




The impact of the COVID-19 pandemic on oral biopsies in the Brazilian National Health System

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The COVID-19 pandemic is profoundly impacting health systems around the world. Since January 2020, the need to ensure care for cases of the new disease and to contain contagion has resulted in restrictions to healthcare provision (Remuzzi & Remuzzi, 2020). The fear of being exposed to contamination by the new coronavirus may also have led individuals to avoid seeking for health care, even facing symptoms that should not be neglected (Olmo, Martínez, Ramos, Maroto, & Diaz, 2020). Up until now, the healthcare community concentrated its efforts in the development of biosafety protocols (Centers for Disease Control & Prevention, 2020; Volgenant, Persoon, de Ruijter, & de Soet, 2020), definition of what constitutes elective care during the pandemic (American Dental Association, 2020), and use of alternatives to traditional, “in office” care, such as telehealth (Smith et al., 2020; Wosik et al., 2020). Nevertheless, all these initiatives may not be sufficient to guarantee that the health systems worldwide provide timely care to all diseases, while it is struggling to contain and treat COVID-19.

The diagnosis of oral cancer in early stages is one of the most critical factors related to the patient's survival (Dantas et al., 2016) and to the severity of mutilation that the individual can experience as part of surgical treatment. An incisional biopsy with histological assessment is the standard procedure for diagnosing oral cancer (Macey et al., 2015). The American Dental Association (ADA) indicates that biopsies of abnormal tissues of the mouth constitute urgent dental care, being a condition that requires immediate attention (American Dental Association, 2020). In this scenario, we aimed to document the impact of the new coronavirus pandemic on the number of biopsies in the soft tissues of the mouth performed

in Brazil's National Health System, the Sistema Único de Saúde (SUS).

SUS classifies biopsies of the soft tissue of the mouth as a medium complexity procedure, which can be executed on an outpatient or hospital service by physicians or dentists (Ministry of Health of Brazil, 2020a). In 2019, SUS performed 23,110 mouth biopsies; to have a dimension of this amount, 15,210 new cases of oral cancer are estimated for the country for 2020 (Ministry of Health of Brazil, 2020b). SUS's Ambulatory Information System (SIA-SUS) collects data about medium complexity procedures all over the country and makes information available anonymously and publicly. The number of biopsies in the soft tissues of the mouth (ICD-10 codes C00-C06) during the initial months of the COVID-19 pandemic in Brazil—from March to May of 2020—was retrieved from SIA-SUS; data from May were the latest available when this analysis was carried out. Data on biopsies carried out between March and May of 2016, 2017, 2018, and 2019 were also retrieved from SIA-SUS for comparison. The data were gathered by Brazilian State (26 States and the Federal District of Brazil) where the biopsy was performed.

Brazil notified its first case of COVID-19 on February 29, and the number one death with a confirmed diagnosis occurred on March 17. The country reached the milestone of 1,000 deaths from this disease on April 10. At the time of this study's finish—in the first half of August—the country has accumulated more than 3 million reported cases and more than 104 thousand deaths (Ministry of Health of Brazil, 2020c). The results of the present study showed an alarming decrease in the rate of mouth biopsies in all Brazilian regions in 2020, considering the average of March, April, and May, when compared

with previous years (Figure 1). The comparison between the same periods of the years 2019 and 2020 indicated a decrease of 68.8% in these rates for the entire country, with all regions showing a decline of over 60% (Table 1). This is a disquieting situation, as the real number of oral cancer cases and potentially malignant lesions that need diagnosis will not reduce in the pandemic scenario. For a disease with rapid evolution such as oral cancer, the lack of diagnostic procedures for a brief time will possibly result in diagnosis of tumors in more advanced stages. Late diagnosis of oral cancer reduces the chances of survival more than 200% (Seoane et al., 2016); this situation becomes even more relevant when we consider that, in a non-pandemic setting, only 40%–50% of patients with oral cancer survive after five years (Dantas et al., 2016).

The most pronounced decline in 2020 occurred in the Southeast region, followed by the South (Figure 1). The comparison between 2019 and 2020 indicated a decrease of 75.6% in the Southeast (Table 1). Southeast is the most developed region of the country, with the best-structured health system (Bigoni, Antunes, Weiderpass, & Kjørheim, 2019), and was unable to maintain even half of its biopsy rate during the pandemic. North, Northeast, and Midwest had the lowest biopsy rates in 2019 (Figure 2), which makes their decrease even more alarming, as there was possibly not enough diagnosis even before the pandemic. When analyzed by sex and age, the decrease in biopsy rates was homogeneous between the different groups: 75.3%, 62.5%, and 62.8% of reduction, respectively, for children and adolescents, adults, and elderly males; 76.1%, 71.7%, and 70.0%, respectively, for the same age groups of female individuals.

In line with these national data, the number of oral specimens collected in the Diagnostic Center for Oral Diseases (DCOD) of the Federal University of Pelotas, Brazil, between March and April 2020, was 69.9% lower than in the same period of the year 2019. More specifically, potentially malignant disorders (i.e., oral dysplasia and carcinoma in situ) and oral squamous cell carcinoma, that accounted for

8.8% and 7.4% of all diagnoses in the pre-COVID-19 era, decreased by 89% and 44%, respectively (Gomes, Schuch, Tarquinio, Etges, & Vasconcelos, 2020). Arbitrarily extending this local scenario to the whole country, 467 diagnoses of potentially malignant disorders and 194 diagnoses of oral squamous cell carcinoma would be missing in just three months, suggesting a considerable increase in the burden of oral cancer in Brazil in forthcoming years. This alarming situation is due to an overall general decrease in outpatient visits in oral medicine centers in Brazil. For example, in the A.C. Camargo Cancer Center of São Paulo, oral medicine visits decreased by 53.2% in the first six weeks of lockdown compared to the last six weeks before the lockdown (Alves et al., 2020).

These data reveal the worrying scenario that the COVID-19 pandemic has been outlining for oral cancer care and are compatible with some findings that are beginning to emerge in other countries. During the outbreak in Italy, a referral service for diagnosis of oral cancer in Turin diagnosed only 1/7 of the new cancer cases they expected to identify (Arduino, Conrotto, & Broccoletti, 2020). Following its natural history, oral cancer will continue to affect the population; the new reality will not impact its pace. However, the profoundly altered health system will miss several opportunities for early diagnosis and will have to manage this repressed demand in more advanced stages of the disease. Part of this pent-up demand may evolve into increase in mortality, that was stable in Brazil in the last decades (Perea, Peres, Boing, & Antunes, 2018).

When health systems collapse and fail, people respond with suffering and death. Monitoring the health system's productivity during the pandemic period is critical to reducing adverse outcomes at the population level. The pandemics' prejudicial impact on the system of health may linger for a more extended period than expected. Shedding light on the problem and raising awareness of the need to resume diagnostic routines is critical to oral cancer management and control; this report is a call for action, without disregarding biosafety measures imposed by the new reality. Recording the loss of

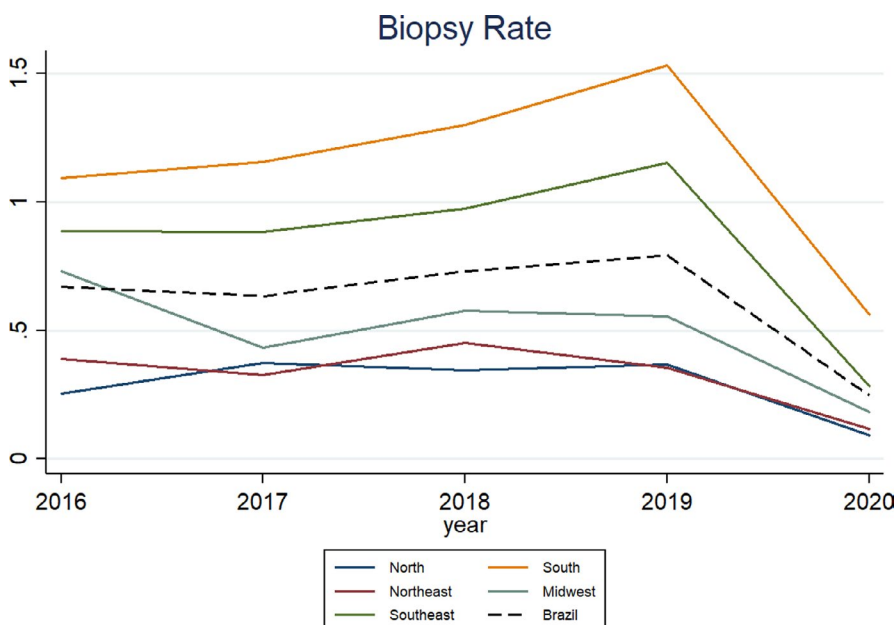


FIGURE 1 Average monthly rate of biopsies (per 100,000 inhabitants) of March to May, by Brazilian regions

TABLE 1 Number of biopsies and average monthly biopsy rate (per 100,000 inhabitants) of March to May, by Brazilian regions

Region (n. FU)	March-May 2019		March-May 2020		
	n. Biopsies	Biopsy Rate	n. Biopsies	Biopsy Rate	Rate Change (%)
North (n. 7)	249	0.37	95	0.09	-75.3
Northeast (n. 9)	681	0.35	255	0.12	-66.6
Southeast (n. 4)	3,462	1.15	983	0.28	-75.6
South (n. 3)	1,335	1.53	504	0.56	-63.3
Midwest (n. 4)	241	0.56	72	0.18	-67.0
Brazil (n. 27)	5,968	0.79	1909	0.25	-68.8

Abbreviations: FU, federation unity; n, number of.

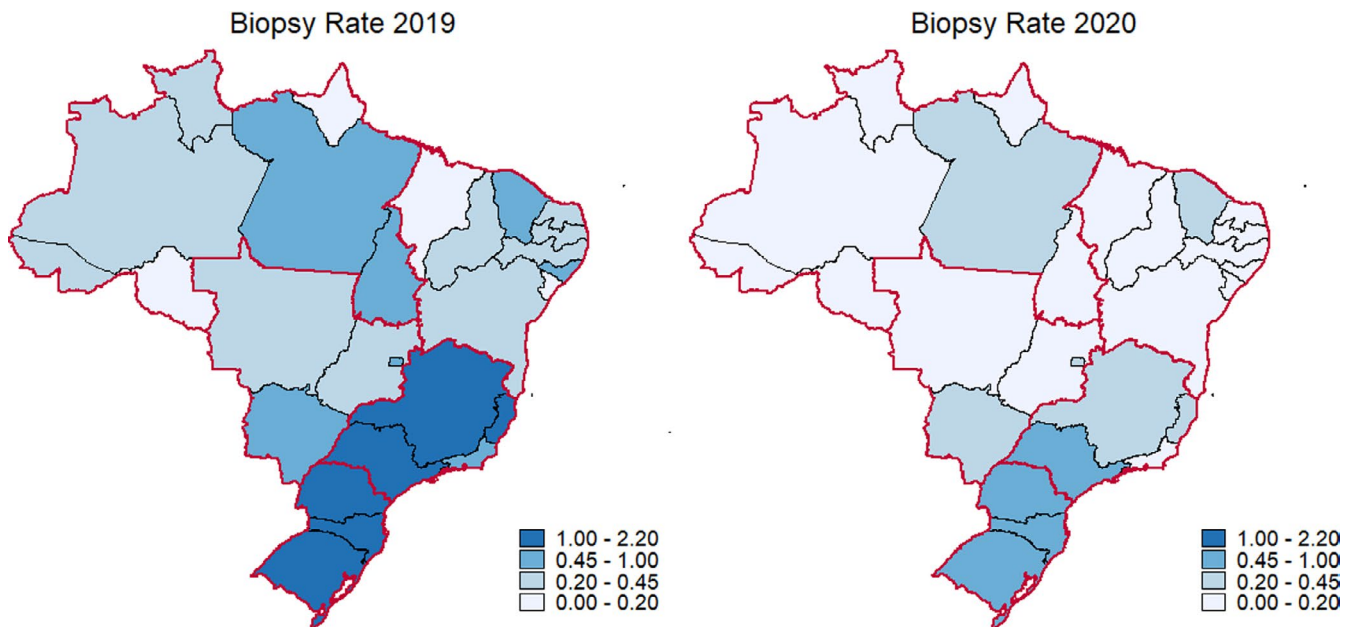


FIGURE 2 Average biopsy rate for March, April, and May (per 100,000 inhabitants), by Brazilian states. The black lines delimit the states of Brazil; the red lines delimit the regions of Brazil

efficiency of healthcare procedures aimed at other diseases during the pandemics may allow health policy and planning to counterbalance the impact of COVID-19 on oral cancer trends.

CONFLICT OF INTEREST

None to declare.

AUTHOR CONTRIBUTIONS

Amanda Ramos da Cunha: Conceptualization; Data curation; Formal analysis; Investigation; Methodology; Project administration; Resources; Software; Writing-original draft; Writing-review & editing. **Jose Leopoldo Ferreira Antunes:** Conceptualization; Formal analysis; Investigation; Methodology; Project administration; Supervision; Validation; Visualization; Writing-original draft; Writing-review & editing. **Manoela Domingues Martins:** Conceptualization; Investigation; Project administration; Supervision; Validation; Visualization; Writing-review & editing. **Stefano Petti:** Conceptualization; Investigation; Methodology; Project administration; Supervision; Validation;

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