

Impact of the COVID-19 Pandemic on the Diagnosis of Oral Cancer in Brazil

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Impacto da Pandemia da Covid-19 no diagnóstico do Câncer de Boca no Brasil

Impacto de la Pandemia de Covid-19 en el Diagnóstico de Cáncer Bucal en Brasil

Adriana Tavares de Moraes Atty¹; Jeane Tomazelli²; Maria Beatriz Kneipp Dias³; Caroline Madalena Ribeiro⁴

ABSTRACT

Introduction: The identification and investigation of suspicious lesions in the oral cavity is crucial for the early diagnosis of oral cancer. The survival of diagnosed cases and the quality of life of the patients are directly affected by cancer treatment with a worse prognosis in advanced tumors. **Objective:** To evaluate the impact of the COVID-19 pandemic on the performance of diagnostic procedures for oral cancer in Brazil. **Method:** Cross-sectional study with data from the SUS Outpatient Information System (SIA-SUS). The average of diagnostic procedures recorded monthly, half-yearly and annually in the pre-pandemic period (2016 a 2019) was compared, through the percentage variation, with the production recorded in the pandemic (2020). **Results:** There was a drop in diagnostic procedures for cancer of the lip and oral cavity in 2020 compared to the period 2016 to 2019, with the exception of the South and Midwest regions. The Northeast region had the highest negative percentage change (-26.2%) among the average of procedures performed between 2016 and 2019 compared to 2020. Rondônia and Goiás showed positive variations, 66.2% and 43.5%, respectively. The country recorded the biggest percentage reductions in April (-43.2%) and in May (-42.3%) 2020, returning to positive variation only in December (10.6%). And with the exception of the North region, the second half of 2020 was worse than the first. **Conclusion:** The pandemic had an impact on the performance of oral cancer diagnoses. The findings indicate the need for guidance to health professionals and the population on the urgency of the diagnosis of oral cancer.

Key words: mouth neoplasms/diagnosis; early detection of cancer; oral health; epidemiology; descriptive; COVID-19.

RESUMO

Introdução: A identificação e a investigação de lesões suspeitas na cavidade oral são determinantes para o diagnóstico precoce do câncer de boca. A sobrevivência dos casos diagnosticados e a qualidade de vida dos pacientes são diretamente afetadas pelo tratamento oncológico com pior prognóstico em tumores avançados. **Objetivo:** Avaliar o impacto da pandemia da covid-19 na realização de procedimentos diagnósticos para câncer de boca no Brasil. **Método:** Estudo transversal com dados do Sistema de Informações Ambulatoriais do Sistema Único de Saúde (SIA/SUS). A média de procedimentos diagnósticos registrados mensal, semestral e anualmente no período pré-pandemia (2016 a 2019) foi comparada, por meio da variação percentual, com a produção registrada no período pandêmico (2020). **Resultados:** Observou-se diminuição dos procedimentos de diagnóstico para o câncer de lábio e cavidade oral em 2020 comparado com o período de 2016 a 2019, com exceção das Regiões Sul e Centro-Oeste. A Região Nordeste apresentou a maior variação percentual negativa (-26,2%) entre a média de procedimentos realizados de 2016 a 2019 em comparação ao ano de 2020. Rondônia e Goiás apresentaram variação positiva, 66,2% e 43,5%, respectivamente. O país registrou as maiores reduções percentuais em abril (-43,2%) e em maio (-42,3%) de 2020, retornando à variação positiva apenas em dezembro (10,6%). Com exceção da Região Norte, o segundo semestre de 2020 foi pior do que o primeiro. **Conclusão:** A pandemia da covid-19 impactou a realização de diagnósticos de câncer de boca. Os achados indicam necessidade de orientações para profissionais de saúde e para a população sobre o caráter de urgência do diagnóstico de câncer de boca.

Palavras-chave: neoplasias bucais/diagnóstico; detecção precoce de câncer; saúde bucal; epidemiologia descritiva; COVID-19.

RESUMEN

Introducción: La identificación y la investigación de lesiones sospechosas en la cavidad bucal son cruciales para el diagnóstico precoz del cáncer oral. La supervivencia de los casos diagnosticados y la calidad de vida de los usuarios se ven directamente afectadas por el tratamiento del cáncer con peor pronóstico en tumores avanzados. **Objetivo:** Evaluar el impacto de la pandemia de covid-19 en la realización de procedimientos diagnósticos de cáncer oral en Brasil. **Método:** Estudio transversal con datos del Sistema de Información de Ambulatorios del Sistema Único de Salud (SIA/SUS). El promedio de procedimientos diagnósticos registrados mensual, semestral y anualmente en el período previo a la pandemia (2016 a 2019) se comparó, a través de la variación porcentual, con la producción registrada en el período pandémico (2020). **Resultados:** Se observó una disminución de los procedimientos de diagnóstico de cáncer de labio y cavidad oral en 2020 en comparación con el período de 2016 a 2019, con la excepción de las Regiones del Sur y del Medio Oeste. La Región Noreste presentó la mayor variación porcentual negativa (-26,2%) entre el promedio de procedimientos realizados de 2016 a 2019 en comparación con el año 2020. Rondônia y Goiás mostraron una variación positiva, 66,2% y 43,5%, respectivamente. El país registró las mayores reducciones porcentuales en abril (-43,2%) y mayo (-42,3%) de 2020, volviendo a la variación positiva sólo en diciembre (10,6%). Con la excepción de la Región Norte, el segundo semestre de 2020 fue peor que el primero. **Conclusión:** La pandemia de covid-19 impactó en el número de diagnósticos de cáncer oral. Los resultados indican la necesidad de orientar a los profesionales de la salud y a la población sobre el carácter urgente del diagnóstico del cáncer oral.

Palabras clave: neoplasias de la boca/diagnóstico; detección precoz del cáncer; salud bucal; epidemiología descriptiva; COVID-19.

¹Instituto Nacional de Câncer José Alencar Gomes da Silva (INCA). Rio de Janeiro (RJ), Brazil.

¹E-mail: adrianaatty@gmail.com. Orcid iD: <https://orcid.org/0000-0003-2271-746X>

²E-mail: jtomazelli@inca.gov.br. Orcid iD: <https://orcid.org/0000-0002-2472-3444>

³E-mail: mdias@inca.gov.br. Orcid iD: <https://orcid.org/0000-0002-5847-9830>

⁴E-mail: cribeiro@inca.gov.br Orcid iD: <https://orcid.org/0000-0003-2690-5791>

Corresponding author: Adriana Tavares de Moraes Atty. Rua Marquês de Pombal, 125, 7º andar – Centro. Rio de Janeiro (RJ), Brazil. CEP 22230-240. E-mail: adrianaatty@gmail.com



INTRODUCTION

Oral cavity cancer is a group of cancers that includes different anatomic sites, from lips to oropharynx^{1,2}. The disease can be diagnosed at initial stages through biopsies of suspicious lesions identified during the clinical exam of the mouth³. Despite the high relevance of early diagnosis utilizing simple diagnostic techniques to examine the oral cavity, an anatomic region of easy access, nearly 75% of the cases in Brazil are diagnosed at advanced stages (stages 3 and 4), a challenge for care and control⁴.

The diagnosis and treatment of oral cavity cancer at initial stages is associated with better quality-of-life and survival^{5,6}. Therefore, it is recommended that individuals with signs or symptoms of the disease seek medical care immediately^{7,8}. It is expected that dentists are aware about any alteration of tissues of the oral cavity, adopting visual inspections as part of their routines and that other health professionals are attentive to the patients' complaints⁹.

In 2020, the pandemic caused by the coronavirus disease 2019 (COVID-19) impacted the whole world. The first case was reported in Brazil in February 2020 and in March, the Ministry of Health¹⁰ determined the criteria for isolation and quarantine. States and municipalities adopted different measures to control the spread of the virus considering the number of new cases and deaths¹¹.

Social distancing and isolation measures that were implemented to control the COVID-19 pandemic^{10,12} affected the entire health system and impacted the screening and diagnosis of all types of cancer^{13,14}. Overall, working practices changed due to the enforced social isolation. Routine consultations and screening exams were postponed, and only urgent and symptomatic cases were diagnosed¹⁵. The population was oriented to seek health services only if unavoidable like manifestations of signs or symptoms of cancer¹⁶.

However, for oral cavity cancer where the initial lesions quite often do not onset with painful symptoms and are easily confounded with other benign alterations as canker sores¹⁷, it is possible that additional diagnoses delays of cases in initial stages may have occurred.

The objective of this study was to evaluate the impact of the COVID-19 pandemic on diagnostic procedures of oral cavity in Brazil in 2020.

METHOD

Descriptive, cross-sectional study utilizing data from health systems information during the pre-pandemic period from 2016 to 2019 and in the pandemic year of 2020 in Brazil.

Deidentified, public access data from individuals registered at SUS Outpatient Information System (SIA/SUS)¹⁸, available at the website of SUS Computer Data System (DATASUS) were utilized.

According to SUS Management System of the Procedures, Medications, Orthosis and Special Materials (SIGTAP)¹⁹, the biopsies of pharynx (code: 0201010194), salivary gland (code: 0201010232), skull and face bone (code: 0201010348), skin and soft parts (code: 0201010372), soft tissues of the mouth (code: 0201010526) and computed tomography-guide percutaneous biopsy (code: 0201010542) were considered as procedures of diagnostic investigation of lip and oral cavity cancers (code: 0201010372)¹⁹.

The procedures were selected when the codes of the International Statistical Classification of Diseases and Related Health Problems 10th Revision matched the main diagnosis reported (ICD-10)²⁰: C00 to C10 – malignant neoplasms of the lip; C01 – malignant neoplasm of base of tongue; C02 – malignant neoplasm of other and unspecified parts of the tongue; C03 – malignant neoplasm of gum; C04 – malignant neoplasm of the floor of the mouth; C05 – malignant neoplasm of the palate; C06 – malignant neoplasm of other and unspecified parts of the mouth; C07 – malignant neoplasm of the parotid gland; C08 – malignant neoplasm of other and unspecified major salivary gland; C09 – malignant neoplasm of the amygdala; C10 – malignant neoplasm of the oropharynx; D10 – benign neoplasm of the mouth and of the pharynx and K132 – leukoplasia and other disturbances of the oral epithelium, including tongue. The selection of the ICD-10 codes in the current study considered the diagnostic hypothesis that triggers the biopsy contingent upon histopathology confirmation.

Although the selected procedures have specific ICDs codes defined on SIGTAP¹⁹, there is no validation of this field in the system which justifies the selection of the diagnoses described earlier for all the procedures adopted in the present study.

The data were analyzed for the 27 Federation Units and regions of residence (North, Northeast, Southeast, South and Midwest), sex (male and female) and age ranges: less than 40 years, 40 to 59 years, 60 to 79 years and 80 years or more.

The mean of procedures registered monthly, bi-annually and annually between 2016 and 2019 (pre-pandemic) was compared through the percent change, to the number of procedures registered in 2020 (pandemic), according to the calculation:

$$\frac{\text{Production of biopsies registered in 2020} - \text{Mean of production of exams registered from 2016 to 2019}}{\text{Mean of production of exams registered from 2016 to 2019}} \times 100$$

A graphic analysis of the biopsies performed in 2020 was carried out, utilizing the monthly mean and confidence intervals (upper and lower limits) of the production of procedures at the pre-pandemic and pandemic periods, considering the level of confidence of 0.05, allowing to investigate to what extent the production did not match the estimates for 2020.

The data were analyzed with the software *R*²¹, version 4.0.4, and package *Tidyverse*²².

The review by the Institutional Review Board was waived because only deidentified, secondary data were analyzed in compliance with the guidelines of the Resolution 510, April 7, 2016²³ of the National Health Council, item V, article 1.

RESULTS

To diagnose oral cancer, 29,804 procedures were performed in 2016, 32,000 in 2017, 35,075 in 2018, 46,423 in 2019 and 32,314 in 2020 in Brazil, with pre-pandemic annual mean of 35,826 biopsies (Table 1).

Except the South and Midwest regions, the other country regions had decline of the diagnosis procedures of lip and oral cavity cancer in 2020. The percent variation between the mean number of procedures performed from 2016 to 2019 compared to 2020 oscillated between 7.3% in the Midwest and -26.2% at the Northeast regions (Table 1).

Rondônia (66.2%) and Goiás (43.4%) stand out among the Federation Units with positive variation. Amapá failed to register any procedure in 2020 while Acre (-65.6%), Alagoas (-65.9%) and Paraíba (-66.0%) had the biggest drops of the production of biopsies (Table 1).

The analysis of the month variation among the regions showed that, with exception of the North and Northeast regions, the others presented opposite results of the percent variation since April 2020. In this same year, the biggest percent reduction for the country were reported in April (-43.2%) and in May (-42.3%), returning to positive only in December (10.6%). The North region was the only one with negative variation in December (-186%) and the Midwest, the only one which increased the number of biopsies in May (Table 2).

It is possible to notice that for all the regions, the monthly production in January and February 2020 was above the upper limit estimated for the period from 2016 to 2019. In April 2020, the registries of biopsies dropped below the lower limit estimated for all the country regions. This scenario continued until August 2020 in the Southeast region (Graph 1).

The difference of production of biopsies from 2016 to 2019 and 2020 was more unfavorable in the second semester when compared to the first, except the North

region. The Midwest region stands out with a positive production in the first semester of 2020 but declined in the second semester of this same year (Graph 2).

All the regions had negative percent variation in the age-range of less than 40 years. The Northeast region presented negative percent variation for all age ranges and the Southeast region, positive percent variation only in the age range of 80 years or more. Reduction of biopsy in women for all the country regions was noticed in the analysis of the distribution per sex, reaching -36.7% in the Northeast. Among men, the Southeast, South and Midwest regions had positive variation of 2.5%, 20.6% and 18.4%, respectively (Table 3).

DISCUSSION

The impact of the COVID-19 pandemic on the diagnosis of lip and oral cavity cancer was revealed by the decline of the production of biopsies in Brazil with variations across regions and states. The drop of the register of biopsies at SUS is remarkable since April 2020, reaching values above 50% at the North and Northeast regions.

Studies conducted by oral pathology laboratories of two Brazilian universities identified a drop of 44%²⁴ and 51%²⁵ in the detection of cases of oral cavity cancer in 2020 in relation to 2019. Nearly 45% of the biopsies performed in Brazil in 2018 were suspected of leukoplakia²⁶, an oral potentially malignant disorder (OPMD)²⁷, whose monitoring is required to prevent or diagnose oral cavity cancer earlier.

A national-based study detected a drop of 35% of the biopsies for all types of cancer in Brazil between 2019 and 2020²⁸, higher than the results found in this study. Possibly, the difference is related to high impact of small values of the percent variation calculated for the diagnosis of oral cancer.

A study conducted in Spain concluded that a drop of 34% of cancer diagnoses occurred, more frequent in men older than 64 years²⁹, considered a group of high risk of oral cancer. Although the drop has been more expressive during the lockdown (from March to June 2020), it did not return to pre-pandemic levels in the future period analyzed (from July to September 2020), reinforcing the necessity to pursue strategies to mitigate the effects of this delay.

In despite of older adults presenting the worst COVID-19 outcomes and potentially delaying medical consultation during the recommended social distancing period, it was found higher decline of biopsies registries in younger adults (less than 40 years). Hypotheses as the necessity of matching the work or study to virtual modality³⁰ and stress due to income loss together with lower suspicion of cancer for this age range may have been

Table 1. Total annual diagnostic procedures in the oral cavity according to year of consultation and percent variation among the pre-pandemic (2016-2019) and pandemic periods (2020). Brazil, Regions and Federation Units

Region/FU of residence	2016	2017	2018	2019	2020	Mean 2016 and 2019	%* Variation
	n	n	n	n	n	n	
North	1,181	1,672	1,508	2,086	1,455	1,612	-9.7
Acre	35	29	49	38	13	38	-65.6
Amazonas	420	787	546	543	351	574	-38.9
Amapá	28	15	24	4	0	14	-100.0
Pará	577	633	748	1,216	912	794	14.9
Rondônia	18	13	40	148	91	55	66.2
Roraima	14	26	24	30	33	24	40.4
Tocantins	89	169	77	107	55	111	-50.2
Northeast	3,917	4,202	4,213	6,886	3,545	4,805	-26.2
Alagoas	146	317	321	2358	268	786	-65.9
Bahia	1,031	1,302	1,130	1,190	854	1,163	-26.6
Ceará	678	813	976	985	681	863	-21.1
Maranhão	23	31	55	115	44	56	-21.4
Paraíba	258	178	188	471	93	274	-66.0
Pernambuco	816	646	653	613	572	682	-16.1
Piauí	533	385	488	536	482	486	-0.7
Rio Grande do Norte	264	422	297	575	416	390	6.8
Sergipe	168	108	105	43	135	106	27.4
Southeast	18,572	20,512	22,313	27,796	19,796	22,298	-11.2
Espírito Santo	934	1,073	1,093	1,516	1,437	1,154	24.5
Minas Gerais	2,001	2,486	2,688	4,351	4,019	2,882	39.5
Rio de Janeiro	995	1,120	1,819	2,021	1,624	1,489	9.1
São Paulo	14,642	15,833	16,713	19,908	12,716	16,774	-24.2
South	4,141	4,031	5,155	7,024	5,348	5,088	5.1
Pará	1,749	1,726	2,132	2,618	1,953	2,056	-5.0
Rio Grande do Sul	1,283	1,348	1,759	2,550	2,031	1,735	17.1
Santa Catarina	1,109	957	1,264	1,856	1,364	1,297	5.2
Midwest	1,993	1,583	1,886	2,631	2,170	2,023	7.3
Distrito Federal	159	82	136	208	206	146	40.9
Goiás	641	681	799	1,248	1,209	842	43.5
Mato Grosso do Sul	597	531	637	825	568	648	-12.3
Mato Grosso	596	289	314	350	187	387	-51.7
Brazil	29,804	32,000	35,075	46,423	32,314	35,826	-9.8

Source: SIA/SUS¹⁸.

(*) Percent variation among the means from 2016 to 2019 and 2020.

Table 2. Total monthly diagnostic procedures in the oral cavity according to year of consultation and percent variation among the pre-pandemic (2016 to 2019) and pandemic (2020) periods. Brazil and regions

Region	Visit	2016	2017	2018	2019	2020	Mean 2016 and 2019	%* Variation
		n	n	n	n	n	n	
North	January	131	121	82	151	157	121.25	29.5
	February	82	114	166	144	159	126.5	25.7
	March	124	165	120	154	107	140.75	-24.0
	April	95	142	106	128	35	117.75	-70.3
	May	127	152	111	136	110	131.5	-16.3
	June	102	125	84	199	95	127.5	-25.5
	July	90	144	101	169	92	126	-27.0
	August	101	186	169	207	144	165.75	-13.1
	September	79	129	122	174	141	126	11.9
	October	59	97	183	201	144	135	6.7
	November	76	151	114	195	141	134	5.2
	December	115	146	150	228	130	159.75	-18.6
Northeast	January	269	282	382	278	366	302.75	20.9
	February	287	326	276	308	350	299.25	17.0
	March	363	348	436	287	315	358.5	-12.1
	April	307	355	404	308	153	343.5	-55.5
	May	439	394	414	451	130	424.5	-69.4
	June	350	372	301	384	221	351.75	-37.2
	July	229	422	356	666	296	418.25	-29.2
	August	358	412	354	491	314	403.75	-22.2
	September	406	330	357	461	373	388.5	-4.0
	October	292	352	350	1424	319	604.5	-47.2
	November	323	332	313	1467	353	608.75	-42.0
	December	294	277	270	361	355	300.5	18.1
Southeast	January	1,063	1,463	1,613	1,741	2,059	1,470	40,1
	February	1,441	1,539	1,687	1,769	2,080	1,609	29,3
	March	1,545	1,690	1,698	1,917	1,854	1,712.5	8,3
	April	1,442	1,514	1,733	2,229	996	1,729.5	-42,4
	May	1,602	1,854	1,953	2,483	1,030	1,973	-47,8
	June	1,808	1,780	1,896	2,379	1,448	1,965.75	-26,3
	July	1,677	1,819	1,941	2,543	1,416	1,995	-29,0
	August	1,764	2,029	2,186	2,819	1,685	2,199.5	-23,4
	September	1,608	1,719	2,019	2,738	1,800	2,021	-10,9
	October	1,655	1,781	2,176	2,884	1,879	2,124	-11,5
	November	1,637	1,804	1,809	2,479	1,929	1,932.25	-0,2
	December	1,330	1,520	1,602	1,815	1,620	1,566.75	3,4

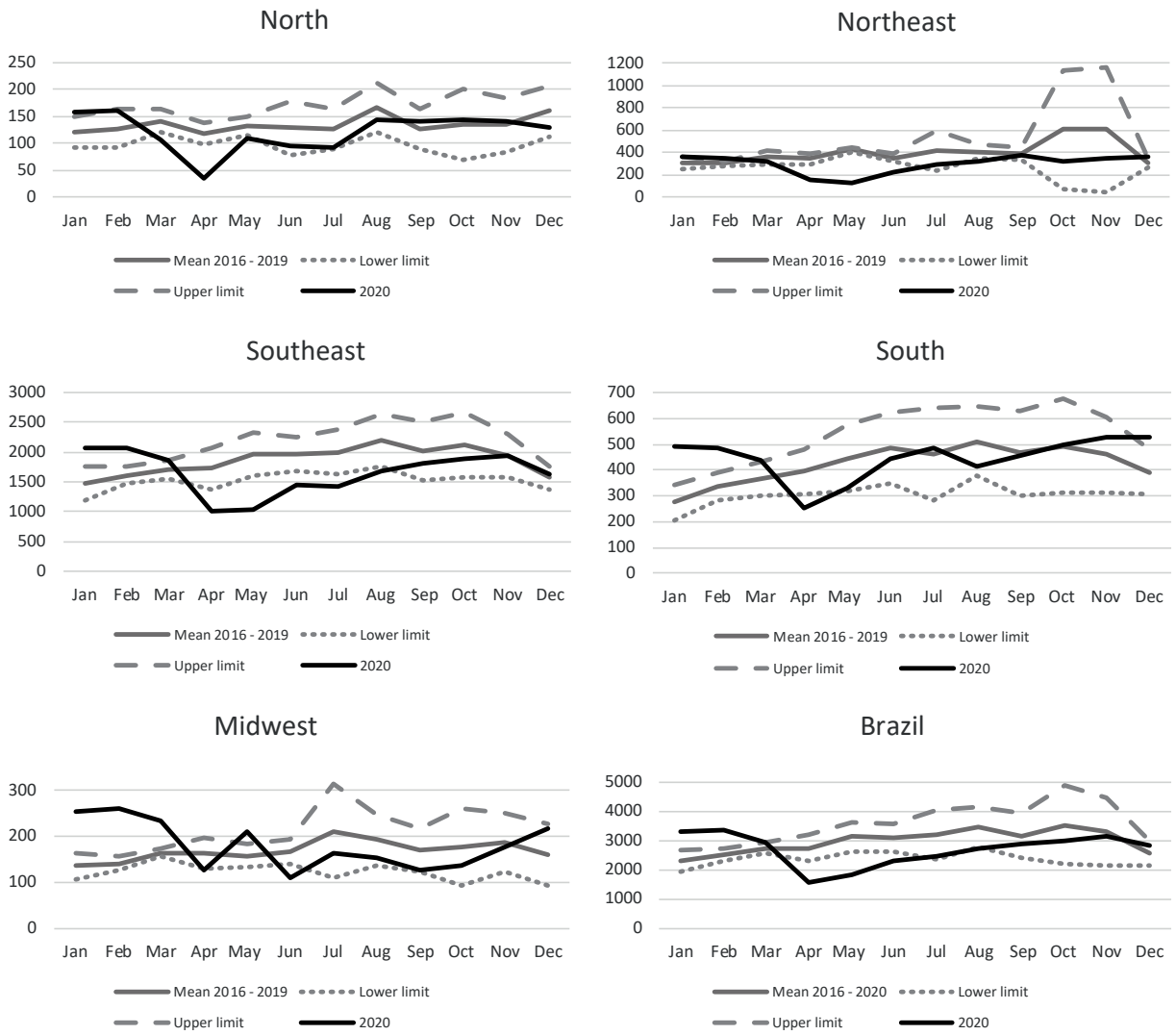
to be continued

Table 2. continuation

Region	Visit	2016	2017	2018	2019	2020	Mean 2016 and 2019	%* Variation
		n	n	n	n	n	n	
South	January	199	282	256	366	492	275.75	78.4
	February	291	290	358	406	485	336.25	44.2
	March	316	359	328	462	437	366.25	19.3
	April	390	278	428	486	251	395.5	-36.5
	May	352	368	434	632	330	446.5	-26.1
	June	487	310	491	657	446	486.25	-8.3
	July	324	388	399	732	487	460.75	5.7
	August	422	393	538	694	412	511.75	-19.5
	September	365	312	494	689	456	465	-1.9
	October	330	349	578	719	499	494	1.0
	November	335	368	471	661	525	458.75	14.4
	December	330	334	380	520	528	391	35.0
Midwest	January	116	178	123	122	253	134.75	87.8
	February	156	152	126	127	262	140.25	86.8
	March	167	154	173	164	235	164.5	42.9
	April	167	114	174	195	127	162.5	-21.8
	May	157	127	186	162	209	158	32.3
	June	197	132	159	181	111	167.25	-33.6
	July	172	141	164	367	163	211	-22.7
	August	230	139	148	251	154	192	-19.8
	September	183	120	145	232	126	170	-25.9
	October	171	92	150	296	135	177.25	-23.8
	November	149	129	195	273	178	186.5	-4.6
	December	128	105	143	261	217	159.25	36.3
Brazil	January	1,778	2,326	2,456	2,658	3,327	2,304.5	44.4
	February	2,257	2,421	2,613	2,754	3,336	2,511.25	32.8
	March	2,515	2,716	2,755	2,984	2,948	2,742.5	7.5
	April	2,401	2,403	2,845	3,346	1,562	2,748.75	-43.2
	May	2,677	2,895	3,098	3,864	1,809	3,133.5	-42.3
	June	2,944	2,719	2,931	3,800	2,321	3,098.5	-25.1
	July	2,492	2,914	2,961	4,477	2,454	3,211	-23.6
	August	2,875	3,159	3,395	4,462	2,709	3,472.75	-22.0
	September	2,641	2,610	3,137	4,294	2,896	3,170.5	-8.7
	October	2,507	2,671	3,437	5,524	2,976	3,534.75	-15.8
	November	2,520	2,784	2,902	5,075	3,126	3,320.25	-5.9
	December	2,197	2,382	2,545	3,185	2,850	2,577.25	10.6

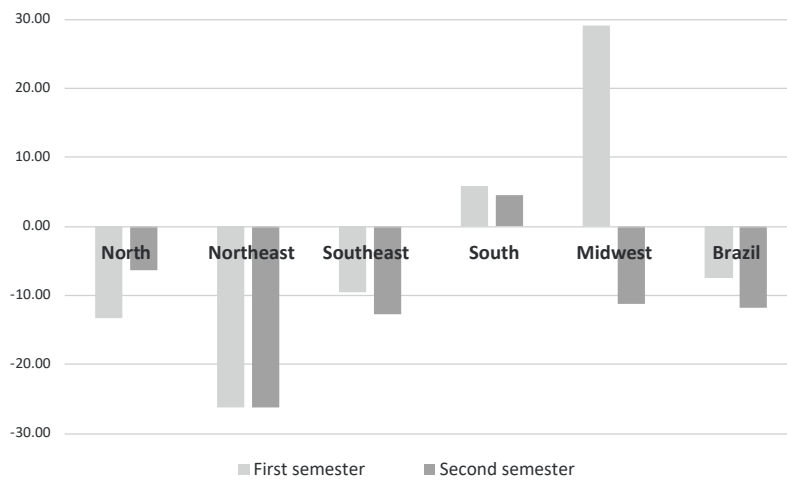
Source: SIA/SUS¹⁸.

(*) Percent variation among the mean from 2016 to 2019 and 2020.



Graph 1. Monthly distribution of biopsy in the pre-pandemic (mean among 2016 and 2019) and pandemic (2020) periods. Brazil and Regions

Source: SIA/SUS¹⁸.



Graph 2. Percent variation of the production of biopsies among the mean of the first and second semester from 2016 to 2019 and 2020

Source: SIA/SUS¹⁸.

Table 3. Total annual diagnostic procedures in oral cavity per age-range in pre-pandemic (mean from 2016 to 2019) and pandemic periods (2020) and percent change according to age-range and sex. Brazil, Regions

Region	Age-range (years)	2016	2017	2018	2019	2020	Mean from 2016 to 2019	%* Variation
		n	n	n	n	n	n	
Age-range (years)								
North	< 40	420	618	572	725	358	538.6	-33.5
	40 to 59	401	570	540	657	569	547.4	3.9
	60 to 79	321	435	329	628	491	440.8	11.4
	80 or more	39	49	67	76	37	53.6	-31.0
Northeast	< 40	810	871	894	1,481	651	941.4	-30.8
	40 to 59	1,542	1,678	1,642	2,770	1,371	1,800.6	-23.9
	60 to 79	1,354	1,409	1,482	2,258	1,312	1,563.0	-16.1
	80 or more	211	244	195	377	211	247.6	-14.8
Southeast	< 40	2,897	3,128	3,519	4,325	2,380	3,249.8	-26.8
	40 to 59	7,711	8,356	8,677	10,386	7,486	8,523.2	-12.2
	60 to 79	7,250	8,265	9,164	11,950	9,010	9,127.8	-1.3
	80 or more	714	763	953	1,135	920	897.0	2.6
South	< 40	888	851	1,030	1,349	846	992.8	-14.8
	40 to 59	1,754	1,683	2,132	2,916	2,087	2,114.4	-1.3
	60 to 79	1,374	1,389	1,810	2,520	2,130	1,844.6	15.5
	80 or more	125	108	183	239	285	188.0	51.6
Midwest	< 40	586	340	333	475	421	431.0	-2.3
	40 to 59	755	666	857	1,056	894	845.6	5.7
	60 to 79	584	519	638	986	789	703.2	12.2
	80 or more	68	58	58	114	66	72.8	-9.3
Brazil	< 40	5,601	5,808	6,348	8,355	4,656	6,528.0	-28.7
	40 to 59	12,163	12,953	13,848	17,785	12,407	14,187.3	-12.5
	60 to 79	10,883	12,017	13,423	18,342	13,732	13,666.3	0.5
	80 or more	1,157	1,222	1,456	1,941	1,519	1,444.0	5.2
Sex								
North	Male	682	831	693	1,017	772	805.8	-4.2
	Female	499	841	815	1,069	683	806.0	-15.3
Northeast	Male	1,982	2,201	2,146	3,259	2,022	2,397.0	-15.6
	Female	1,935	2,001	2,067	3,627	1,523	2,407.5	-36.7
Southeast	Male	10,512	11,680	12,165	14,986	12,648	12,335.8	2.5
	Female	8060	8,832	10,148	12,810	7,148	9,962.5	-28.3
South	Male	2,093	2,017	2,422	3,599	3,054	2,532.8	20.6
	Female	2,048	2,014	2,733	3,425	2,294	2,555.0	-10.2
Midwest	Male	969	899	1,056	1,502	1,310	1,106.5	18.4
	Female	1,024	684	830	1,129	860	916.8	-6.2
Brazil	Male	16,238	17,628	18,482	24,363	19,806	19,177.8	3.3
	Female	13,566	14,372	16,593	22,060	12,508	16,647.8	-24.9

Source: SIA/SUS¹⁸.

(*) Percent change between the mean from 2016 to 2019 and 2020.

the motives for less consultations in cases of suspicious lesions in the oral cavity.

Although women utilize more health services³¹ traditionally, a significant decline of biopsy for this population was detected possibly because women were more adherent to social distancing³².

The peak of the pandemic in 2020 varied among the states, impacting some of them of the North and Northeast regions in May and June³³. However, the highest negative variation of the production of biopsies occurred in April 2020, possibly because of best adherence to the restrictive measures initiated in March of the same year. Although some states presented positive variation in the period investigated, the mean number of procedures performed along the years in these states is quite low which compromised the evaluation.

Due to the high risk of contamination during dental appointment, entities and class bodies issued recommendations for this modality during the pandemic, recommending that only urgent and emergency cases should be consulted.

The American Dental Association published a document where the biopsy of altered tissues was defined as an emergency procedure in the scenario of the pandemic³⁴. In Brazil, the Brazilian Health Regulatory Agency (Anvisa) and the General Coordination of Oral Health of the Family Health Department of the Primary Health Attention included biopsies of suspicious lesions as urgent procedures^{35,36}. However, a publication of the “*Associação de Medicina Intensiva Brasileira (AMIB)*” in March 2020 in partnership with the Federal Odontology Council (CFO)³⁷ did not include biopsy as an emergency and urgent procedure. The early diagnosis of lip and oral cavity cancer initiating oncologic treatment of tumors at early stage is associated with extended survival³⁸ with moderate aesthetic and functional compromise.

COVID-19 pandemic was an obstacle for early diagnosis and consequently the initiation of oncologic treatment worldwide. As quoted by Nowińska et al.³⁹, the outcomes of this period are yet to be found in the short and medium term with potential increase of mortality rate and worst quality-of-life.

The present study has limitations inherent to the use of secondary data of SUS' information systems, in addition to the possible aggravation caused by the pandemic with overload of the Health Secretaries and potential impact on registering the outpatient production at SIA/SUS.

CONCLUSION

The results found indicate there was a reduction of diagnostic investigation of lip and oral cavity cancer

in Brazil in 2020, which can lead to an increase of the proportion of cases diagnosed at advanced stages already elevated in the country in the upcoming years. The managers should address the following topics to minimize the COVID-19 pandemic impacts on the delay of diagnosis of oral cancer: reinforce the strategies of communication which emphasize the main signs of the disease, warning the population about the importance of not postponing any initiative to seek medical care in case of any suspicious lesion of the oral cavity and organization of the Health Attention Network to optimize the flow of individuals with these lesions.

CONTRIBUTIONS

All the authors contributed substantially to the study design, acquisition, analysis and interpretation of the data, wording and critical review. They approved the final version to be published.

DECLARATION OF CONFLICT OF INTERESTS

There is no conflict of interests to declare.

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