

DENTAL IMPLANTS IN THE BRAZILIAN PUBLIC HEALTH SYSTEM: REGIONAL DISPARITIES IN THE PROVISION OF OSSEOINTEGRATED DENTAL IMPLANTS IN THE UNIFIED HEALTH SYSTEM (2011–2025): AN ANALYSIS OF EQUITY AND SYMBOLIC POLICY

IMPLANTES DENTÁRIOS NO SUS: DISPARIDADE REGIONAL NA OFERTA DE IMPLANTES DENTÁRIOS OSSEOINTEGRADOS NO SISTEMA ÚNICO DE SAÚDE (2011-2025): UMA ANÁLISE DE EQUIDADE E POLÍTICA SIMBÓLICA

IMPLANTES DENTALES EN EL SISTEMA PÚBLICO DE SALUD DE BRASIL: DISPARIDADES REGIONALES EN LA OFERTA DE IMPLANTES DENTALES OSTEOINTEGRADOS EN EL SISTEMA ÚNICO DE SALUD (2011–2025): UN ANÁLISIS DE EQUIDAD Y POLÍTICA SIMBÓLICA



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ABSTRACT

Considering that the legislative universalization of dental implants in the Brazilian Unified Health System (SUS) does not necessarily translate into equitable access across the national territory, it becomes relevant to analyze the regional distribution of these procedures in Brazil. This study aims to analyze the regional distribution of osseointegrated dental implants provided by the SUS between 2011 and 2025, identifying regional inequalities and associated factors. To this end, an ecological time-series study with an observational and descriptive design was conducted using secondary data from official health information systems, including the Ambulatory Information System of the SUS (SIA/SUS), the National Oral Health Survey (SB Brasil 2023), and population data from the Brazilian Institute of Geography and Statistics (IBGE). The results show that 192,116 dental implants were recorded in the SUS during the study period, with a marked regional concentration. The South region accounted for 62.85% of all procedures, whereas the North region performed only 0.88%, despite presenting high prevalence of edentulism. Additionally, nine Brazilian states reported no implant procedures during the period analyzed. A moderate positive correlation was observed between the number of Specialized Dental Centers (CEOs) and implant production ($\rho = 0.563$; $p = 0.0022$), although this factor does not fully explain regional disparities. It is concluded that the provision of dental implants within the SUS remains unevenly distributed, reflecting structural factors and political decisions that influence the organization of specialized oral health services.

Keywords: Dental Implants. Health Equity. Unified Health System. Healthcare Disparities.

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RESUMO

Considerando que a universalização normativa dos implantes dentários no Sistema Único de Saúde (SUS) não necessariamente se traduz em acesso equitativo no território nacional, torna-se relevante analisar a distribuição regional desses procedimentos no Brasil. Objetiva-se analisar a distribuição da oferta de implantes dentários osteointegrados no SUS entre 2011 e 2025, identificando desigualdades regionais e fatores associados à sua ocorrência. Para tanto, procede-se a um estudo ecológico de série temporal, de natureza observacional e descritiva, baseado na análise de dados secundários provenientes do Sistema de Informações Ambulatoriais do SUS (SIA/SUS), da Pesquisa Nacional de Saúde Bucal (SB Brasil 2023) e do Censo Demográfico do Instituto Brasileiro de Geografia e Estatística (IBGE). Desse modo, observa-se que, no período analisado, foram registrados 192.116 implantes no SUS, com forte concentração regional: a Região Sul respondeu por 62,85% do total, enquanto a Região Norte realizou apenas 0,88% dos procedimentos, apesar de apresentar elevada prevalência de edentulismo. Além disso, nove unidades federativas não registraram produção de implantes no período. Verificou-se correlação positiva moderada entre o número de Centros de Especialidades Odontológicas (CEOs) e a produção de implantes ($p=0,563$; $p=0,0022$), embora essa variável não explique integralmente as diferenças regionais. Conclui-se que a oferta de implantes no SUS permanece marcada por desigualdades territoriais, refletindo fatores estruturais e decisões políticas que influenciam a organização da rede de atenção especializada em saúde bucal.

Palavras-chave: Implantes Dentários. Equidade em Saúde. Sistema Único de Saúde. Disparidades em Assistência à Saúde.

RESUMEN

Considerando que la universalización normativa de los implantes dentales en el Sistema Único de Salud (SUS) no necesariamente se traduce en un acceso equitativo en todo el territorio nacional, resulta pertinente analizar la distribución regional de estos procedimientos en Brasil. Este estudio tiene como objetivo analizar la distribución de la oferta de implantes dentales osteointegrados en el SUS entre 2011 y 2025, identificando desigualdades regionales y factores asociados a su ocurrencia. Para ello, se realizó un estudio ecológico de serie temporal, de carácter observacional y descriptivo, basado en el análisis de datos secundarios provenientes del Sistema de Información Ambulatoria del SUS (SIA/SUS), de la Encuesta Nacional de Salud Bucal (SB Brasil 2023) y de datos poblacionales del Instituto Brasileño de Geografía y Estadística (IBGE). Los resultados muestran que, durante el período analizado, se registraron 192.116 implantes dentales en el SUS, con una marcada concentración regional. La región Sur concentró el 62,85% del total de los procedimientos, mientras que la región Norte realizó apenas el 0,88%, a pesar de presentar alta prevalencia de edentulismo. Además, nueve estados brasileños no registraron procedimientos de implantes en el período estudiado. Se observó una correlación positiva moderada entre el número de Centros de Especialidades Odontológicas (CEO) y la producción de implantes ($p = 0,563$; $p = 0,0022$), aunque esta variable no explica completamente las desigualdades regionales. Se concluye que la oferta de implantes dentales en el SUS permanece marcada por importantes desigualdades territoriales, reflejando factores estructurales y decisiones políticas que influyen en la organización de los servicios especializados de salud bucal.

Palabras clave: Implantes Dentales. Equidad en Salud. Sistema Único de Salud. Desigualdades en la Atención Sanitaria.

1 INTRODUCTION

Oral health integrates general health and well-being, functioning as an indicator of social equity (ARDAKANI; BAYATI, 2025). Tooth loss, which may progress to edentulism, affects the quality of life and functional capacity of individuals (ALSHANBARI, 2025; MORA ROJAS et al., 2025; SILVA; OLIVEIRA; LELES, 2015). Osseointegrated dental implants have become the standard for oral rehabilitation, offering better stability, function, and aesthetics than conventional prostheses (BHALERAO; KUMAR, 2025). Historically, high cost has restricted access to health for populations with lower social determinants, perpetuating health inequalities (ABBAS et al., 2019).

In universal health systems such as SUS, the inclusion of implants represents an advance in the search for Universal Health Coverage (GHONEIM et al., 2022). The Smiling Brazil program has expanded access to dental care, recognizing the need for rehabilitative services. The provision of implants by the SUS is essential to address persistent disparities in Brazilian oral health (FALKNER; AMIRLOO, 2025).

However, the implementation of programs in countries with large territorial extension and regional disparities faces challenges in the uniform distribution of resources (GHANBARZADEGAN et al., 2021). Even in systems with comprehensive coverage, factors such as income and education influence access (TCHICAYA; LORENTZ, 2014). The geographic distribution of implants in the SUS reflects the effectiveness of the program in achieving equity. Ordinance No. 718/SAS/MS of 2010, which implemented code 04.14.02.042-1, allowed any SUS user to perform the procedure in qualified units.

This study analyzes the regional distribution of osseointegrated dental implants in the SUS between 2011 and 2025, based on data from the SIA/SUS. It seeks to quantify the supply by Federation Unit (FU), identify patterns of regional concentration and examine the temporal evolution of production. It also compares the prevalence of edentulism with the effective supply of implants, in order to assess the degree of equity in access and identify political and structural factors associated with the observed inequality.

2 THEORETICAL FRAMEWORK

Oral health is an important component of general health and an indicator of social inequalities, and tooth loss is a relevant problem, with significant functional and psychosocial impacts. In this context, osseointegrated dental implants have been consolidated as a therapeutic standard for oral rehabilitation, offering better clinical results compared to conventional prostheses.

Historically, access to implant dentistry has been restricted to groups with higher purchasing power, contributing to the maintenance of health inequities. The incorporation of this procedure into the Unified Health System (SUS), based on Ordinance No. 718/2010, represents an advance in the expansion of comprehensive oral health care. However, the literature shows that the expansion of supply occurs unevenly, influenced by structural and organizational factors and by the management capacity of services.

The National Oral Health Policy, through the Smiling Brazil program, expanded specialized care with the implementation of Dental Specialty Centers (CEOs). Even so, studies indicate that the distribution of these services and the supply of rehabilitation procedures remains heterogeneous, reflecting regional inequalities in access to secondary care.

From a theoretical perspective, the normative universalization of implant dentistry can be interpreted in the light of the concept of symbolic policy, in which the legal provision of universal access does not necessarily translate into an effective guarantee of access. This dissociation between norm and practice highlights limitations in the implementation of public policies and in the equitable allocation of resources.

From an epidemiological point of view, despite the reduction in edentulism in recent decades, the need for oral rehabilitation remains high, especially in vulnerable populations. Studies based on data from DATASUS show growth in the supply of implants in the SUS, but with a strong regional concentration and insufficiency in the face of the existing demand.

Although clinical evidence indicates that implants performed in the SUS have satisfactory results and a positive impact on quality of life, there are still gaps related to equity of access and the organization of services. Thus, the literature points to the need for analyses that integrate epidemiological, structural, and political aspects, in order to understand inequalities in supply and support the improvement of public policies in oral health.

3 METHODOLOGY

3.1 GENERAL OBJECTIVE

To analyze the regional distribution of the supply of osseointegrated dental implants in the SUS in Brazil, between the years 2011 and 2025, identifying possible regional inequalities related to their occurrence.

3.2 SPECIFIC OBJECTIVES

- To quantify the production of osseointegrated dental implants in the SUS between 2011 and 2025, according to the State and major regions of Brazil.

- To analyze the regional distribution of the supply of dental implants, identifying patterns of concentration or low supply among the FUs.
- To compare the supply of dental implants with the epidemiological need, considering the prevalence of edentulism in the different regions of Brazil.
- To examine the association between the installed capacity of the specialized oral health network and the production of implants, using the number of Dental Specialty Centers (CEOs) per state.

3.3 TYPE OF STUDY

This is an ecological time series study, observational and descriptive, with a quantitative approach, based on the analysis of secondary data from official health information systems to investigate the distribution of the supply of osseointegrated dental implants in the SUS in Brazil.

3.4 DATA SOURCES

The data used in this study were extracted from official sources and in the public domain:

- SIA/SUS: provided data on the production of osseointegrated dental implants from the SUS Procedures, Medications, and OPM Table Management System (SIGTAP), code 0414020421, by state and major geographic regions of Brazil, from 2011 to 2025.
- SB Brazil 2023: used to obtain the prevalence of edentulism among older adults aged 65 to 74 years by major geographic regions of Brazil, serving as an indicator of epidemiological demand.
- 2022 Demographic Census of the Brazilian Institute of Geography and Statistics - (IBGE): provided population data by major geographic regions of Brazil and UF, used to calculate rates per 100 thousand inhabitants.

3.5 STUDY PERIOD

The analysis covers the 15-year period, from 2011 to 2025.

3.6 VARIABLES ANALYZED

The main variables analyzed were:

- Number of osseointegrated dental implants: Absolute number of procedures registered in the SIA/SUS.

- Prevalence of edentulism: Percentage of edentulous elderly in the age group of 65-74 years, by state.
- Implant rate per 100 thousand inhabitants: Calculated by dividing the total number of implants by the number of inhabitants of the major geographic regions of Brazil/UF, multiplied by 100,000.

3.7 ANALYSES PERFORMED

The analyses were conducted using the following approaches:

1. Descriptive Analysis: Distribution of implant production (SIGTAP 0414020421) by major geographic regions of Brazil and UF, using absolute (n) and relative (n over the national total) frequencies;
2. Time Series Analysis: Evaluation of the annual evolution of implant production in Brazil and by major geographic regions of Brazil; e
3. Correlation Analysis: Analysis of the association between epidemiological need (prevalence of edentulism) and the supply of implants in the SUS.

3.8 INCLUSION AND EXCLUSION CRITERIA

- Inclusion Criteria: All osseointegrated dental implant procedures registered in the SIA/SUS under the code SIGTAP 0414020421, performed between 2011 and 2025, in all regions and FUs of Brazil, were included;
- Exclusion Criteria: Procedures with SIGTAP codes other than the specified ones were excluded.

4 RESULTS AND DISCUSSIONS

In the period between 2011 and 2025, 192,116 osseointegrated dental implants were registered within the scope of the SUS (Table 1), according to data extracted from the SIA/SUS. Considering the Brazilian population of 203,080,756 inhabitants, according to the 2022 Demographic Census, this volume corresponds to a rate of 94.6 implants per 100 thousand inhabitants over the period analyzed, with an approximate annual average of 6.3 implants per 100 thousand inhabitants (Table 2).

Table 1*Production of Implants in the SUS (2011-2025)*

Grandes Regiões Geográficas do Brasil	Número absoluto de implantes realizados (2011-2025)	Participação (%)
Região Sul	120.740	62,85%
Região Nordeste	34.129	17,76%
Região Centro-Oeste	20.159	10,49%
Região Sudeste	15.399	8,02%
Região Norte	1.689	0,88%
Total Brasil	192.116	100,00%

Source: Adapted from TabNet data (2025).

Table 2*Implant Rate per 100,000 Population (2011-2025)*

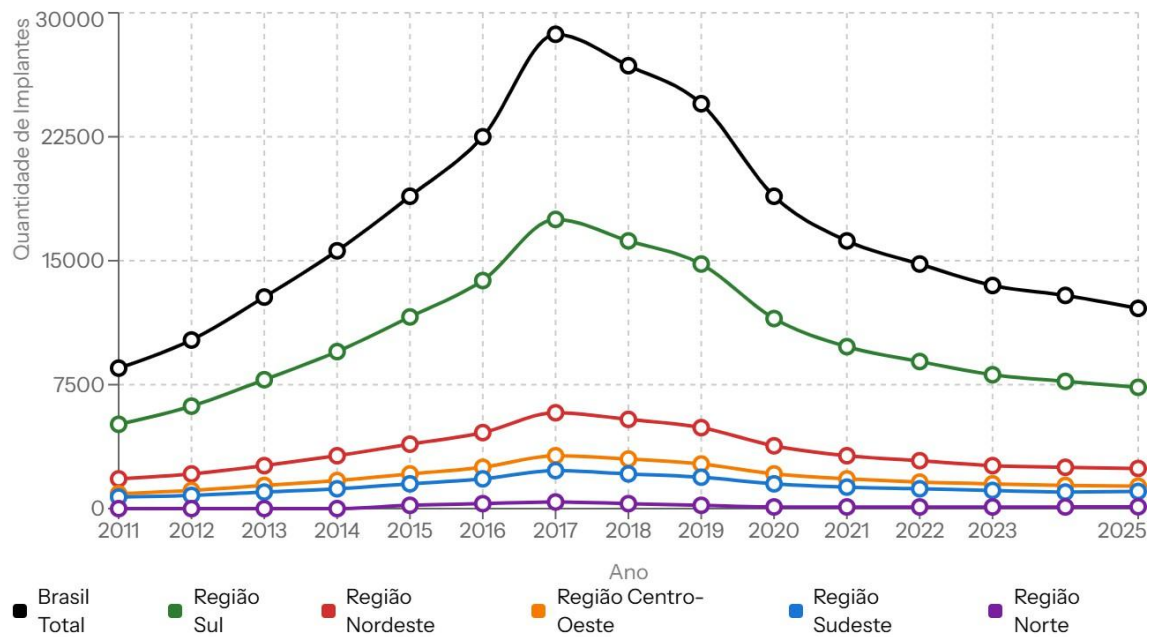
Grandes Regiões Geográficas do Brasil	População (Censo 2022)	Implantes (2011-2025)	Taxa de Implantes SUS por 100k Hab/ano	% do Total de Implantes
Região Norte	17.354.884	1.689	0,65	0,88%
Região Sudeste	84.840.113	15.399	1,21	8,01%
Região Nordeste	54.658.515	34.129	4,16	17,76%
Região Centro-Oeste	16.289.538	20.159	8,26	10,49%
Região Sul	29.937.706	120.740	26,89	62,85%
Brasil	203.080.756	192.116	6,31	100,00%

Source: Adapted from 2022 Census and TabNet data (2025).

The time series of the production of osseointegrated dental implants in the SUS between 2011 and 2025 shows continuous growth until 2019, followed by an abrupt drop in 2020, compatible with the impact of the COVID-19 pandemic on elective procedures (Figure 1). There is a partial recovery in subsequent years, with no return to the pre-pandemic peak, and a trend of stabilization or decline from 2023 onwards. The South Region maintained consistent leadership throughout the period, while the North and Central-West showed reduced production, evidencing the persistence of regional inequalities in the execution of the policy. These findings indicate that the initial expansion of supply was not consolidated in a sustainable and equitable manner in the national territory.

Figure 1

Time Series Evolution of Dental Implant Production in SUS (2011-2025)

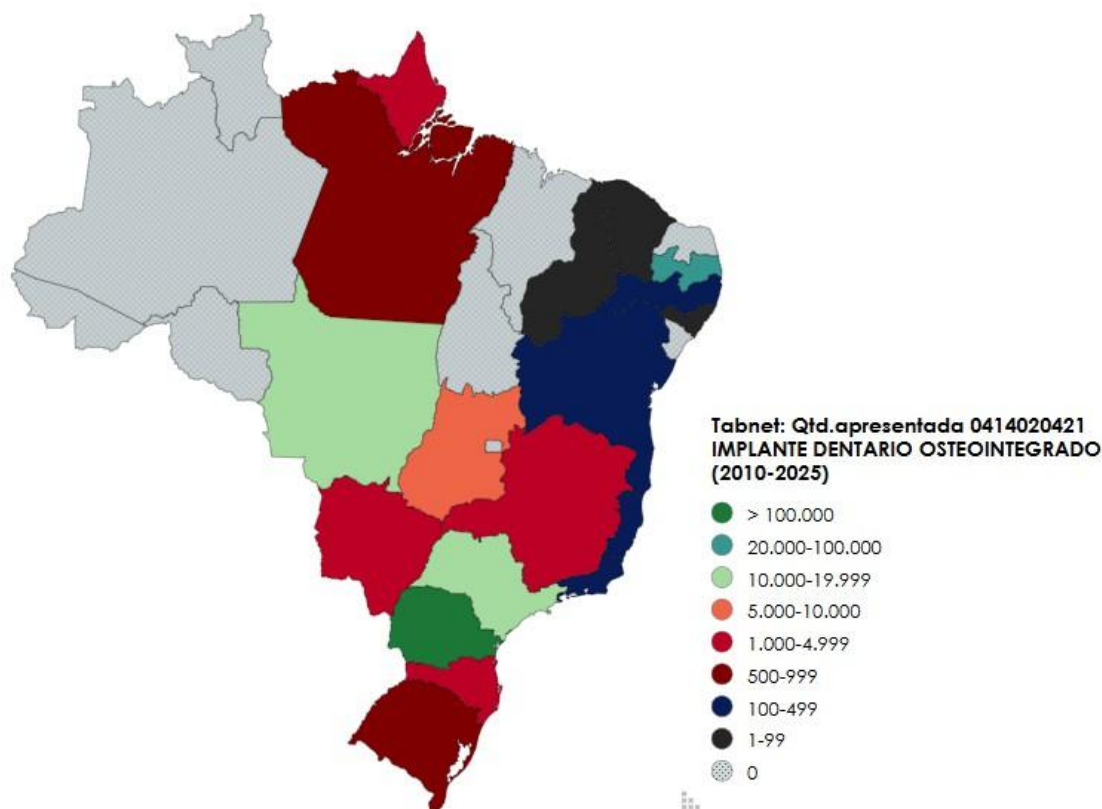


Source: Adapted from TABNET data (2025).

The distribution of dental implant production showed heterogeneity among the FUs. Of the total of 27 states, only a restricted number presented consistent production records over the period analyzed. It was observed that production was mostly concentrated in a few states, while nine of the FUs had zero or residual production in the SIA/SUS (Figure 2).

Figure 2

All number of implants performed registered in the SIA/SUS 2011-2015



Source: Elaborated by the authors.

In the time frame from 2011 to 2015, fifteen FUs presented records of approved dental implants. In this period, the states of Paraná, São Paulo and Mato Grosso do Sul concentrated the highest absolute volumes of production, while Minas Gerais, Espírito Santo and Rio Grande do Sul recorded reduced quantities. The other FUs did not present production records in the analyzed period (Figure 2).

This geographic imbalance is aggravated by a misalignment between the epidemiological demand and the provision of oral health rehabilitation services, directly violating the fundamental principles of universality and equity of the SUS. While the North Region, population between 65 and 74 years old, faces a high prevalence of edentulism (39.95%), it received only 0.88% of the national implants, representing a variation of -95.60% below the expected. In contrast, the South Region, with the lowest prevalence of edentulism (35.54%), concentrated 62.85% of the implants, resulting in a variation of +214.35% above its epidemiological need (SB Brasil, 2023). Such structural and systematic disparity perpetuates cycles of path dependency, where regions that have historically invested in implant dentistry consolidate advantages, relegating others to persistent exclusion. This scenario aligns precisely with Murray Edelman's (1985) concept of "symbolic politics," where

the promise of universal access functions as a powerful symbol of state legitimacy and commitment to equity, but masks a profoundly unequal material reality. The legislative guarantee, therefore, operates more as a mechanism of public appeasement than as an effective instrument of social transformation.

Regarding the installed capacity of the specialized oral health care network, there was a wide variation in the number of CEOs among the states. States such as São Paulo, Paraíba and Minas Gerais had a high absolute number of CEOs, while other FUs had significantly lower numbers (Table 3). The joint analysis of the number of CEOs and the production of dental implants, in the October 2025 period, showed a lack of direct correspondence between these variables. States with a higher number of DSCs did not necessarily have a higher production of dental implants, while some FUs with a lower number of services concentrated higher volumes of procedures.

An ecological analysis was conducted with the 27 FUs, using secondary data from TabNet, competence November 2025, referring to CEOs, and from SIA/SUS, from January 2011 to May 2025, referring to the Osseointegrated Dental Implant procedure (SIGTAP code 0414020421) as shown in Table 3. The association between the number of DSCs per state and the accumulated volume of implants performed was estimated using Spearman's correlation coefficient. A positive correlation was observed (ρ Spearman = 0.563; $p = 0.0022$), indicating a monotonic association between installed capacity and production of the procedure (Figure 3). However, far from a strong correlation, suggesting that the presence of CEOs does not fully explain the variation in production between FUs. The dispersion observed suggests that the availability of specialized services does not fully explain the variation in production among the FUs, pointing to the influence of additional structural and organizational determinants.

Table 3*Number of CEOs by State with Total and Average Implants*

UF	Nº de CEOs Recorte 2025	Total Implantes Janeiro de 2011 a maio de 2025	Média anual de Implantes
Acre	2	0	0,00
Alagoas	26	42	2,91
Amapá	4	1.173	81,36
Amazonas	13	0	0,00
Bahia	85	127	8,81
Ceará	83	6	0,42
Distrito Federal	14	0	0,00
Espírito Santo	11	354	24,55
Goiás	43	6.701	464,81
Maranhão	33	0	0,00
Mato Grosso	15	10.198	707,38
Mato Grosso do Sul	20	3.260	226,13
Minas Gerais	112	1.061	73,60
Paraná	52	119.101	8.261,34
Paraíba	115	33.723	2.339,17
Pará	40	516	35,79
Pernambuco	83	189	13,11
Piauí	36	42	2,91
Rio de Janeiro	87	499	34,61
Rio Grande do Norte	39	0	0,00
Rio Grande do Sul	40	592	41,06
Rondônia	8	0	0,00
Roraima	2	0	0,00
Santa Catarina	49	1.047	72,62
São Paulo	208	13.485	935,38
Sergipe	13	0	0,00
Tocantins	7	0	0,00

Source: Adapted from TabNet data (2025)

between symbol and reality is not accidental, but functional: it allows the State to maintain legitimacy through symbols of equity, while avoiding adequate budgetary contributions to implement genuine universalization (Edelman, 1985). Implant politics thus produces symbols of equity and universality that legitimize the state, while the actual material effects remain unequal.

National epidemiological data reinforce that, despite the progressive reduction of edentulism, tooth loss still represents an important public health problem, especially among adults and the elderly. The report, SB Brasil 2023, shows that the need for oral rehabilitation remains high, especially in socially vulnerable populations, which justifies the incorporation of more problem-solving rehabilitation strategies within the scope of the SUS (BRASIL, 2025). In this context, implant dentistry emerges as a therapeutic alternative capable of promoting functional, aesthetic and psychosocial gains superior to those observed with conventional removable prostheses.

Descriptive studies based on data from DATASUS (Department of Informatics of the Unified Health System) show that the supply of dental implants in the SUS has increased since its regulation, but in an uneven and still limited way. Almeida et al. (2016) identified that, in the period from 2011 to 2014, the South Region concentrated most of the procedures performed in the country, while regions such as the North and Northeast had minimal or non-existent supply. These findings show important regional inequalities in access to implant dentistry, reflecting differences in the installed capacity of services, financing, and organization of the secondary care network.

More recent analyses confirm the persistence of this scenario of inequality. Kinalski et al. (2020) observed that, although implant treatment is formally available throughout the national territory, production remains concentrated in a few states and municipalities, especially in the South Region. In addition, the authors emphasize that the number of procedures performed over the last decade is still insufficient in view of the population demand, indicating that implantology in the SUS remains an incipient public policy.

At the state level, specific studies reinforce these limitations. Rocha, Souza and Reis (2023), when analyzing the supply of implant dentistry procedures in Minas Gerais, identified that, in more than a decade of the policy's validity, only a small number of municipalities performed dental implants and prostheses on implants. Such concentration compromises equitable access to treatment and highlights difficulties related to infrastructure, costing, and the organization of specialized services. Similar results were observed in the state of Paraná, where, despite the progressive growth in production, the supply still does not meet the pent-up demand for oral rehabilitation (BIN et al., 2019).

From the clinical perspective, the literature indicates that rehabilitation treatments with implant-supported prostheses performed in the SUS present satisfactory results and success rates compatible with those observed in private practice, provided that technical criteria, adequate protocols and correct patient selection are respected. Analyses indicate that rehabilitation with implants promotes reestablishment of masticatory function, improvement of phonetics, stimulation of bone regeneration and positive impact on the self-esteem and quality of life of users (SILVA; BUGANÇA; LUCIO, 2023).

In the context of the aging of the Brazilian population, the relevance of implant dentistry in the SUS becomes even more evident. Vernizi and Loyola (2013) highlight that the Brazilian elderly have unsatisfactory oral health conditions and that implant-supported prostheses can provide a significant improvement in the quality of life of this population. However, the authors emphasize the need for more consistent evaluations of the cost-effectiveness and sustainability of the policy, especially considering the increased demand for oral rehabilitation associated with the aging of the population.

Thus, implantology in the SUS should be understood as a public policy in the process of consolidation. Strengthening this strategy requires regionalized planning, systematic monitoring of production, expansion of funding, and effective integration with the other actions of the National Oral Health Policy. The responsible expansion of the supply of dental implants has the potential to reduce historical inequities in oral health and contribute to the implementation of the principles of universality, integrality and equity that guide the SUS.

5 CONCLUSION

The analysis shows that the normative universalization of implant dentistry in the Unified Health System has not been converted into effective and equitable access in the national territory. Based on SIA/SUS data in the period from 2011 to 2025, there is a high concentration of production in the South Region, especially in the state of Paraná, while there is a lack of supply in nine federative units, configuring a concrete restriction on access to this oral health care.

In addition, the expressive performance of Paraíba, even in the face of lower relative economic capacity, indicates that the disparities observed are not explained exclusively by financial factors, but reflect, above all, differences in political prioritization and in the capacity to organize and manage services. The pattern of internalization of supply in Paraná, contrasting with the absence of production in capitals with consolidated infrastructure, reinforces the inadequacy of explanations based only on technical or structural limitations.

In view of these findings, it is concluded that the expansion of access to implant dentistry in the SUS requires the adoption of coordinated strategies of federal induction, with equitable redistribution of resources, definition of care priorities and establishment of systematic mechanisms for monitoring regional inequalities. Such measures are fundamental to transform the legal provision into concrete access, ensuring greater equity in the provision of services and bringing public policy closer to the constitutional principles of universality and integrality of health care.

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