



## Lung cancer in the era of COVID-19: what can we expect?

Jose de Arimateia Batista Araujo-Filho<sup>1,2</sup>, Paulo Garcia Normando<sup>3</sup>,  
Marcelo Dantas Tavares de Melo<sup>3</sup>, André Nathan Costa<sup>1,2</sup>,  
Ricardo Mingarini Terra<sup>1,4</sup>

### TO THE EDITOR,

In Brazil, lung cancer is the most lethal malignant neoplasm and the third most common type of cancer among males;<sup>(1,2)</sup> it is also associated with high morbidity and mortality despite recent advances in its treatment. It is estimated that 70% of all cases of lung cancer in the country are diagnosed in an advanced or metastatic stage (stages III and IV, respectively), whereas less than 9% are diagnosed in stage I, a lower proportion than what has been reported for some high-income countries.<sup>(3)</sup> We know that delays in diagnosing the disease can lead to adverse outcomes (such as rapid progression of the disease and death), which could be partially related to the limited availability of diagnostic procedures such as biopsy (percutaneous or surgical), mediastinoscopies, and bronchoscopies in our public health care system.<sup>(4)</sup> In recent years, the delay in diagnosis has been one of the main challenges faced in the management of lung cancer patients in Brazil.<sup>(2)</sup>

More recently, the COVID-19 pandemic has imposed new logistical challenges to the Brazilian health care system in dealing with the staggering volume of infected patients who need hospitalization. In an attempt to reduce the spread of the disease, consultations and emergency care were initially limited, which made managing other pathologies a challenging task for physicians and patients. In addition, the immediate suspension of elective and surgical procedures, including various oncological procedures, as well as prioritized reallocation of available financial resources, has contributed to making this the largest public health crisis in recent history.

Population-based studies evaluating the impact of the current pandemic on the clinical oncology practice have registered delays in the management of various types of cancer, including lung cancer,<sup>(5-7)</sup> which could lead to an increase in the number of avoidable cancer-related deaths in the near future. One of those studies highlighted a special concern in relation to younger patients, in whom the risk of nosocomial infection during hospitalization does not justify any delay in the treatment, even if only for a few weeks.<sup>(6)</sup> To our knowledge, despite growing concern in the international medical and scientific community on the subject, there have been no studies of this nature conducted in Brazil.

From the epidemiological data available on the information platforms of the Brazilian *Sistema Único de*

*Saúde* (SUS, Unified Health Care System),<sup>(8,9)</sup> we made an observational analysis of the number of hospitalizations and interventional diagnostic procedures (percutaneous or surgical lung biopsies and bronchoscopies) related to lung neoplasms (ICD-10 codes C33-C34) performed at outpatient clinics and hospitals between March and May of 2020. For the comparative analysis, we used as a reference the values obtained for the same period in 2019 and the values projected for the current year by linear regression of a time series for the same period in each year from 2016 to 2019 (Figure 1). That analysis revealed that the number of hospitalizations per pulmonary neoplasm (in the trachea, bronchi, or lungs) during the period evaluated in 2020 was 7% smaller than for the same period in 2019 (6,106 vs. 6,601) and differed significantly from the estimated number (6,879;  $p = 0.02$ ). In the same period of comparative analysis, the numbers of lung biopsies and bronchoscopies performed in the SUS diminished 13% (1,219 biopsies in 2020 vs. 1,399 in 2019) and 35% (6,423 bronchoscopies in 2020 vs. 9,952 bronchoscopies in 2019), respectively, the difference in relation to the number of bronchoscopies projected for 2020 being statistically significant ( $p = 0.002$ ). This abrupt decline in the number of bronchoscopies can be explained by the fact that the procedure potentially presents a high risk of contaminating the care staff, which explains the the *Sociedade Brasileira de Pneumologia e Tisiologia* recommendation to suspend elective procedures during March of 2020.

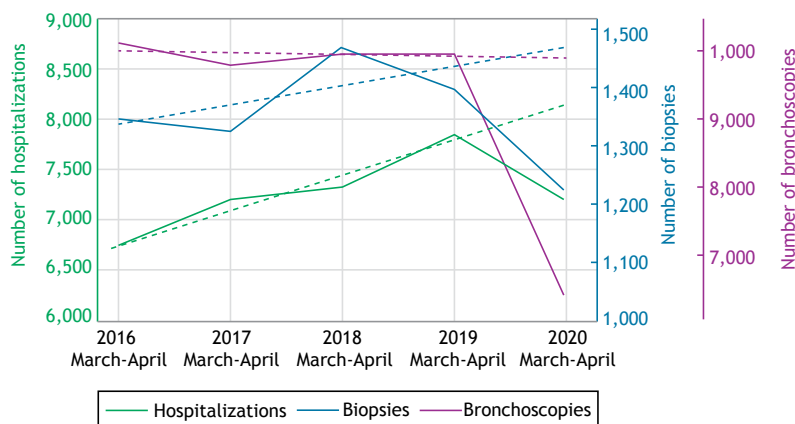
The data presented here should be interpreted with caution, especially given the observational nature of our analysis and the short period of time evaluated. It is unknown how the health care system will deal with the patient flow returning to pre-pandemic levels, especially if we consider the likely overload caused by the backlog of demand for health care appointments. However, these data underscore the urgent need to discuss actions directed toward maintaining a prioritized, organized flow of patients with a suspected or confirmed diagnosis of lung cancer. This would involve not only raising the awareness of the population at risk (mainly heavy smokers) of the need for screening programs but also combating the uncertainty and panic that can impede the proper treatment of some patients during the pandemic. In addition, reliable epidemiological data and scientific evidence should guide the planning of

1. Hospital Sírio-Libanês, São Paulo (SP) Brasil.

2. Instituto do Coração – InCor – Hospital das Clínicas, Faculdade de Medicina, Universidade de São Paulo, São Paulo (SP) Brasil.

3. Faculdade de Medicina, Universidade Federal da Paraíba, João Pessoa (PB) Brasil.

4. Instituto do Câncer do Estado de São Paulo – ICESP – Hospital das Clínicas, Faculdade de Medicina, Universidade de São Paulo, São Paulo (SP) Brasil.



**Figure 1.** Comparative analysis of the number of hospitalizations related to lung cancer, the number of lung biopsies, and the number of bronchoscopies performed via the Brazilian Unified Health Care System between March and April over the last five years. The dashed lines represent the trends projected by linear regression based on time series for the previous years.

public health programs focused on this new reality. After a larger amount of data has been amassed, it will be necessary to conduct further studies, involving longer clinical follow-up and new mortality correlations.

### AUTHOR CONTRIBUTIONS

All of the authors contributed equally to the conception of the study, as well as to the drafting, revision, and approval of the manuscript.

### REFERENCES

1. Brasil. Ministério da Saúde. Instituto Nacional de Câncer José Alencar Gomes da Silva (INCA) [homepage on the Internet]. Rio de Janeiro: INCA; c2019 [cited 2020 Aug 1]. Estimativa 2020: incidência de câncer no Brasil. [Adobe Acrobat document, 122p.]. Available from: <https://www.inca.gov.br/sites/ufu.sti.inca.local/files/media/document/estimativa-2020-incidencia-de-cancer-no-brasil.pdf>
2. Mathias C, Prado GF, Mascarenhas E, Ugalde PA, Gelatti ACZ, Carvalho ES, et al. Lung Cancer in Brazil. *J Thorac Oncol.* 2020;15(2):170-175. <https://doi.org/10.1016/j.jtho.2019.07.028>
3. Araujo LH, Baldotto C, Castro G Jr, Katz A, Ferreira CG, Mathias C, et al. Lung cancer in Brazil. *J Bras Pneumol.* 2018;44(1):55-64. <https://doi.org/10.1590/s1806-37562017000000135>
4. Tsukazan MTR, Terra RM, Detterbeck F, Santoro IL, Hochegger B, Meirelles GSP, et al. Management of lung nodules in Brazil—assessment of realities, beliefs and attitudes: a study by the Brazilian Society of Thoracic Surgery (SBCT), the Brazilian Thoracic Society (SBPT) and the Brazilian College of Radiology (CBR). *J Thorac Dis.* 2018;10(5):2849-2856. <https://doi.org/10.21037/jtd.2018.05.23>
5. Maringe C, Spicer J, Morris M, Purushotham A, Nolte E, Sullivan R, et al. The impact of the COVID-19 pandemic on cancer deaths due to delays in diagnosis in England, UK: a national, population-based, modelling study. *Lancet Oncol.* 2020;21(8):1023-1034. [https://doi.org/10.1016/S1470-2045\(20\)30388-0](https://doi.org/10.1016/S1470-2045(20)30388-0)
6. Sud A, Torr B, Jones ME, Broggio J, Scott S, Loveday C, et al. Effect of delays in the 2-week-wait cancer referral pathway during the COVID-19 pandemic on cancer survival in the UK: a modelling study. *Lancet Oncol.* 2020;21(8):1035-1044. [https://doi.org/10.1016/S1470-2045\(20\)30392-2](https://doi.org/10.1016/S1470-2045(20)30392-2)
7. Sud A, Jones ME, Broggio J, Loveday C, Torr B, Garrett A, et al. Collateral damage: the impact on outcomes from cancer surgery of the COVID-19 pandemic. *Ann Oncol.* 2020;31(8):1065-1074. <https://doi.org/10.1016/j.annonc.2020.05.009>
8. Brasil. Ministério da Saúde. Departamento de Informática do SUS (DATASUS) [homepage on the Internet]. Brasília: Ministério da Saúde; c2020 [cited 2020 Jul 31]. Sistema de Informação Hospitalar Descentralizado. Available from: <http://sihd.datasus.gov.br/>
9. Brasil. Ministério da Saúde. Departamento de Informática do SUS (DATASUS) [homepage on the Internet]. Brasília: Ministério da Saúde; c2020 [cited 2020 Jul 31]. Sistema de Informações Ambulatoriais de Saúde (SIASUS). Available from: <http://sia.datasus.gov.br/>