12.67%) and significant decrease was seen in gynecology (10.3%) and neurosurgery (2.62%)

As shown in figure 2 there is highly significant decrease seen in outpatient department in all surgical departments except ENT (53.42%) and urosurgery (54.41%).

Non-significant decrease was seen in ENT (53.42%) and urosurgery (54.41%)

Compared to 1st wave significant increase was seen in Casualty (3.21%), ENT (4.12%), urosurgery (0.41%)

Compare to 1st wave significant decrease in OPD was seen in burn-plastic (6.73%), Gyne-obs (1.43%), orthopedics (3.91%), Surgery (0.79%) and neurosurgery (0.76%)

As shown in figure 3 there is highly significant decrease seen in special major surgery in general surgery (86.68%), urosurgery (84.57%), ophthalmology (85.59%), ENT (93.88%), plastic (75.81%) and significant decrease in orthopedics (58.77%)

Compare to 1st wave significant increase was seen in special major surgery in general surgery (11.86%), urosurgery (3.09%); Significant decrease was seen in orthopedics (25.1%)

As shown in figure 4 highly significant decrease in major surgery was seen in general surgery (81.33%), urosurgery (95.33%), gynecology (94.65%), obstetrics (62.28%),

ophthalmology (84.12%), ENT (93.4%), plastic (76.38%) and emergency surgery (64.41%).

Non significant decrease was seen in Orthopedics (56.01%).

Compared to 1st wave significant increase was seen in ENT (3.16%), covid infected patients major operations (2.55%) but significant decrease was seen in obstetrics (5.41%).

As shown in figure 5 there is highly significant decrease in minor surgery seen in general surgery (87.19%), urosurgery (86.56%), Gynecology (93.38%), ENT (86.5%), plastic (84.49%).

Non - significant decrease in minor surgery was seen in obstetrics (46.13%), orthopedics (60.61%), ophthalmology (81.48%), emergency surgery (57.31%).

Non - significant increase was seen in neuro surgery (100%)

Compared to 1st wave significant increase was seen in ENT (11.49%) and significant decrease was seen in orthopedics (11.74%) and plastic (12.36%).

As shown in figure 6 highly significant decrease in simple surgery is seen in general surgery (86.68%), urosurgery (84.57%), orthopedics (58.96%), ophthalmology (85.59%), ENT (93.88%). Non significant decrease in simple surgery seen in plastic surgery (77.42%) and emergency surgery (66.67%).

Compare to 1st wave significant decrease in simple surgery was seen in orthopedics (25.1%).

## 5. Discussion

Despite a statewide lockdown that was imposed on 6 April, there has been no decrease in COVID-19 cases. Chhattisgarh government data reveals that daily cases in Durg have almost doubled in April alone, climbing from 996 on 1 April to 1,778 on 15 April (9).

In the mean time IPD admissions decreased in all nine surgical specialties although compared to 1st wave significant increase in patient admissions is seen in ENT, ophthalmology and significant decrease was seen in gynecology, obstetrics and neurosurgery.

Highly significant decrease was seen in outpatient department in all surgical departments except ENT and urosurgery. Non-significant decrease was seen in ENT and urosurgery. Compared to 1st wave significant increase was seen in Casualty, ENT, urosurgery but significant decrease in OPD attendance was seen in burn and plastic surgery, Gynecology and obstetrics, orthopedics, Surgery and neurosurgery.

Highly significant decrease was seen in special major surgery in general surgery, urosurgery, ophthalmology, ENT, plastic and significant decrease in orthopedics. Compared to 1st wave significant increase was seen in special major surgery in general surgery, urosurgery; Significant decrease was seen in orthopedics.

Highly significant decrease in major surgery was seen in general surgery, urosurgery, gynecology, obstetrics, ophthalmology, ENT, plastic and emergency surgery. Non significant decrease was seen in Orthopedics. Compared to 1st wave significant increase was seen in ENT, covid infected patients major operations but significant decrease was seen in obstetrics.

Highly significant decrease in minor surgery seen in general surgery, urosurgery, Gynecology, ENT, plastic. Non-significant decrease in minor surgery was seen in obstetrics, orthopedics, ophthalmology, emergency surgery. Non-significant increase was seen in neuro surgery. Compared to 1st wave significant increase was seen in ENT and significant decrease was seen in orthopedics and plastic. As shown in figure 6 highly significant decrease in simple surgery is seen in general surgery, urosurgery, orthopedics, ophthalmology, ENT. Non significant decrease in simple surgery seen in plastic surgery and emergency surgery. Compare to 1st wave significant decrease in simple surgery was seen in orthopedics.

Due to the strict lockdown OPD attendance, IPD admissions and all 4 types (special major, major, minor, simple) of surgeries reduced in number.

As time progressed some fields did make some recovery but not upto the pre pandemic levels. All aspects of surgical care suffered due to the ongoing pandemic.

## 6. Conclusion

As can be interpreted from the above data all surgical departments saw reduced number in all aspects of surgical care as all available resources were diverted to covid infected patient care and partly owing to the ongoing strict lockdown to limit spread of infection. Unlike the starting period of pandemic as time progressed the number of covid infected patients receiving surgical care during active infection period increased indicating towards better protocols of covid infected patient's surgical management.

## 7. Acknowledgement

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## 8. Abbreviations

IPD: In patient department

OPD: outpatient department

JLNHRC: Jawaharlal Nehru Hospital and Research Centre

ENT: Ear, nose, throat

## 9. Conflicts of interest

All authors certify that they have no affiliations with or involvement in any organisation or entity with any financial interest or nonfinancial interest in the subject matter or materials discussed in this manuscript.

## 10. Funding

No funding was received from any external source

## 11. Ethical approval

Ethical approval was obtained our hospital's ethical review committee.

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