Impact of COVID-19 on surgical procedural utilization

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BACKGROUND

Beginning of COVID-19 pandemic, in March-April 2020, led to a significant stress on healthcare systems. Governments, health systems and patients took actions to restrict/defer/cancel procedures to allocate resources for treating COVID patients. While the impact was on whole system, elective procedures were more prone to cancellation comparing to urgent procedures that are essential to the survival of patients.

HYPOTHESIS

Elective procedures would be impacted much more than relatively non-elective procedures at the beginning of the pandemic

METHOD

Procedures in Interests:

Elective	Non-elective
Bariatric	Colorectal (cancer)
Hysterectomy	Lung lobectomy (cancer)
Simple hernia repair	Complex hernia repair

Premier database:

- A medical billing and cost data vendor
- Time frame: 2019 – 2021
- Include 775 hospitals across the U.S.
- De-identified and compliant with the Health Insurance Portability and Accountability Act (HIPAA)

METHOD

Procedure volume recovery rate:

- Pre-COVID Baseline: 2019, Follow-up: 2020 - 2021

$$Recovery\ Rate_{(month)} = \frac{Followup\ Volume_{(month)}}{Baseline\ Volume_{(month)}} \times 100\ (\%)$$

SAS statistical software:

- Used for data extraction and calculation

Consistent contributors

- Hospitals that constantly contributed data across the time frame in the analysis
- Ensure comparable results

Table 1. Provider characteristics.

	Provider N = 775
Teaching Hospital	31.7%
Urban Hospital	74.7%
Bed Size	
< 100	22.0%
100-299	42.1%
300+	35.9%
Provider Division	
EAST NORTH CENTRAL	19.8%
EAST SOUTH CENTRAL	8.3%
MIDDLE ATLANTIC	10.2%
MOUNTAIN	6.1%
NEW ENGLAND	1.8%
PACIFIC	10.4%
SOUTH ATLANTIC	23.9%
WEST NORTH CENTRAL	7.2%
WEST SOUTH CENTRAL	12.4%

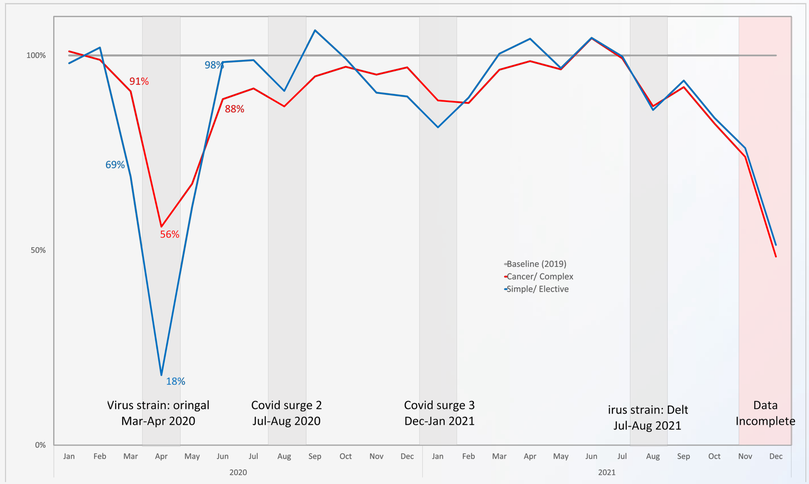


Figure 1. Procedure volume recovery trend by cancer/complex and simple/elective type (baseline: 2019).

RESULTS

- Both elective and non-elective procedure volumes showed a significant dip when the pandemic started in March 2020 and hit the bottom in April 2020
- Elective procedures saw a greater dip (69% and 18% of the baseline volumes in March and April 2020) than non-elective procedures (91% and 56%, respectively) (Figure 1)
- Thereafter, elective procedure volumes recovered to baseline levels in June 2020 (98%). Non-elective procedure volumes showed a slower recovery as they were at 88% in June 2020.
- In addition to elective and non-elective procedure comparisons, the payor mix showed that Medicaid population had slightly better recovery in 2020 (88%) vs Medicare and Commercial populations (83%)
- It is more obvious in 2021 that Medicaid population had higher recovery than other payors and even exceeded pre-COVID level (Table 2)
- Moreover, minimally invasive surgical approach demonstrated better recovery from the COVID-19 impact comparing to open approach (Table 3)

Table 2. Procedure volume recovery by payors (baseline: 2019).

	Year	
Payor	**2020**	**2021**
MEDICARE	83.1%	87.1%
MEDICAID	88.2%	101.2%
COMMERCIAL	83.3%	90.4%
OTHER	86.8%	93.7%

Table 3. Procedure volume recovery by procedure approach (baseline: 2019).

	Year	
Approach	**2020**	**2021**
MIS	86.4%	97.7%
OPEN	80.1%	79.2%

CONCLUSION

Non-elective (cancer, complex) procedures showed lower rate of cancelations at the beginning phase of the pandemic than the elective procedures. As the pandemic continued, we noticed that elective procedures recovered faster than non-elective procedures.