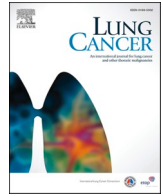




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Letter to the Editor

How much have covid-19 pandemic waves impacted the number of lung cancer surgeries

ARTICLE INFO

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The emergence of the covid-19 pandemic had a disruptive effect on health services worldwide. As more resources were needed to face the epidemiologic threat, even non-elective services suffered a reduction in funding and capacity. Lung cancer care has been affected by this health crisis. Studies have shown a reduction in the diagnosis of this disease after the pandemic's onset and a significant decrease in lung cancer screening [1,2]. The low-dose computed tomography (LDCT) performance rate among Medicare beneficiaries in the United States of America was 24% (95% CI, 23%–24%) lower than expected between March 2020 and February 2021. Even considering the period between March 2021 and February 2022 – i.e., a most distant phase of the initial disruption of health services due to the pandemic –, the LDCT performance rates remained lower than expected [3]. A population-based study in Ontario, Canada, indicated that the weekly incidence of lung cancer reduced immediately after the onset of the pandemic (in March 2020) and this rate continued to decline until at least September 2020 – the final period of the study. Between March and September 2020, the study estimated that approximately 870 lung cancer cases were undiagnosed in this province [4].

In Brazil, Federal Law N. 12,732/2012 stipulates that cancer patients have the right to begin treatment within up to two months of diagnosis [5]. We used data from the Ministry of Health (System of Hospital Information: <https://datasus.saude.gov.br/transferecia-de-arquivos/>) from 2018 to 2022 to assess whether the pandemic impacted the number of lung cancer surgeries carried out by the Brazilian Unified Health System – the public and universal health system of Brazil. We presented the comparison between the periods under analysis (pre-pandemic and the different phases of the pandemic period) as a percentage of variation, obtained by the equation: $[(\text{number of surgeries in the period} / \text{number of surgeries in the immediately preceding period}) - 1] * 100$.

This period's most frequent surgery types were segmentectomy, lobectomy, tumorectomy, and wedge resection. Overall, lung cancer surgeries were reduced by 22.2% during the first pandemic wave; this

number nearly doubled in the country's poorer regions, the North and Northeast. As the subsequent pandemic waves emerged, lung cancer surgeries reduced even further, even though a complete recovery of cancer surgeries did not meet the previous receding of covid-19 cases and deaths. This observation holds for the country as a whole and each of its macro-regions. It also holds for Sao Paulo, the wealthiest Brazilian state, and Sao Paulo city, its largest metropolis (Table 1). In the third pandemic wave, a recovery to pre-pandemic levels seems to be taking shape (Fig. 1). However, considering the reductions in previous phases, this resumption in surgical production may partially reflect the assistance to repressed demands; it may be reckless to state that there is a return to normality. In addition, further investigations are necessary to understand whether chest CT scans indicated for certain suspected/confirmed cases of Covid-19 [6] have resulted in incidental lung cancer diagnoses.

Lung cancer has a poor prognosis and low survival rates [7]. We fear many other countries and cities may have faced an analogous situation during the pandemic, thus inducing an increase in cancer mortality in the short and mid-term. Cancer cannot wait for covid-19; lung cancer surgeries are not elective.

We urge the professional field to assess the temporal relationship of lung cancer treatments across covid-19 phases both locally and regionally. Health surveillance is critical to uncover the problem; documenting it is an initial step toward its solution. Systematic and continuous data gathering and analysis of healthcare provision and utilization are instrumental in providing information to instruct health policy and planning.

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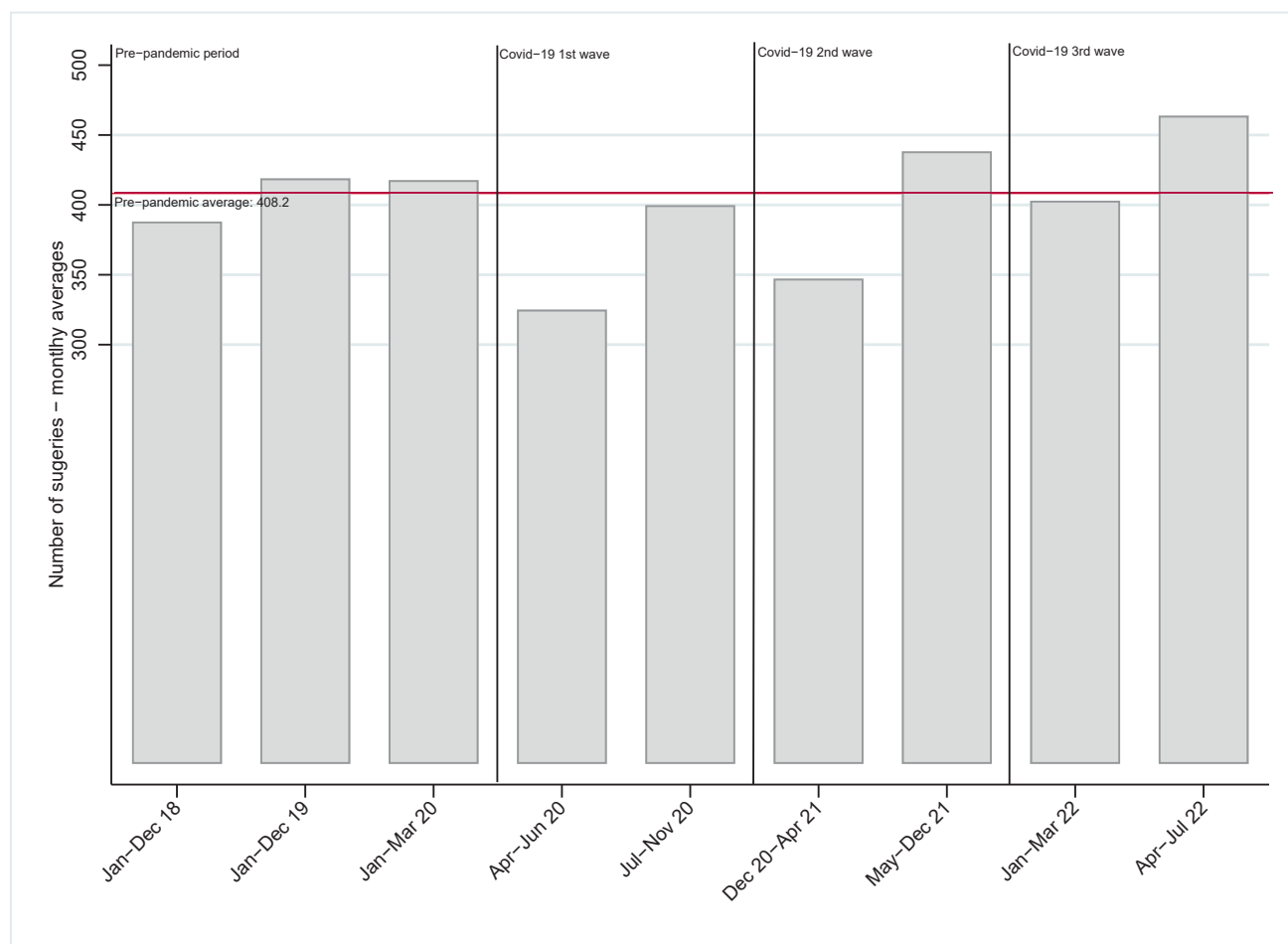
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Table 1

Surgeries in patients with lung cancer (C33-34 ICD10 codes) across covid-19 pandemic periods. Brazil National Health System, monthly averages, 2018–22.

Period	All Country	North Region	Northeast Region	Southeast Region	South Region	C. West Region	São Paulo State	São Paulo City
Pre-pandemic								
Jan-Dec 2018	388.1	10.7	84.8	154.0	122.2	16.4	83.8	26.5
Jan-Dec 2019	418.9	11.3	97.7	169.5	124.7	15.8	92.6	27.6
Jan-Mar 2020	417.7	11.0	93.0	171.3	119.7	22.7	92.7	28.3
Covid-19 1st wave								
Apr-Jun 2020	325.0	5.3	55.7	134.7	110.0	19.3	71.0	15.0
Percent variation (1)	-22.2%	-51.5%	-40.1%	-21.4%	-8.1%	-14.7%	-23.4%	-47.1%
Jul-Nov 2020	399.8	14.0	86.2	167.2	113.8	18.6	81.0	21.8
Covid-19 2nd wave								
Dec 2020-Apr 2021	347.2	8.2	87.0	138.2	92.2	21.6	68.8	18.2
Percent variation (1)	-13.2%	-41.4%	+1.0%	-17.3%	-19.0%	+16.1%	-15.1%	-16.5%
May-Dec 2021	438.3	9.9	97.1	182.1	120.8	28.4	92.1	27.5
Covid-19 3rd wave								
Jan-Mar 2022	403.0	12.7	82.7	168.0	117.7	22.0	87.7	20.7
Percent variation (1)	-8.0%	+28.3%	-14.9%	-7.8%	-2.6%	-22.5%	-4.8%	-24.8%
Apr-Jul 2022	463.8	14.5	101.5	184.8	139.3	23.8	91.8	15.5

(1) Percent variation of the number of surgeries during the beginning of each pandemic wave compared to the immediately preceding period.

**Fig. 1.** Surgeries in patients with lung cancer (C33-34 ICD10 codes) across covid-19 pandemic periods in Brazil. Brazil National Health System, monthly averages, 2018–22. Footnote: Red line indicates the average of pre-pandemic periods (Jan-Dec 2018, Jan-Dec 2019, Jan-Mar 2020). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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