












# Socioeconomic inequalities in the use of dental services in Brazil: an analysis of the 2019 National Health Survey

*Desigualdades socioeconômicas no uso de serviços odontológicos no Brasil: uma análise da Pesquisa Nacional de Saúde de 2019*

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**ABSTRACT:** *Objective:* To describe the prevalence of use of dental services in Brazil according to states and the Federal District and its relationship with socioeconomic variables and types of services, based on the 2019 National Health Survey. *Methods:* This is a cross-sectional population-based study using data from the 2019 National Health Survey, which included 88,531 participants aged 18 or older. We assessed variables related to the use of dental health services according to sociodemographic and behavioral characteristics through multivariate analysis, using a Poisson regression model with robust variance. *Results:* The use of dental services in the year prior to the interview was higher among adults (53.2%, confidence interval — 95%CI 52.5–53.9) than older adults (34.3%, 95%CI 33.2–34.4). The multivariate analysis revealed that the use of dental services was greater in people with better schooling (prevalence ratio — PR=2.02, 95%CI 1.87–2.18) and higher income (PR=1.54, 95%CI 1.45–1.64). States from the Southeast, Midwest, and South regions presented the highest percentages of individuals who visited a dentist in the previous year — between 49.0 and 57.6% of the population. *Conclusion:* Inequalities were found in the use of dental health services among the adult and older adult population, with regional differences; the use was higher among women, younger individuals, those with better schooling, higher income, healthier behaviors, better self-perceived oral health status, and who paid for their last dental treatment.

**Keywords:** Health surveys. Dental health services. Delivery of health care. Dental care. Health equity.

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**Conflict of interests:** nothing to declare – **Financial support:** Secretariat of Health Surveillance (TED 66/2018).

**RESUMO:** *Objetivo:* Descrever a prevalência do uso de serviços odontológicos no Brasil segundo as Unidades Federadas, sua relação com variáveis socioeconômicas e tipos de serviços, com base na Pesquisa Nacional de Saúde de 2019. *Métodos:* Trata-se de um estudo transversal de base populacional com dados da PNS 2019, que incluiu 88.531 participantes de 18 anos ou mais. Foram analisadas variáveis referentes ao uso de serviços de saúde bucal, segundo características sociodemográficas e comportamentais, por meio de análise multivariada, utilizando modelo regressão de Poisson com variância robusta. *Resultados:* A utilização de serviços odontológicos no ano anterior à entrevista foi maior entre os adultos (53,2%, intervalo de confiança — IC95% 52,5–53,9) do que entre os idosos (34,3%, IC95% 33,2–34,4). Na análise multivariada, o uso de serviços odontológicos foi maior em pessoas com maior nível educacional (razão de prevalência — RP=2,02, IC95% 1,87–2,18) e maior renda (RP=1,54, IC95% 1,45–1,64). Os estados das regiões Sudeste, Centro-Oeste e Sul apresentaram as maiores porcentagens de indivíduos que consultaram um dentista no último ano, entre 49,0 e 57,6% da população. *Conclusão:* Desigualdades no uso dos serviços de saúde bucal foram observadas na população adulta e idosa, com diferenças entre as regiões do país; foi identificado maior uso entre mulheres, indivíduos mais jovens, escolarizados e de maior renda, entre a população com melhores comportamentos relacionados à sua saúde, melhor percepção do seu estado de saúde, e aqueles que pagaram pelo último atendimento odontológico.

*Palavras-chave:* Inquéritos epidemiológicos. Serviços de saúde bucal. Assistência à saúde. Assistência odontológica. Equidade em saúde.

## INTRODUCTION

Providing access to dental care is a challenge for health systems. This challenge is a consequence of the high prevalence and incidence of oral diseases<sup>1</sup>, the size and distribution of the dental workforce, the financial resources available, and the low priority given to oral health in public health policies. The debate on access in Brazil is relevant because, although guaranteed by law, access to public health services remains selective, targeted, and exclusionary<sup>2-4</sup>.

In response to the low access to oral health services, in 2004, the Ministry of Health launched the National Oral Health Policy, which promoted an expressive advance in dental health coverage in Brazilian primary health care<sup>5</sup>. In addition, water fluoridation<sup>6</sup>, the advance of primary care through the Family Health Program, and the implementation of specialized services through dental specialty centers<sup>7</sup> are part of the strategies to reduce social inequalities in oral health<sup>8,9</sup>.

At the same time, it is essential to assess to what extent the actions of the National Oral Health Policy have reduced inequalities in the use of and access to dental health services among the different social groups<sup>2</sup>. Results of the 2003 National Household Sample Survey (*Pesquisa Nacional por Amostra de Domicílios* — PNAD) revealed that about 15.9% of the Brazilian population had never visited a dentist. In 1998, the proportion was 18.7%, representing a modest reduction in the five years evaluated. The 2003 PNAD also reported strong

regional inequalities in the use of dental services, with significantly greater proportions of people who had never visited a dentist in the North and Northeast regions of Brazil<sup>10</sup>. A comparison with 2008 PNAD data indicated an increased utilization of dental services in all ages between 1998 and 2008, especially among the poorest (first income quintile), pointing to a gradual decrease in access inequalities<sup>11</sup>.

The 2013 National Health Survey (*Pesquisa Nacional de Saúde* — PNS) also described higher access to dental health services since the 1998 PNAD, even though socioeconomic disparities persisted. In the 2013 survey, 74.3% of participants who declared seeking a dentist within the 12 months prior to the research used private services<sup>12</sup>.

Different studies indicate that the access to and use of health services in Brazil reflect the inequalities between distinct social groups<sup>13-15</sup>. Inequalities in the use of dental services have been associated with determinants such as gender and age, but also with variables that reflect inequities, such as income, schooling, having private insurance, and region of the country<sup>10,12</sup>. In addition, the universalization of public policy benefits and the distribution of resources to groups with greater needs are still scarce. This scenario creates a situation of inverse equity, in which low-income families and marginalized groups have difficulties in accessing services, while groups with better socioeconomic conditions are favored with greater public policy advantages<sup>16-18</sup>.

Therefore, analyzing whether the use pattern of dental services is changing in the country is crucial. This analysis is particularly relevant given the transformations that occurred in recent years in Brazil, with fiscal austerity measures<sup>19</sup>, and in the National Oral Health Policy after 2015, when a restrictive scenario was identified due to the lower implementation of new public dental health services and the significant reduction in important indicators, such as the initial dental examination<sup>20</sup>. In contrast, the private dental insurance market exploded, escalating from 2.6 million users in 2000 to 24.3 million in 2018, representing approximately a ten-fold increase<sup>21</sup>. Considering this scenario, the current study aimed to describe the prevalence of use of dental services in Brazil, evaluating its distribution across 26 states and the Federal District and its relationship with socioeconomic variables and types of service in the 2019 PNS.

## METHODS

This is a cross-sectional study using data from the 2019 PNS, a household survey with national representation. We adopted a three-stage cluster sampling, in which: the primary sampling units were census tracts or sets of tracts; the secondary sampling units were private households selected by simple random sampling; and the tertiary sampling units were selected residents aged 15 years or older. The interviews were conducted between August 2019 and March 2020, using mobile devices for data collection.

The 2019 edition of PNS held interviews in 94,114 households, from which individuals aged 15 years or older were randomly selected to answer the individual questionnaire.

Specific publications provide more details on the methodology<sup>22</sup>. This study included data from adults aged 18 or older (n=88,531).

The questionnaire was divided into three sections:

- a) household questionnaire;
- b) questionnaire related to all household members, answered by a resident aged 18 or older;
- c) individual questionnaire, answered by a resident aged 15 or older, selected by draw.

The 2019 PNS had 26 specific modules. Module U, corresponding to oral health, involves 19 specific questions. This study also considered questions from modules C – general characteristics of residents; I – health insurance coverage; J – use of health services; and P – lifestyles, related to adults aged 18 and older, and only those who answered the individual questionnaire were selected.

The outcome of interest of this study was the use of dental services in the previous year, assessed by the question: “When did you last visit a dentist?” Answers were categorized according to the use or not of dental services in the year prior to the interview (up to one year ago; over one year and up to two years ago; over two years and up to three years ago; over three years ago; never visited a dentist). The descriptive analysis also considered the type of dental service used, whether the participant directly paid for the dental appointment, and if they had dental insurance. Chart 1 (supplementary material) describes the baseline questions for the construction of the indicators employed.

## STATISTICAL ANALYSIS

Data analysis adopted sample weights for primary sampling units, households, and the selected resident, following the complex survey sampling<sup>22</sup>. Analyses were performed in the Stata software, version 14.0 (College Station, TX), using the survey module.

The descriptive analysis presented the general prevalence of sample characteristics, use of dental services in the previous year, last dentist appointment in the public service, direct payment for the last dentist appointment, and having dental insurance, according to exposure variables. Descriptive data are presented for the general sample of individuals aged 18 or older and also stratified by age (18–59 and  $\geq 60$ ).

For the distribution evaluation among the 26 states and the Federal District, we elaborated maps with the outcome prevalence in quartiles per state / Federal District. The cartographic basis was built with shapefiles, available at the website of the Brazilian Institute of Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística* — IBGE)<sup>23</sup>.

Subsequently, a multivariate analysis was performed using the Poisson regression model and robust variance to estimate crude and adjusted prevalence ratios (PR), their respective 95% confidence intervals (95%CI), and a 5% significance level, adopting the variable use of dental services in the previous year as the outcome.

The selection of covariates was based on Andersen's behavioral model<sup>24</sup>, which seeks to identify the determinants of health service use. According to this model, predisposing factors, facilitators, and health behaviors, as well as perceived and normative needs, act as determinants of health service use. Initially, we selected predisposing variables for the use of services, including demographic characteristics (gender and age), socioeconomic aspects (education and ethnicity), and health behaviors (smoking and use of toothbrush); followed by enabling variables, characterized as economic and organizational factors that allow the use of services (area and *per capita* household income); and, lastly, variables related to health care needs, divided into perceived (self-perceived oral health) and normative (dental loss)<sup>24</sup>.

Regarding predisposing factors, the variable gender was classified as male or female; age as adults (18 to 59 years) or older adults (60 years or older); schooling as illiterate, incomplete elementary school, complete elementary school, incomplete high school, complete high school, incomplete higher education, or complete higher education; ethnicity/skin color as white, black, multiracial/brown, Asian/yellow, or indigenous. Health behavior variables included: smoking, divided into yes (yes, daily; yes, less than daily) or no; and use of the toothbrush, with the options yes or no.

As for facilitators, area was categorized into urban or rural; and *per capita* household income into up to ¼ minimum wage, over ¼ and up to ½ minimum wage, over ½ and up to a minimum wage, over one and up to two minimum wages, over two and up to three minimum wages, over three and up to five minimum wages, or over five minimum wages.

Concerning necessity factors, self-reported dental loss considered the total number of teeth lost and was classified as no dental loss, loss of one to nine, ten to 19, or 20 or more teeth; and self-perceived oral health was divided into good (incredibly good or good) or poor (regular, poor, or very poor).

PNS data are available for public access and use at the official IBGE website (<https://www.ibge.gov.br/estatisticas/sociais/saude.html>). The National Research Ethics Committee (*Comissão Nacional de Ética em Pesquisa* — CONEP) approved PNS (3,529,376). The Informed Consent Form (ICF) was obtained at the interview.

## RESULTS

The final sample of this study comprised 88,531 participants aged 18 years or older who answered questions regarding dental care in the year before the interview. For specific questions, the loss rate was 16.2%, below the maximum expected (27.0%). Table 1 presents the sample characteristics and the prevalence of use of dental services. The rate was 78.4% among individuals aged 18 to 59 years, 43.8% among brown participants, and 86.2% among urban residents. A total of 48.2% of the sample used dental services in the previous year, among which 24.4% used public services and 60.1% paid for the appointment. Women and white people used dental services more often. The frequency of payment for dental appointments

was higher among white and yellow/Asian individuals. Regarding socioeconomic characteristics, 29.8% of the sample had completed high school, and most (51.1%) had a *per capita* household income of up to a minimum wage (Table 1).

Dental insurance was higher among white individuals (15.2%, 95%CI 14.5–15.9), those who lived in the urban area (14.5%, 95%CI 13.9–15.0), and with better schooling and income.

Table 1. Sample characteristics, prevalence of use of dental services in the year prior to the interview, last dentist appointment in the public service, direct payment for the last dentist appointment, and having dental insurance according to exposure variables. National Health Survey, 2019. n=88,531.

Variables	%*	Use of dental services in the year prior to the interview (95%CI)	Last dentist appointment in the public service (95%CI)	Direct payment for the last dentist appointment (95%CI)	Having dental insurance (95%CI)
Total prevalence	100	48.2 (47.6–48.8)	24.4 (23.5–25.2)	60.1 (59.1–61.0)	12.9 (12.4–13.3)
Gender					
Male	46.8	44.1 (43.2–45.0)	22.9 (21.7–24.1)	61.0 (59.7–62.4)	12.9 (12.3–13.6)
Female	53.2	51.7 (50.9–52.5)	25.5 (24.4–26.5)	59.3 (58.1–60.5)	12.8 (12.3–13.4)
Age (years)					
18–59	78.4	53.2 (52.5–53.9)	25.1 (24.2–26.1)	58.8 (57.8–59.8)	14.7 (14.1–15.3)
≥60	21.6	34.3 (33.2–34.4)	20.1 (18.6–21.7)	66.9 (65.0–68.8)	7.9 (7.3–8.5)
Formal education					
Illiterate	6.1	16.2 (18.0–20.6)	53.9 (49.9–57.9)	40.0 (36.2–44.0)	1.7 (1.3–2.2)
Incomplete elementary school	28.7	33.3 (32.4–43.2)	41.8 (40.0–43.6)	51.0 (49.1–52.9)	4.4 (4.0–4.8)
Complete elementary school	7.8	46.5 (44.7–48.4)	31.0 (28.0–34.1)	58.3 (55.1–61.5)	8.3 (7.3–9.3)
Incomplete high school	6.7	48.7 (46.5–50.8)	33.7 (30.6–36.9)	54.9 (51.5–58.3)	9.1 (7.7–10.8)

Continue...

Table 1. Continuation.

Variables	%*	Use of dental services in the year prior to the interview (95%CI)	Last dentist appointment in the public service (95%CI)	Direct payment for the last dentist appointment (95%CI)	Having dental insurance (95%CI)
Complete high school	29.8	55.3 (54.3–56.4)	22.2 (20.9–23.5)	62.0 (60.4–63.5)	15.7 (14.9–16.5)
Incomplete higher education	5.1	64.4 (61.9–66.9)	13.4 (11.5–15.7)	63.0 (59.7–66.3)	24.8 (22.6–27.2)
Complete higher education	15.8	71.8 (70.6–73.0)	7.5 (6.4–8.7)	68.5 (66.8–70.2)	28.8 (27.5–30.2)
Ethnicity/skin color					
Indigenous	0.5	40.6 (34.1–47.4)	42.7 (32.6–53.3)	44.1 (34.7–54.0)	9.3 (6.1–14.0)
Multiracial/brown	43.8	44.2 (43.3–45.0)	30.6 (29.2–31.9)	55.1 (53.8–56.5)	10.9 (10.3–11.5)
Asian/yellow	0.9	51.0 (45.1–56.9)	13.3 (7.5–22.4)	68.3 (59.1–76.3)	10.9 (7.9–14.7)
Black	11.5	43.3 (41.8–44.9)	30.3 (28.0–32.7)	54.9 (52.4–57.4)	11.8 (10.8–12.9)
White	43.3	53.3 (52.3–54.3)	17.9 (16.8–19.0)	65.3 (64.0–66.6)	15.2 (14.5–15.9)
Smoking					
Yes	12.6	38.8 (37.2–40.4)	32.1 (29.5–34.9)	55.0 (52.3–57.8)	8.6 (7.8–9.5)
No	87.4	49.6 (49.0–50.2)	23.5 (22.7–24.3)	60.6 (59.6–61.6)	13.5 (13.0–14.0)
Use of toothbrush					
No	1.4	15.8 (14.0–19.1)	54.8 (41.7–67.3)	40.8 (28.4–54.4)	3.1 (2.0–4.8)
Yes	98.6	48.7 (48.0–49.3)	24.2 (23.4–25.1)	60.2 (59.2–61.1)	13.0 (12.6–13.5)
Area					
Rural	13.8	35.8 (34.6–37.1)	48.6 (46.5–50.8)	46.9 (44.7–49.1)	3.1 (2.6–3.6)
Urban	86.2	50.2 (49.5–50.8)	21.5 (20.6–22.4)	61.6 (60.6–62.6)	14.5 (13.9–15.0)

Continue...

Table 1. Continuation.

Variables	%*	Use of dental services in the year prior to the interview (95%CI)	Last dentist appointment in the public service (95%CI)	Direct payment for the last dentist appointment (95%CI)	Having dental insurance (95%CI)
<i>Per capita household income</i>					
Up to ¼ MW	7.7	35.8 (34.2–37.4)	62.6 (59.6–65.5)	33.1 (30.3–36.1)	1.7 (1.3–2.3)
Over ¼ and up to ½ MW	14.3	39.2 (37.8–40.5)	47.9 (45.5–50.2)	43.7 (41.3–46.1)	4.0 (3.5–4.6)
Over ½ and up to 1 MW	29.1	40.5 (39.5–41.6)	32.4 (30.6–34.2)	56.4 (54.6–58.2)	7.4 (6.8–8.0)
Over 1 and up to 2 MW	28.2	48.8 (47.7–49.9)	17.7 (16.3–19.3)	65.1 (63.3–66.9)	14.5 (13.8–15.3)
Over 2 and up to 3 MW	9.1	59.9 (58.0–61.8)	9.8 (8.2–11.6)	69.7 (67.1–72.1)	21.8 (20.3–23.4)
Over 3 and up to 5 MW	6.4	66.5 (64.5–68.5)	6.6 (5.1–8.5)	69.6 (66.7–72.2)	27.1 (25.3–29.0)
Over 5 MW	5.2	73.5 (71.6–75.2)	2.7 (2.1–3.6)	71.6 (68.9–74.2)	31.4 (29.4–33.4)
<i>Dental loss</i>					
20 or more	13.0	19.7 (18.6–20.9)	34.0 (30.8–37.4)	58.9 (55.3–62.4)	4.1 (3.6–4.7)
10–19	7.9	40.6 (39.0–42.2)	33.7 (30.8–36.8)	56.6 (53.4–59.8)	7.6 (6.7–8.7)
1–9	50.9	55.1 (54.33–55.9)	24.2 (23.2–25.2)	60.6 (59.4–61.7)	14.0 (13.4–14.6)
None	28.2	54.6 (53.4–55.7)	20.9 (19.4–22.5)	60.1 (58.3–61.8)	18.1 (17.1–19.1)
<i>Self-perceived oral health</i>					
Poor	30.3	39.2 (38.2–40.2)	34.0 (32.5–35.6)	53.8 (52.2–55.5)	8.7 (8.2–9.3)
Good	69.7	52.1 (51.4–52.9)	21.2 (20.2–22.1)	62.1 (61.0–63.2)	14.7 (14.2–15.3)

\*Considering the sampling weight; 95%CI: 95% confidence interval; MW: minimum wage.



Most participants declared not smoking and using a toothbrush. A total of 50.9% had lost less than ten teeth, and 69.7% perceived their oral health as good; these individuals also visited the dentist more often, used fewer public services, and were less inclined to have dental insurance (Table 1).

The crude prevalence of dental care was higher among adults (53.2%) than older adults (34.3%), similarly to having dental insurance. The use of public dental services was greater in individuals who reported losing a higher number of teeth and considered their oral health poor, regardless of age, but with lower prevalence rates in the older population. The prevalence of direct payment for dental services was higher in the older population (Supplementary Tables 1 and 2).

After adjusting the estimates, women had an 18% higher prevalence (PR=1.18; 95%CI 1.15–1.20) of demand for dental services in the previous year. Prevalence of service use was greater in people with better educational levels and income, with no differences as to skin color (Table 2). Non-smokers presented a higher prevalence (PR=1.10; 95%CI 1.06–1.14) of dental service utilization in the previous year compared to smokers (Supplementary Table 3). Individuals who reported using a toothbrush had a greater prevalence (PR=1.34; 95%CI 1.12–1.61) of dentist visits than those who did not use it. Compared to those who lost 20 or more teeth, participants who lost 10 to 19 teeth showed an 85% higher prevalence

Table 2. Poisson regression models for the association between use of dental services in the year prior to the interview and exposure variables, National Health Survey, 2019. n=88,531.

Variables	Crude PR (95%CI)*	Adjusted PR (95%CI)†
Gender (ref.: male)		
Female	1.17 (1.14–1.20)	1.18 (1.15–1.20)
Age (ref.: 18–59 years)		
≥60	0.64 (0.62–0.66)	0.84 (0.82–0.87)
Schooling (ref.: illiterate)		
Incomplete elementary school	1.72 (1.60–1.86)	1.39 (1.29–1.49)
Complete elementary school	2.41 (2.23–2.61)	1.67 (1.55–1.81)
Incomplete high school	2.52 (2.33–2.73)	1.73 (1.59–1.88)
Complete high school	2.87 (2.67–3.07)	1.82 (1.69–1.96)
Incomplete higher education	3.34 (3.09–3.61)	1.97 (1.81–2.13)
Complete higher education	3.72 (3.47–3.99)	2.02 (1.87–2.18)

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Table 2. Continuation.

Variables	Crude PR (95%CI)*	Adjusted PR (95%CI)†
Ethnicity/skin color (ref.: indigenous)		
Multiracial/brown	1.08 (0.92–1.28)	1.04 (0.90–1.21)
Asian/yellow	1.25 (1.02–1.53)	1.04 (0.87–1.26)
Black	1.06 (0.90–1.26)	1.02 (0.87–1.19)
White	1.31 (1.11–1.55)	1.09 (0.94–1.27)
Area (ref.: rural)		
Urban	1.39 (1.34–1.45)	1.02 (0.99–1.06)
<i>Per capita household income (ref.: up to ¼ MW)</i>		
Over ¼ and up to ½ MW	1.09 (1.03–1.15)	1.07 (1.01–1.13)
Over ½ and up to 1 MW	1.13 (1.07–1.19)	1.16 (1.10–1.22)
Over 1 and up to 2 MW	1.36 (1.29–1.43)	1.28 (1.21–1.34)
Over 2 and up to 3 MW	1.67 (1.58–1.76)	1.44 (1.35–1.52)
Over 3 and up to 5 MW	1.85 (1.75–1.95)	1.49 (1.41–1.58)
Over 5 MW	2.05 (1.94–2.15)	1.54 (1.45–1.64)

\*Considering the sampling weight; †adjusted for behavioral and dental health factors. PR: prevalence ratio; 95%CI: 95% confidence interval; MW: minimum wage.

(PR=1.85; 95%CI 1.73–1.99) of using dental services, while for individuals who lost one to nine teeth, the rate was twice as high (PR=2.03; 95%CI 1.91–2.17). Individuals with good self-perceived oral health used dental services more often in the previous year (PR=1.15; 95%CI 1.16–1.19) (Supplementary Table 3).

The analysis of outcome distribution per state/Federal District indicated significant regional differences. States from the Southeast, Midwest, and — especially — South regions had the highest frequencies of dentist visits in the previous year — between 49.0 and 57.6% of the population. Amapá, Pará, and Rondônia (North region), as well as Maranhão, Piauí, and Ceará (Northeast region), had no more than 41.3% of the population receiving this type of care. The use of public services was higher (above 30%) in the North and Northeast regions, while it ranged from 10.1 to 22.2% in the Southeast region. Greater percentages of payment for dentist appointments and coverage by private dental insurance were identified in the Midwest, Southeast, and South regions, while in Northern and Northeastern states, this coverage reached less than 8% of the population (Figure 1).

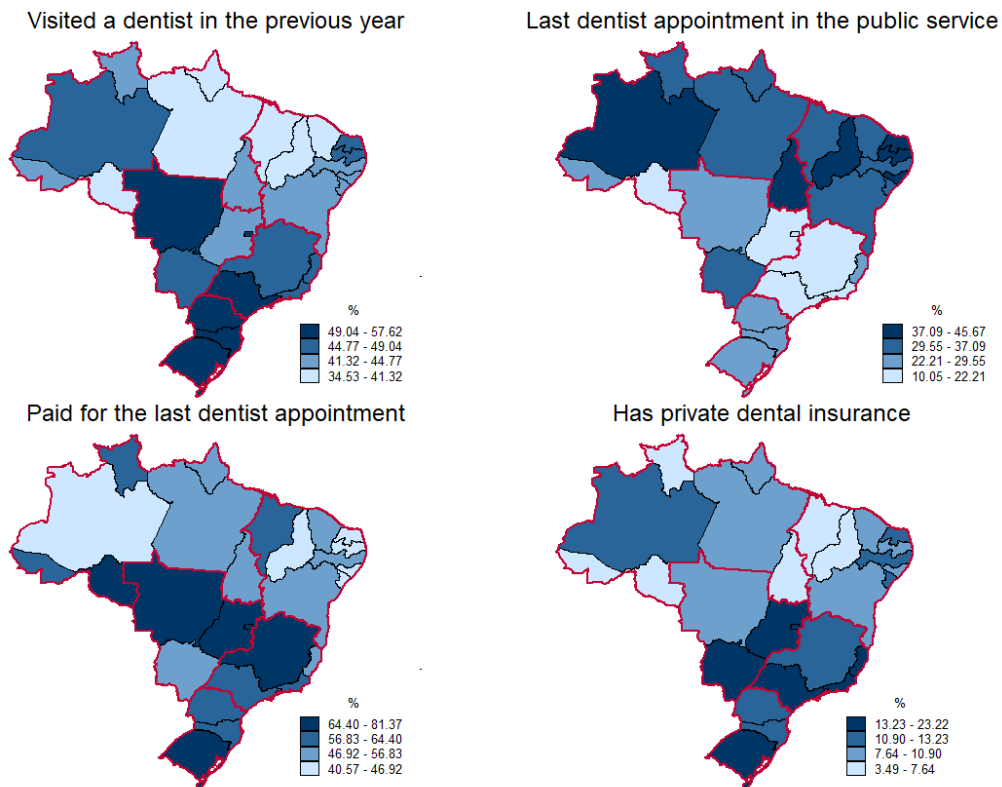


Figure 1. Prevalence of use of dental services in the year prior to the interview, last dentist appointment in the public service, direct payment for the last dentist appointment, and having dental insurance according to Brazilian macroregions, states, and Federal District, National Health Survey, 2019. n=88,531.

## DISCUSSION

This study presents the prevalence and characteristics of the use of dental health services in Brazil, in the different states/Federal District/regions, according to more recent data from the 2019 PNS. We identified a clear social gradient in the prevalence of dental care in the year before the interview and of payment for this care, which increased with socioeconomic strata, while the treatment in public services decreased in inverse proportion to having dental insurance.

The use of dental services in the year prior to the interview was 53.2% in adults and 34.3% among older adults, slightly higher than the rates found in a study using data from the 2013 PNS, whose prevalence of dentist appointments in the previous 12 months was 47.7% among adults and 29.4% in older adults. Regarding income, the prevalence of adults

who paid for dentist appointments or had dental insurance increased with socioeconomic strata, just as in the 2013 survey results<sup>25</sup>.

Universal and equal access to actions and services for health promotion, protection, and recovery, at all levels of complexity, is a fundamental right guaranteed to every Brazilian citizen<sup>26</sup>. The implementation of the National Oral Health Policy in Brazil, in 2004 led to increased access to dental services and the strengthening of Oral Health Teams in the Family Health Strategy<sup>27</sup>. Despite this progress, a recent study identified an upward trend in the funding of public oral health services in Brazil between 2003 and 2010 and stability from 2011 to 2018<sup>21</sup>. In contrast to the public financial crisis, the study shows that the coverage of dental-only insurance increased significantly between 2000 and 2018. The decreased financial transfer to public oral health services affected the use of this service in Brazil, reducing oral health indicators, such as the number of initial dental examinations<sup>20,21</sup>. In this scenario, social inequality also persists in oral health, perpetuating an exclusionary model that reproduces inequities in our country.

According to IBGE's Household Budget Survey from 2008 and 2009, the profile of Brazilians who had dental-only insurance was individuals with higher income and schooling. Among regional differences, São Paulo State had the highest expenditures, and Northern states, such as Amazonas and Tocantins, spent less on dental care<sup>28</sup>. With respect to the use of services in the 2013 PNS, differences were found in the proportion of dentist visits in the previous 12 months according to Brazilian regions — higher in the South region (51.9%) than the North region (34.4%). This study, based on 2019 data, identified similar results, indicating that the country's health inequities changed little during this period. The increased use of dental health services in the most developed regions of the country coincides with the highest percentage of expenditures with dentist appointments in these regions, demonstrating that oral care in Brazil still depends on private payment, thus suggesting the limits of the public health system (*Sistema Único de Saúde* — SUS) in reducing health-related social inequalities, especially regarding access.

We emphasize that the perceived need for treatment can also influence the demand for health services. The evaluation of access to and use of dental health services in Brazilian state capitals, based on data from the 2009 Vigitel telephone survey, revealed that 45% of interviewees reported needing treatment and that 15% of them were unable to receive care, with a greater proportion of need and non-treatment in Northern and Northeastern capitals. These results can be attributed to the lower professional activity in these regions, the high demand for treatment, and the larger portion of the population that depends on SUS, reflecting the structure and organization of dental care in Brazil, with lower availability of public dental services in certain regions<sup>29</sup>, suggesting the need to expand the services in these locations.

In the same study<sup>29</sup>, the lowest proportion of need for treatment was reported among older adults and those with less schooling. This fact could explain, at least in part, the lower access of the older population to oral health services since dental loss is still understood as a natural result of the aging process<sup>30</sup>, discouraging the older individual from seeking these services.

Regarding health costs, older adults usually had to pay for care, possibly given the type of treatment performed, which in many cases involved oral rehabilitation and procedures

not covered by SUS. Another research, which evaluated the private spending of Brazilians on dental care and oral hygiene products and used data from the 2008–2009 Household Budget Survey, found higher *per capita* expenditure on dental care in households with greater income, whose head of the family was aged 60 years or older and better educated<sup>28</sup>. We underline the importance of SUS in the care of populations with lower schooling and income, aiming at reducing health inequities<sup>8</sup>.

The limitations of the present study involve the data collected by the 2019 PNS. The survey excluded the homeless population and individuals living in nursing homes, groups with possibly low or no access to dental health services, which may indicate a scenario of even greater vulnerability than that presented in this study, especially among older populations. Data from geographical areas smaller than the state capitals were not estimated, and interviews were conducted with only one household resident. Moreover, the cross-sectional design of this study precluded us from making causal inferences.

In any case, we highlight that the work, performed with PNS data, allowed us to offer an overview of access to dental health services in Brazil, evidencing health inequities in the adult and older adult population, as well as according to states and regions of the country. Estimates show that approximately half of the Brazilian adults reported using some dental service in the year before the interview, with greater access among women, younger individuals, those better educated, and with higher income. Inequalities were also revealed by the greater use of services among the population with better health behaviors and perceived health status, as well as among those who can pay for treatment. These findings indicate that SUS still needs to advance in promoting access to dental care, especially in more vulnerable population groups and regions.

Analyzing and monitoring indicators of access to and use of health services through population-based surveys is crucial for elaborating effective public policies, contributing to the construction and improvement of SUS. The results of this study reinforce the importance of analyzing the information collected in population health surveys to guide policies or actions and promote greater equity in health access in Brazil.

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Received on: 05/19/2021

Reviewed on: 06/22/2021

Accepted on: 06/25/2021

Preprint on: 09/10/2021

<https://preprints.scielo.org/index.php/scielo/preprint/view/2921>

Authors' contributions: Fagundes, M. L. B.: formal analysis, data curation, writing – original draft, methodology. Bastos, L. F.: formal analysis, data curation, writing – original draft, methodology. Amaral Júnior, O. L.: formal analysis, data curation, writing – original draft, methodology. Menegazzo, G. R.: formal analysis, data curation, writing – original draft, methodology. Cunha, A. R.: formal analysis, data curation, writing – original draft, methodology. Stein, C.: formal analysis, writing – original draft, writing – review & editing, methodology. Abreu, L. G.: conceptualization, writing – original draft, writing – review & editing, methodology. Hugo, F. N.: conceptualization, writing – review & editing, methodology, validation. Giordani, J. M. A.: conceptualization, writing – review & editing, methodology, validation. Malta, D. C. M.: project administration, conceptualization, data curation, writing – review & editing, investigation, methodology, funding acquisition, validation. Iser, B. P. M.: conceptualization, writing – review & editing, methodology, supervision, validation.

