

Economic crisis, austerity and its effects on the financing of oral health and access to public and private services

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Abstract *The present study analyzed the effects of austerity and economic crisis on the financing of oral health, provision and use of public services and access to exclusively dental plans in Brazil, from 2003 to 2018. A retrospective, descriptive study was carried out, with a quantitative approach. Data were collected from the National Health Funding database, the National Supplementary Health Agency, the Strategic Management Support Room, and from the e-manager system. The federal fund-to-fund transfer was increasing from 2003 to 2010 and remained stable from 2011 to 2018. The supply decreased at the end of the period, with reduced coverage of the first programmatic dental appointment, average supervised tooth brushing and number of endodontic treatments. Against the background of the public financial crisis, exclusively dental plan companies expanded the market from 2.6 million users in 2000 to 24.3 million in 2018, with a profit of more than R\$ 240 million. Fiscal austerity has a strong influence on the use of public dental services in Brazil, which can benefit the private market and widen inequalities.*

Key words *Healthcare Financing, Health Policy, Oral Health.*

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Introduction

Austerity policies can have devastating effects on the health of populations¹. Austerity is a recent neoliberalist strategy that imposes sacrifice by decreasing expenses or state structural needs². However, unlike the moral sense of virtue attributed to the frugal use of resources in the individual budget, in neoliberalism, austerity accentuates the unfair use of resources, the concentration of income and undermines growth and job creation, without affecting the entrepreneurs' profits^{2,3}.

The effects of austerity policies on health have been investigated. Stukler *et al.*⁴ analyzed the 2008 financial crisis in European countries and pointed to an increase in suicide cases in Greece, Ireland and Latvia. Increased dissatisfaction with health care and reduced public spending were related to the 2008 financial crisis in Greece and Portugal⁵. Also in Europe, as of 2010, when austerity measures were also implemented in health service reduction, an increasing need for health services was observed, and a large number of people who experienced difficulty in having access to these services. The closing of institutions, reduction of opening hours and number of professionals were also observed⁶.

In health systems with universal coverage, such as Germany, the United Kingdom and Spain, after the European financial crisis of 2008, there were changes and reforms to meet economic pressures, aiming at expanding restrictive measures, reducing State intervention and expanding market space⁷.

Currently, Malta *et al.*⁸ have verified a tendency of effect of austerity measures to reach the goals for the control of non-communicable chronic diseases in Brazil. Also as a reflex of the economic crisis and the successive financial cuts in the health sector in Portugal as of 2011, Baradas and Nunes⁹ verified difficulties in accessing the means of diagnosis and treatment for cancer patients. Severe consequences in warranting social public policies, especially aimed at young individuals, have also been experienced in Spain since 2014.

In Brazil, the 2008 financial crisis, related to the international crisis, was characterized by the "outflow of foreign capital invested in the stock market; reduction of external credit offer to banks and companies; increased remittance of profits and dividends by subsidiaries of multinational companies; decrease in the domestic banking credit market; and 'pooling' of liquidity in

the interbank market"¹⁰. The government developed rapid response strategies based on several measures that resulted in the economic recovery as of mid-2009¹⁰. Another period considered of economic crisis is from 2014 to 2016. After the second quarter of 2014, the Brazilian economy was "in a recession" due to the sharp fall in investment spending, reduction in non-financial corporations' profit margins, price realignment, fiscal retraction, reduction in the structural primary result¹¹, tax collection decrease at all government levels and unemployment rate increase².

It is noteworthy the Constitutional Amendment (CA) No. 95, approved in 2016, which established a spending ceiling for primary expenses, with only an annual correction to recover inflation losses². This CA may have negative impacts on health financing and guaranteeing the right to health access in Brazil¹². Some studies have already indicated a drop in the supply of public health and oral health services in Brazil in the recent period¹³. However, no studies were found that investigated health or oral health indicators in Brazil related to the financial crisis and government austerity measures. Therefore, the present study analyzed the effects of austerity and the economic crisis on oral health financing, the use of public services and access to exclusively dental supplementary health in the recent period.

Method

A retrospective, descriptive study was carried out, with a quantitative approach, of the effects of austerity in Brazil, from 2003 to 2018, on the financing of oral health, the provision of public services and access to exclusively oral health plans. The study will adopt the periods of 2008 and 2014 to 2016 as those related to the economic crisis already demonstrated in studies in the economic area. This study is the product of a doctoral thesis by one of the authors on National Oral Health Policy developed at the Aggeu Magalhães Research Center/PE and the monitoring carried out by the Health Policy Observatory of Instituto de Saúde Coletiva da Universidade Federal da Bahia.

To analyze the federal funding, data were collected from the National Health Funding database regarding the transfers made in the oral health-related headings from 2003 to 2018, according to the methodology adapted from Rossi *et al.*¹⁴. From 2003 to 2017, resources for oral health were divided into three blocks: primary

care, medium and high-complexity and management, administered by the National Health Funding (FNS, *Fundo Nacional de Saúde*).

In FNS, financial transfers were designated by financing blocks. In funding, the federal financing block of Primary Care (PC) for the states, Federal District (DF) and municipalities is subdivided into: a) OHT – Mobile Dental Unit (MDU); b) Additional OH Incentive; and c) Oral Health. Funding for federally-affiliated providers includes: a) additional incentive Mobile Dental Unit and b) Oral Health. There was a medium and high-complexity funding block consisting of a) Municipal Dental Specialties Center (DSC); b) State DSC and c) Strategic Action and Compensation Funds (SACF) of several types. The investment block (capital) had the specific heading of Oral Health actions in the components ‘Primary Care in Oral Health’ (Acquisition of equipment and permanent material) (2010–2011); ‘Implementation of health actions and services’ (Implementation of the Dental Specialty Center – DSC) (2011–2017) and ‘Variable Primary Care Floor’ (Acquisition of dental equipment) (2012–2013, 2016–2017). From 2004 to 2009, the investment related to the implantation of Dental Specialties Centers was included in the SUS Management block, under the heading “Implementation of health actions and services” (Additional incentive to the DSC). Thus, regardless of the block into which they were included, capital resources were considered as investments for the implementation of services.

In the year 2018, with the change of federal transfers into capital blocks and financing, resources destined to Oral Health in Primary Care were part of the component “Primary Health Care Floor”, in the “Oral Health Care Financing” program. The capital resources were included in the “Primary Health Care Service Network Structuring”, in the Program for Oral Health Care Structuring; however, the transfers for specialized care were not available at the consulted database.

The financing analysis was performed according to capital transfers and financing in primary care, specialized care, and investments. All figures were corrected by the index that measures official inflation in the country, the Extended National Consumer Price Index (IPCA, *Índice Nacional de Preços ao Consumidor Amplo*), for December 2018, for comparability purposes. This index is calculated by the Brazilian Institute of Geography and Statistics (IBGE, *Instituto Brasileiro de Geografia e Estatística*). The correction of the val-

ues was performed using the official calculator of the Central Bank of Brazil, available at: <https://www3.bcb.gov.br/CALCIDADAO>.

The coverage of exclusively dental plans, their revenues and expenses, from 2003 to 2008 (until October 2018, as the months of November and December were unavailable) were collected from the open access databases of the National Supplementary Health Agency (ANS, *Agência Nacional de Saúde Suplementar*), available at www.ans.gov.br.

The supply of public dental services was analyzed based on the number of implemented Oral Health Teams (OHT), their population coverage and the number of Dental Specialty Centers (DSC). These data were available from the Strategic Management Support Room (SAGE, *Sala de Apoio à Gestão Estratégica*), at www.sage.saude.gov.br, and from the Ministry of Health (MoH) e-manager system, at <https://egestorab.saude.gov.br>. Data regarding DSC implemented in 2018 were provided by the General Coordination of Oral Health/MoH.

To analyze the use of public services in primary care, the coverage indicators of the first programmatic dental appointment and the mean of supervised tooth brushing were used. For specialized care, indicators of completed endodontic treatments and periodontal procedures were used, available from 2008 until November 2018. The calculation related to the indicator of completed endodontic treatments, characterized as outpatient procedures at the Dental Specialty Centers was based on the sum of the absolute number of procedures related to obturation of permanent teeth with one, two, three or more roots and root perforation sealing (codes in SIA-SUS: 03.07.02.006-1, 03.07.02.004-5, 03.07.02.005-3, 03.07.02.011-8). The periodontal procedures analyzed gingivectomy, gingivoplasty, periodontal surgical treatment – by sextant, they appear in SIA-SUS with the following codes: 0414020081, 0414020154, 0414020162, 0414020375, respectively. Periodontal procedures are typical referral procedures for specialist care and are the minimum specialty established for the DSC. For 2018, data were available only up to the month of November. Oral diagnostic procedures, oral and maxillofacial surgery and care for patients with special needs were not included.

The data were organized using the csv extension in Microsoft Office Excel 2010 software and later analyzed using the program Stata, version 15. After the descriptive analysis, the trend of the indicators was estimated using the Prais-Win-

stein method. As the period covered by the present study is of 15 years, for the sake of further details, we estimated the trends from 2003 to 2010 and from 2011 to 2018, considering the limitation of period analysis with a smaller number of observations by the method of choice. The annual percentage change (APC) was calculated with the respective 95% confidence interval (95%CI) of indicators related to the transfer of resources, use of primary and specialized care services. The trend was considered to be decreasing when the coefficients were negative, increasing when positive and stable when the regression coefficients were not significantly different from zero ($p > 0.05$).

Results and Discussion

The financial transfers made by the Federal Government to states and municipalities from 2003 to 2018 showed an increase until 2013, a maintenance of values from 2013 to 2016 and reduction from 2017 onward, with a large decrease in 2018 (Table 1). The 2008 financial crisis, which

showed a rapid recovery by the Federal Government, did not reflect on oral health financing during that period.

However, one can observe the severe effects of the 2014-2016 economic crisis on the amount of financial resources transferred by the Federal Government to the states and municipalities for oral health. With the values corrected by the IPCA, it can be observed that the total transferred in 2017 is lower, for instance, than that in 2009, a fact also recently analyzed by Franco¹⁵.

In 2018, when the changes in the financing blocks and the transfers by the National Health Funding became effective, as of Ordinance 3.992, of 12/28/2017¹⁶, there was a large reduction in transfers related to financing and increase in those related to investment. This Ordinance cancels the previous ones, joins the previous blocks into a single one and establishes two financing blocks: (i) Block of Financing for Actions and Services and (ii) Block of Investments in the Public Health Services Network (Brazil, 2018). The change in the percentage of transfer between financing and capital is due to the change in the financing blocks and allocation of previous blocks

Table 1. Number of Oral Health Teams (OHTs), OHT population coverage (%), number of implemented Dental Specialties Center, total transfer adjusted/not adjusted by IPCA and % of spending on primary (PC) and specialized care (SC) and investment between 2003 and 2018.

| Year | OHT* | OHT population coverage (%)** | DSC | Total transfer Costing + Capital Values adjusted by IPCA | % Costing | % Capital | % PC | % SC |
|------|--------|-------------------------------|-------|--|-----------|-----------|--------|--------|
| 2003 | 6,170 | 20.5 | - | R\$ 191,549,053.10 | 100.00% | 0 | 97.73% | 2.27% |
| 2004 | 8,951 | 26.6 | 100 | R\$ 434,927,702.00 | 98.47% | 1.53% | 95.33% | 3.14% |
| 2005 | 12,603 | 34.7 | 336 | R\$ 646,016,493.06 | 94.89% | 5.11% | 87.62% | 7.27% |
| 2006 | 15,086 | 39.8 | 498 | R\$ 834,576,989.52 | 96.94% | 3.06% | 85.43% | 11.51% |
| 2007 | 15,694 | 29.9 | 604 | R\$ 944,121,804.17 | 99.10% | 0.90% | 85.90% | 13.20% |
| 2008 | 17,807 | 33.3 | 674 | R\$ 966,406,637.19 | 99.14% | 0.86% | 86.22% | 12.92% |
| 2009 | 18,982 | 34.6 | 808 | R\$ 1,012,871,323.99 | 99.30% | 0.70% | 85.05% | 14.25% |
| 2010 | 20,424 | 36.5 | 853 | R\$ 1,082,757,666.35 | 99.96% | 0.04% | 87.94% | 12.02% |
| 2011 | 21,425 | 38.4 | 882 | R\$ 1,138,369,021.46 | 99.03% | 0.97% | 85.43% | 13.59% |
| 2012 | 22,203 | 38.9 | 944 | R\$ 1,290,637,679.59 | 99.39% | 0.61% | 86.01% | 13.38% |
| 2013 | 23,150 | 39.4 | 988 | R\$ 1,121,273,493.23 | 99.05% | 0.95% | 81.44% | 17.61% |
| 2014 | 24,323 | 39.8 | 1.030 | R\$ 1,158,100,496.56 | 99.65% | 0.35% | 78.79% | 20.86% |
| 2015 | 24,467 | 40.3 | 1.034 | R\$ 1,143,631,782.32 | 99.84% | 0.16% | 80.35% | 19.49% |
| 2016 | 24,384 | 39.9 | 1.072 | R\$ 1,169,899,916.68 | 99.77% | 0.23% | 80.51% | 19.26% |
| 2017 | 25,905 | 41.2 | 1.115 | R\$ 1,102,424,000.46 | 99.73% | 0.27% | 78.33% | 21.40% |
| 2018 | 26,807 | 42.2 | 1.139 | R\$ 541,746,947.93 | 72.16% | 27.84% | 72.16% | *** |

*Mod I + Mod II. Data related to December 2003 to 2017 and November/2018. **From 2003 to 2006 – SAGE/MS. From 2007 to 2018 DAB e-manager. ***Values not available in FNS. All values for 2018 are allocated to primary care or investments.

Source: The authors, based on data from the MoH and IBGE.

into a single one. The reduction in transfers in 2018 is a drastic one regarding the global amount and quite significant for the financing of services.

In Primary Care, the transfers represented a higher transfer percentage, having increased until 2012, and then showing a reduction, followed by maintenance and subsequent decrease in 2018. An increase in the number of Oral Health Teams can be observed in modalities I and II, with a deceleration as of 2013. Moreover, as a first effect of the economic crisis, the municipalities, which traditionally constitute the main providers for the financing of oral health services¹⁷, have not implemented new teams in primary care due to their committed revenues, limited by laws such as the Fiscal Responsibility Law and the reduction of transfers from other sources, such as the Municipal Participation Fund^{18,19}.

When analyzing the indicator of population coverage of oral health services in primary care, two reductions in the historical growth trend are identified: one in 2007 and one in 2016. The first is explained by the change in the calculation of this indicator, because the National Oral Health Coordination of the MoH dissociated from the unspecific calculation of one Family Health Team for 4,500 inhabitants and started to customize for oral health, with a team for 3,450 inhabitants. The second and more recent reduction is a likely product of the austerity generated for economic adjustments, but that will be most strongly reflected in the indicators of the utilization of these services.

In Specialized Care, the transfers increased until 2017; however, due to changes in the transfer blocks, the values related to the transfers to the Dental Specialization Centers and Regional Dental Prosthesis Laboratories were not discriminated at the Transparency Portal of the National Health Funding. A study indicated that a larger portion of the funds was destined to the Municipal Dental Specialties Centers¹⁴.

As for the investments, these represented a small portion of the resources in the entire studied historical series, except for 2018, where a considerable increase can be observed. However, we emphasize that this change may represent a modification and adjustment in the financing blocks as of 2018 and not necessarily an increase in investment resources.

The analyzed historical series shows the evolution of the number of Dental Specialty Centers (DSCs) in the national territory, although it decreased as of 2014, similar to the study by Rossi et al.¹⁴. It is noteworthy that there was only an

adjustment in the amount transferred by the federal Government to the states and municipalities for the implementation and monthly support of these services, implemented by Ordinance No. 600 of 03/23/2006²⁰, readjusted by Ordinance No. 1,341 of 07/13/2012²¹, which also established incentives for the care network for people with disabilities and revoked the previous ordinance.

The global transfer of resources showed an upward trend from 2003 to 2010, during the two terms of former President Luiz Inácio Lula da Silva (Labor Party) and remained stationary in the subsequent term of former Presidents Dilma Rousseff (Labor Party) and Michel Temer (Brazilian Democratic Movement Party) (Table 1). The use of primary care services, analyzed here through the coverage indicators of the first programmatic dental appointment and the collective action of supervised tooth brushing show significant reductions as of 2014 and especially between 2017 and 2018. The first appointment coverage increased from 2003 to 2010 and decreased from 2011 to 2018 (Table 2). This means that a much smaller portion of the population has access to individual dental care in Primary Care under the Unified Health System (SUS)²². Chaves et al.¹³ disclosed the same decrease in outpatient production of the first programmatic dental appointment and supervised brushing procedures from 2008 to 2017. The study shows that in 2017, the largest decrease in coverage occurred in the Midwest, South and Northeast regions¹³.

Harmful impacts tend to be observed in the national survey of oral health status of the Brazilian population scheduled for the year 2020. This is due to the fact that financing cuts and restrictions to public service access affect mostly the poor, who are solely dependent on SUS¹⁹.

The total number of specialized procedures submitted to the analysis fluctuates over the years, with an increase between 2009 and 2012, 2014 to 2017 (Table 3), with an increasing trend, but with a sharp decrease in 2018. A tendency towards a reduction in the number of specialized procedures in oral health can be observed, specifically those related to endodontics, from 2011 to 2018 (Table 4), as a consequence of the difficulty of having access to a dental surgeon in primary care (as an indicator of first dental appointment coverage) and his referral to specialized care.

As for the specialized periodontal surgical procedures, there is a reduction in gingival grafts from 2012 onwards, a reduction of gingivoplasty/gingivectomy procedures and other periodontal surgical treatments as of 2017 (Table 3). How-

Table 2. Number of Oral Health Teams (OHTs), OHT population coverage (%), first dental appointment coverage (%), supervised dental brushing collective action coverage in Brazil between 2003-2018, and coverage rate of exclusively dental plans per year, based on the ANS Outpatient Information System and data.

| Year | Oral Health Teams ^a | OHT population Coverage (%) [*] | Absolute N. of first dental appointment | First dental appointment coverage (%) | Absolute N. of supervised dental brushing collective action | Supervised dental brushing collective action | Health Insurance Coverage rate ^{**} |
|------|--------------------------------|--|---|---------------------------------------|---|--|--|
| 2003 | 6,170 | 20.5 | 20,541,286 | 11.8 | * | - | 2.30 |
| 2004 | 8,951 | 26.6 | 19,880,236 | 11.2 | * | - | 2.90 |
| 2005 | 12,603 | 34.7 | 21,259,668 | 12.0 | * | - | 3.30 |
| 2006 | 15,086 | 39.8 | 21,616,728 | 11.6 | 39,441,678 | 1.8 | 3.80 |
| 2007 | 15,694 | 29.9 | 21,905,348 | 11.6 | 52,897,566 | 2.3 | 4.60 |
| 2008 | 17,807 | 33.3 | 26,843,628 | 14.0 | 57,693,648 | 2.5 | 5.70 |
| 2009 | 18,982 | 34.6 | 27,156,753 | 14.0 | 60,304,340 | 2.6 | 6.70 |
| 2010 | 20,424 | 36.5 | 26,043,708 | 13.3 | 63,527,864 | 2.8 | 7.40 |
| 2011 | 21,425 | 38.4 | 29,449,468 | 14.9 | 62,504,333 | 2.7 | 8.00 |
| 2012 | 22,203 | 38.9 | 26,395,480 | 13.2 | 54,380,251 | 2.3 | 5.00 |
| 2013 | 23,150 | 39.4 | 29,526,595 | 14.7 | 53,246,037 | 2.2 | 9.90 |
| 2014 | 24,323 | 39.8 | 27,093,617 | 13.4 | 57,151,878 | 2.3 | 10.30 |
| 2015 | 24,467 | 40.3 | 29,925,575 | 14.6 | 50,543,350 | 2.1 | 10.80 |
| 2016 | 24,384 | 39.9 | 21,661,874 | 10.5 | 37,078,584 | 1.5 | 11.00 |
| 2017 | 25,905 | 41.2 | 17,263,772 | 8.3 | 29,556,598 | 1.2 | 11.60 |
| 2018 | 26,807 | 42.2 | 7,873,770 | 3.8 | 14,320,962 | 0.7 | 12.40 |

^{*}Mod I + Mod II. Data for December of each year. – Change of indicator for the period 2003-2007. ^{**}Data provided by ANS. Source: The authors, based on data from the MoH and IBGE. Adapted from Chaves et al., 2018¹³.

Table 3. Number of implemented DSCs, number of endodontic treatments and specialized periodontal procedures performed between 2008 and 2017 from the Outpatient Information System, SIA-SUS. Brazil.

| Year | Number of DSCs | Number of Endodontic Treatments | Number of Periodontal Procedures(per sextant - SIA/SUS codes: 0414020081, 0414020154, 0414020162, 0414020375) | | | |
|------|----------------|---------------------------------|---|--------------------------------|--------------------------------|---------|
| | | | Gingival graft | Gingivectomy and Gingivoplasty | Periodontal Surgical Treatment | Total |
| 2008 | 674 | 527,474 | 22,646 | 287,918 | 92,766 | 403,330 |
| 2009 | 808 | 612,621 | 12,484 | 194,802 | 82,684 | 289,970 |
| 2010 | 853 | 681,057 | 7,054 | 191,439 | 88,871 | 287,364 |
| 2011 | 882 | 684,800 | 7,365 | 191,642 | 95,901 | 294,908 |
| 2012 | 944 | 691,933 | 10,859 | 193,156 | 105,807 | 309,822 |
| 2013 | 988 | 687,296 | 8,956 | 177,605 | 99,196 | 285,757 |
| 2014 | 1,030 | 683,265 | 5,155 | 177,518 | 147,064 | 329,737 |
| 2015 | 1034 | 682,181 | 5,230 | 203,788 | 168,631 | 377,649 |
| 2016 | 1072 | 635,923 | 3,877 | 189,740 | 180,837 | 374,454 |
| 2017 | 1,115 | 582,040 | 4,405 | 251,335 | 190,528 | 446,268 |
| 2018 | 1,139 | 495,005 | 4,139 | 133,747 | 159,427 | 297,313 |

Source: The authors, based on data from MS/SIA/SUS, 2018. Adapted from Chaves et al., 2018¹³.

ever, in the global analysis of periodontal procedures, the trend was increasing in two analyzed

periods (Table 4). The specialized periodontal procedures are not performed in Family Health

Table 4. Trend analysis of indicators on oral health financing, use of public services and access to exclusively dental plans in Brazil, 2003-2010 and 2011-2020.

| Indicators | 2003 | 2010 | APC | 95%CI | P | T | 2011 | 2018 | APC | 95%CI | P | T |
|--|-------------|---------------|-------|----------------|-------|---|---------------|-------------|--------|-----------------|-------|---|
| Total transfer (R\$) | 191,549,053 | 1,082,757,666 | 25.85 | [7.69; 47.07] | 0.000 | I | 1,138,369,021 | 541,746,948 | -5.81 | [-11.82; 0.61] | 0.068 | S |
| Total per capita transfer (R\$) | 1.10 | 5.65 | 24.04 | [6.51; 44.47] | 0.013 | I | 5.97 | 2.63 | -6.26 | [-12.50; 0.42] | 0.061 | S |
| Absolute N. of first dental appointments | 20,541,286 | 26,043,708 | 4.91 | [2.77; 7.11] | 0.001 | I | 29,449,468 | 7,873,770 | -15.42 | [-27.94; -0.74] | 0.043 | D |
| Coverage first dental appointments (%) | 11.76 | 13.59 | 3.41 | [1.05; 5.82] | 0.012 | I | 15.44 | 3.82 | -16.10 | [-28.97; -0.91] | 0.042 | D |
| Number of Endodontic Treatments | 342,142 | 681,057 | 10.85 | [9.32; 12.41] | 0.000 | I | 684,800 | 495,005 | -4.36 | [-8.09; -0.48] | 0.033 | D |
| Total Periodontal Procedures | 138,163 | 287,364 | 14.60 | [6.01; 23.89] | 0.005 | I | 294,908 | 297,313 | 5.27 | [2.33; 8.29] | 0.007 | I |
| Health Plan Coverage Rate (%) | 2.30 | 7.40 | 18.45 | [17.17; 19.75] | 0.000 | I | 8.00 | 12.40 | 10.34 | [4.44; 16.57] | 0.005 | I |

Caption: T = trend, I = Increasing, D = decreasing and S = stationary.
Source: Own elaboration.

Units but are performed by specialized professionals in DSCs. The descriptively observed reduction has not yet changed the presentation of its trend as of the austerity measures implemented in a recent period from 2014 to 2016, although the growth from 2011 to 2018 is lower than the increase observed in the previous period.

A survey carried out in the pre- and post-economic crisis periods in Spain also showed there was a direct impact on the access to specialized health services accompanied by increased demand for medical emergencies²³.

Thus, fiscal rules seem to be useful in curbing the level of health care expenditure, but with the noteworthy consequence of triggering deleterious effects on service provision²⁴, such as in Greece between 2009 and 2012, when there were cuts in health expenses for hospitalizations, medications and outpatient care²⁵.

In European countries, exposure to loans from international financial institutions and the decrease in tax revenues showed more correlation with decisions to implement health expenditure cuts than the recommendations of the political parties²⁶.

If, on the one hand, there was a reduction in the role of the Government in the provision of oral health services, on the other hand, there was a strengthening of the private market, especially of exclusively dental health plans. This is one of the cornerstones of the proposed model of economic adjustment for public health proposed in Brazil: there are privatist interests within SUS regarding the effects of such measures²⁷.

The coverage of exclusively dental plans increased significantly between 2000 and 2018 (Table 2). In December 2008, there were 11,061,362 insured individuals, which increased to 24,310,288 in September 2018. That is, the number of Brazilians who now have access to these plans increased significantly; however, these users are often not sure about their plan's contractual coverage and limits²⁸, leading to a false perception that these plans may provide coverage for all their dental treatment needs.

Between 2008-2009 only 2.5% of Brazilian households had exclusively dental health plans, with the beneficiaries showing a profile of higher income and higher level of schooling, according to data from the IBGE Family Budget Survey²⁹. The latest data from this survey have not been published yet. The households with higher level of schooling and income were associated with higher spending. São Paulo was the state with the highest expenditure and those in the Northern

Region, such as Amazonas and Tocantins, were those with the lowest.

More recent data indicate the increase in the number of beneficiaries in this modality of private access to oral health services, as opposed to what happens in medical insurance plans³⁰, as they have accumulated a decrease in the number of beneficiaries since 2016³¹, a phenomenon also experienced in Ireland after the austerity measures implemented for public health in recent years³².

In opposition to the background of the public financial crisis, dental plan companies have shown increasing revenues over the analyzed period. Except for 2018, as data were only available until August. Therefore, it cannot be compared to the others. However, their expenses have been maintained since 2011, with a reduction in 2017. Therefore, their profit almost doubled between 2016 and 2017 (Table 5).

Considering the context of the economic crisis and austerity measures after 2016, the Brazilian Ministry of Health established a Working Group to discuss the proposal of Affordable Health Plans. Among the arguments for this measure, the following stand out: the increase in the number of unemployed individuals in the

country and the effects on the supplementary health market and the need to increase the insured mass to make the cost viable for the health care plan operators³³.

Considering the decreasing Brazilian household income caused by the economic crisis, measures such as those that foresee the creation of supplementary health modalities compatible with this new profile can generate catastrophic costs (over 40%) in the family budget. They will also lead to a reduction in the public budget for health care and aggravate the permanent underfunding of SUS³¹. Studies on the specificity of the dental field should reveal how it functions and how the risk absorption occurs among the operators. There are signs that the risk is assumed by the providers through the precarization of work and low remuneration of the procedures or by not authorizing them.

A shortcoming of the present study regarding the analysis of two major periods is highlighted due to the impossibility of using the trend analysis for short observation periods. Thus, there is a need for the systematic monitoring of policies and other study possibilities based on the unanswered questions.

Table 5. Revenues, expenses and profit of exclusively dental plan companies in Brazil between 2003 and 2018, adjusted by the IPCA.

| Year | Revenues (A) Absolute values | Revenues (A) Values adjusted by IPCA | Expenses (B) Absolute values | Expenses (B) Values adjusted by IPCA | A-B Absolute values | A-B Values adjusted by IPCA |
|------|---------------------------------|--|---------------------------------|--|---------------------------|--------------------------------------|
| 2003 | 503,565,856.00 | 1,156,335,153.02 | 439,530,358.00 | 1,009,290,835.99 | 64,035,498.00 | 147,044,317.03 |
| 2004 | 598,981,305.00 | 1,282,603,220.65 | 497,748,152.00 | 1,065,831,900.76 | 101,233,153.00 | 216,771,319.89 |
| 2005 | 743,312,579.00 | 1,498,509,239.51 | 612,333,399.00 | 1,234,456,784.38 | 130,979,180.00 | 264,052,455.13 |
| 2006 | 910,346,220.00 | 1,781,471,629.67 | 742,074,189.00 | 1,452,177,298.89 | 168,272,031.00 | 329,294,330.78 |
| 2007 | 1,182,472,532.00 | 2,220,990,976.20 | 1,035,921,316.00 | 1,945,729,674.58 | 146,551,216.00 | 275,261,301.62 |
| 2008 | 1,272,309,260.00 | 2,246,235,788.96 | 1,126,812,499.00 | 1,989,364,254.65 | 145,496,761.00 | 256,871,534.31 |
| 2009 | 1,466,057,564.00 | 2,483,527,022.82 | 1,282,317,877.00 | 2,172,268,795.97 | 183,739,687.00 | 311,258,226.85 |
| 2010 | 1,805,512,742.00 | 2,895,401,661.70 | 1,579,923,053.00 | 2,533,635,862.32 | 225,589,689.00 | 361,765,799.38 |
| 2011 | 2,205,891,786.00 | 3,317,177,935.25 | 1,873,585,718.00 | 2,817,462,417.24 | 332,306,068.00 | 499,715,518.01 |
| 2012 | 2,454,271,223.00 | 3,497,152,422.43 | 2,088,620,779.00 | 2,976,127,963.52 | 365,650,444.00 | 521,024,458.91 |
| 2013 | 2,621,555,789.00 | 3,531,592,441.53 | 2,229,284,596.00 | 3,003,149,756.45 | 392,271,193.00 | 528,442,685.08 |
| 2014 | 2,874,714,484.00 | 3,634,381,934.00 | 2,465,543,769.00 | 3,117,084,420.53 | 409,170,715.00 | 517,297,513.47 |
| 2015 | 3,100,799,771.00 | 3,548,468,435.54 | 2,674,800,065.00 | 3,091,881,906.62 | 425,999,706.00 | 456,586,528.92 |
| 2016 | 3,210,551,952.00 | 3,434,108,784.47 | 2,825,008,074.00 | 3,021,718,753.71 | 385,543,878.00 | 412,390,030.76 |
| 2017 | 3,440,473,646.00 | 3,579,671,425.20 | 2,649,228,785.00 | 2,756,413,667.49 | 791,244,861.00 | 823,257,757.71 |
| 2018 | 1,626,332,953.00 | 1,626,332,953.00 | 1,386,264,999.00 | 1,386,264,999.00 | 240,067,954.00 | 240,067,954.00 |

*Data available until August/2018. Values in Brazilian reais.
Source: ANS.

Final considerations

This study analyzed the effects of austerity and economic crisis on oral health financing. Federal financing showed a growing trend from 2003 to 2010 and remained stable from 2011 to 2018. The change in transfers can be clearly identified after the austerity measures were implemented. The provision of primary care services, analyzed here by the coverage of the first dental appointment, increased in the first period and decreased in the following seven years. As for specialized care, the same is true for endodontic treatments. That is, a much smaller portion of the population can have access to individual dental care in Primary Care under the Unified Health System (SUS). The same is true for specialized procedures, such

as the drastic reduction in endodontic treatment completion and periodontal surgical procedures.

Meanwhile, in opposition to the public financial crisis, exclusively dental plan private companies expanded the market from 2.6 million users in 2000 to 24.3 million in 2018 (approximately 11.6% of the population), with a profit of more than 240 million reais, already corrected by the IPCA. This study corroborates the interpretation that the public-private health mix is competitive and harmful to the public part of the system. Fiscal austerity has had a strong influence on the use of public dental services in Brazil, which may be benefiting the private market. In this sense, social inequality also remains in oral health, perpetuating an exclusionary model that reproduces the inequalities.

Collaborations

TRA Rossi and JE Lorena-Sobrinho performed data collection, analysis, article writing and review. SCL Chaves and PJJ Martelli analyzed the data, wrote the manuscript and revised its final version.

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