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Reduction of social inequalities in utilization of dental care in Brazil from 1998 to 2008

ABSTRACT

OBJECTIVE: To analyze access to and utilization of dental care services in Brazil.

METHODS: We used data from the 2003 and 2008 Brazilian National Household Surveys, which we compared to data from the 1998 survey. We investigated dental care access and utilization variables at ages three, six, nine, 12, 15, and 19 years in the first (Q1) and fifth (Q5) quintiles of *per capita* family income. All analyses took into account the complex sampling strategy.

RESULTS: The proportion of subjects that had never visited a dentist decreased during the period (18.7% in 1998, 15.9% in 2003 and 11.7% in 2008). There was an important reduction in the absolute difference in failure to use dental care services after age nine years between Q1 and Q5 from 1998 to 2008, which decreased to about half its value at 15 (30.3 percentage points - pp to 16.1 pp) and 19 years (20.4 pp to 9.9 pp). Q5/Q1 ratios for recent dental appointments fell across all age groups, especially between zero and six years (Q5/Q1 from 3.2 to 2.6); utilization of the Brazilian Unified Health Care System increased in Q1 and Q5, with a reduction in the Q1/Q5 ratio of approximately 20%. Use of the Brazilian Unified Health Care System increased by approximately 8% in Q1 and 35% in Q5 between 2003 and 2008.

CONCLUSIONS: There have been considerable advances in terms of reducing inequalities in access to, and increasing the utilization of, dental care services in Brazil between 1998 and 2008. However, inequality between social groups remains substantial.

DESCRIPTORS: Dental Health Services, utilization. Health Services Accessibility. Health Inequalities. Social Inequity. PNAD.

INTRODUCTION

Socioeconomic inequalities have a substantial influence on health, irrespective of a country's income level.[19] Inequality in income distribution not only affects the health of those who are poor, but also influences the living and health conditions of the society as a whole.[4] Individuals living in regions with large income inequality are worse off in terms of health than those in equivalent socioeconomic conditions but who live in regions that are more egalitarian.[15] Individuals with similar income show different prevalence of tooth loss,[16] which is higher in poorer settings and lower in richer ones.[17]

According to the World Health Organization's Commission on Social Determinants of Health[20] reducing inequities in health is an ethical imperative. In Brazil, the *Comissão Nacional dos Determinantes Sociais em Saúde* [National Commission on Social Determinants of Health], established in 2006, stimulates the production of data on the magnitude of inequalities and the role of social

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determinants of health, as a means of targeting public policies and reducing social inequalities in health.

These inequalities extend to the dental health of the Brazilian population. Socioeconomic inequality is observable in the distribution of most dental conditions, and in the access to and utilization of dental care services, at both the ecological[7] and individual[3] levels. The health supplement of the 1998 *Pesquisa Nacional por Amostra de Domicílios* (Brazilian Household Survey – PNAD 1998) showed that only about one-third of subjects had visited a dentist in the year preceding the survey, and that 18.7% of subjects had never had a dental appointment. The proportion of subjects aged 20-49 years who had never had a dental appointment was 16 times higher among the poorest 20% than among the richest 20%.[3] Data from PNAD 2003 showed a modest reduction (of roughly 3% points) in this proportion when compared to 1998.[15]

The 2008 PNAD showed evidence of improvement in the utilization of dental care by the population, although 11.7% of subjects had still never visited a dentist.[a]

In spite of the expressive reduction in dental caries among children and adolescents in Brazil between 1980[11] and 2010,[12,13] the dental conditions of adults and elderly are still poor. Only one-third of the older adults that required total dental prostheses had their needs fulfilled. Edentulism affects primarily those with monthly income below R$ 400,00 and less than seven years of schooling,[b] making it a marker of inequality. This inequality in terms of oral health becomes even more emblematic given the expressive dentist-to-population ratio in Brazil (1.11/1000), one of the highest in the world.[c]

Over 1.2 billion reais were invested in the Brazilian National Dental Health Policy between 2003 and 2006. This value increased to over 2.7 billion between 2007 and 2010. Increasing primary care through the Family Health Program, adding fluoride to water treatment and supply plants, and providing access to specialized treatment through Dental Specialty Centers are part of the strategy to reduce social inequalities in dental health.[d] In parallel to these investments, there must be an assessment of the extent to which they have led to reduction in inequalities in use and access to dental health services among different social groups. Analyzing and monitoring the health of a population and its access to and utilization of health care services is instrumental to the elaboration of public policies and to the evaluation of their effectiveness. Systematic collection of high-quality information and the creation of national databases for health-related information in Brazil have made such monitoring possible, contributing to the construction and improvement of the *Sistema Único de Saúde* (Brazilian Unified Health Care System – SUS). Notwithstanding, there are few nationwide studies evaluating time trends in economic inequality in access to and utilization of dental care services.[3]

The aim of the present study was to investigate the patterns of access to and utilization of dental care services in Brazil.

METHODS

We carried out a study using data from the 2003 and 2008 PNADs, conducted by the Brazilian Institute of Geography and Statistics [*Instituto Brasileiro de Geografia e Estatística*] (IBGE).

The health supplement of PNAD 2003 was administered to 384,834 subjects distributed across 133,255 households in the entire country. In 2008, this sample comprised 150,591 households and 391,868 subjects. Both surveys used a three-stage cluster sampling strategy. The first stage was consisted of municipalities, classified into two categories: self-representative (probability of belonging to the sample = 1) and non self-representative. Municipalities in the second category were stratified and selected with replacement and with probability proportional to their population (obtained from the 2000 Demographic Census). The second stage consisted of selection of census tracts within each municipality, with replacement and proportional probability. The number of households in the tract according to the 2000 Census was used. Individual households were selected in the last stage, with equal probability in each of the sample's census tracts.[6]

We analyzed information on seeking of health care services in the last two weeks (yes; no) and the reason for seeking health care (exam/prevention, accident/lesion, dental health problem, treatment/rehabilitation, antenatal care, delivery, vaccination, disease, medical certificates).

To investigate access to and utilization of dental care services, we used the following variables: time since last dental appointment (less than one year; one to two years; three or more years; and never had an appointment), seeking health care services in the last two weeks (yes; no), place where care was sought (private dental practice; health center; other facilities), success in

[a] Instituto Brasileiro de Geografia e Estatística. Um Panorama da Saúde no Brasil: acesso e utilização dos serviços, condições de saúde e fatores de risco e proteção à saúde 2008. Brasília; 2008 [cited 2010 Jun 24]. Available from: http://www.ibge.gov.br/home/estatistica/populacao/panorama_saude_brasil_2003_2008/defaulttabzip_2008.shtm.

[b] Ministério da Saúde (BR). Secretaria de Atenção à Saúde. Departamento de Atenção Básica. Coordenação Geral de Saúde Bucal. Projeto SB Brasil 2003. Condições de saúde bucal da população brasileira 2002-2003. Resultados Principais. Brasília; 2004.

[c] Conselho Federal de Odontologia. Brasília; 2009[cited 2009 Sep 03]. Available from: http://cfo.org

[d] Ministério da Saúde (BR). Secretaria de Atenção à Saúde. Departamento de Atenção Básica. Coordenação Geral de Saúde Bucal. Brasil Sorridente. Brasília; 2003[cited 2010 Jun 24]. Available from: http://dtr2004.saude.gov.br/dab/cnsb/brasil_sorridente.php

last attempt to obtain care (yes; no); reason for failing to obtain care (no vacancies; no doctors; no specialized services; equipment not working; could not pay; waited too long; other), type of facility where care was provided (public; private), health insurance used (yes; no), paid for service (yes; no), use of the SUS (yes; no), and perceived quality of the service (very good; good; regular; bad; very bad).

We estimated the prevalence of variables of interest for the population as a whole. We compared the proportion of subjects that had never visited a dentist at ages three, six, nine, 12, 15, and 19 years in the first (Q1) and fifth (Q5) quintiles of *per capita* family income, according to the 1998 PNAD analysis[3], to allow for comparisons to be made between the 1998, 2003, and 2008 surveys. Subjects that had never visited a dentist, those that had visited a dentist less than a year prior to the interview, those that sought dental care in the two weeks preceding the interview, and those that were unable to obtain dental care in their last attempt were analyzed according to age group (zero to six, seven to 19, 20 to 49, and 50 or more years) and income (first and fifth quintiles). The proportion of subjects covered by SUS and of subjects who paid for dental treatment or other health services out of pocket were compared between the first and fifth income quintiles by calculating the ratio between the proportions in the two groups.

Data were analyzed using the STATA 9.0 statistics package. We used the *svy* family of commands designed for analyzing complex samples. The municipality was regarded as the primary sampling unit, and individual sampling weights were obtained from the PNAD databases.

RESULTS

Approximately half of the subjects were female; the most frequent age group was 20 to 49 years, and the least frequent was zero to six years in 2003 and 2008. Recent use of dental care services (appointments in the last year) increased slightly between 2003 and 2008, and the proportion of the population that had never visited a dentist decreased by roughly 30% during the same period. Dental care was the third most frequent reason for seeking health care services in the last two weeks (preceded by appointments due to disease and general health or preventive appointments), increasing from 8.5% to 14.0% (Table 1).

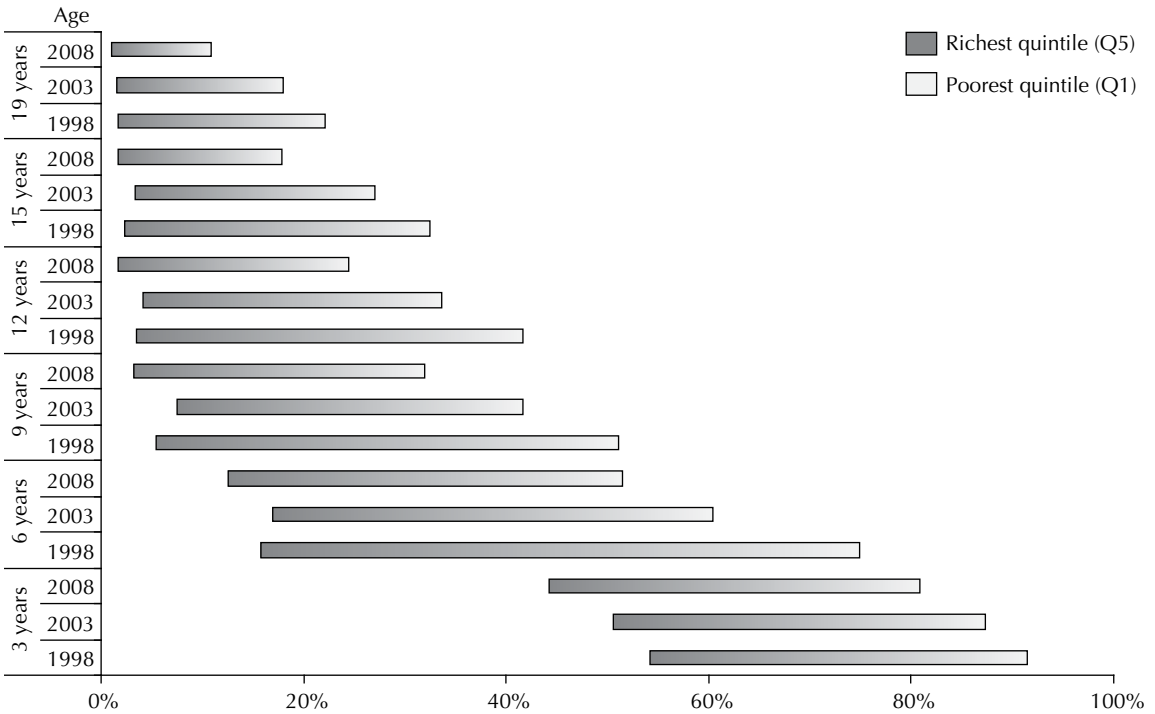
Approximately one-fifth of those who sought dental care in the preceding two weeks did so in health centers or facilities, and 96.0% of those who sought dental care were successful in their first attempt in both years. Failure to obtain dental care due to lack of vacancies decreased by approximately 20% from 2003 to 2008; lack of physicians and services or malfunctioning equipment more than doubled in the same period. Over 15% of subjects reported receiving dental care through private health insurance, and SUS accounted for 30% of appointments in both years. Most subjects rated the quality of care as good or very good (Table 1).

Dental care utilization increased across all age groups between 1998 and 2008. Expressive differences within age groups were observed between the poorest (Q1) and the richest (Q5) subjects in all three surveys. The greatest absolute difference between Q1 and Q5 was seen among six-year-olds in 1998 (59.1 percentage points – pp), 2003 (43.4 pp) and 2008 (39.0 pp). Beginning at age nine years, there was an important reduction in the absolute difference between Q1 and Q5 in all three surveys, with decreases of approximately 50% at ages 15 (30.3 pp to 16.1 pp) and 19 (20.4 pp to 9.9 pp) (Figure).

The proportion of subjects that had never visited a dentist was substantially larger among children aged up to six years when compared to other age groups in 2003 (71.5%) and 2008 (66.8%). The proportion of subjects that had never had dental care in the richest quintile (Q5) remained stable between 2003 and 2008 in all age groups. On the other hand, this proportion decreased with time among the poorest quintile (Q1), indicating a decrease in inequality between Q1 and Q5. The greatest reduction (roughly 20%) was detected in age groups seven to 19 (Q1/Q5 ratio of 14.8 in 2003 and of 11.8 in 2008) and 20 to 49 (Q1/Q5 ratio of 21.2 in 2003 and 17.0 in 2008). The greatest fraction of subjects who had recently visited a dentist was in the seven to 19 years age group, regardless of income level, in 2003 and 2008. Ratios between Q5 and Q1 decreased across all age groups from 2003 to 2008, with a greater reduction seen in the zero to six years age group. In this group, the Q5/Q1 ratio decreased from 3.2 in 2003 to 2.6 in 2008 (Table 2).

In all age groups, the proportion of subjects who sought dental care in the previous two weeks was low in both years, but was two times greater in Q5 than in Q1 in 2003. This scenario changed very little in 2008, with the exception of the 50 years or older group, in which the Q5/Q1 ratio increased from 2.3 in 2003 to 3.1 in 2008. Failure to obtain dental care approached 10% among the poorest (Q1) and was of 1% or inexistent among the rich (Q5) in 2003. There was a substantial reduction in the proportion of subjects in Q1 who failed to obtain dental care in 2008. The reduction in inequality in terms of access to dental care was of approximately 75% at 50 years or older (Q1/Q5 ratio of 33.3 in 2003 and 8.5 in 2008) (Table 2).

Roughly one-third of dental care appointments were paid for by SUS in both 2003 and 2008 (Table 3). The proportion of subjects that used SUS for dental care increased in the studied period among the poorest



Source: Brazilian Institute of Geography and Statistics, 2008.

Figure. Proportion of subjects that had never visited a dentist. Amplitude of the variation between the 20% richest (Q5) and the 20% poorest (Q1), according to age, among the Brazilian population. Brazil, 1998, 2003, and 2008.

(Q1) and richest (Q5) quintiles, although this increase was higher among the latter. The Q1/Q5 ratio fell by approximately 20% (from 16.2 in 2003 to 13.2 in 2008). The proportion of subjects that used SUS for non-dental care was similar in both surveys for the population as a whole and in the two extreme income quintiles. Reliance on SUS for general health care was four times greater in Q1 than in Q5. Out-of-pocket payment was more frequent for dental care than for non-dental care. Approximately half of the subjects paid for dental care in both years, a proportion that was almost four times higher in Q5 than in Q1. The corresponding ratio for general health care appointments was roughly six in 2003 and 4.8 in 2008 (a 20% reduction).

Dental care was rated mostly as good or very good in all PNADs. In both surveys, the richest (Q5) rated their care better than the poorest (Q1). The same was not true if only care provided through SUS care was considered (Table 4).

DISCUSSION

Dental care utilization increased and failure to obtain care decreased between 2003 and 2008 in Brazil. Even though dental care is still third among the reasons for seeking medical care, its proportion increased from 8.5% to 14.0% in the period, which, in absolute terms, is equivalent to an additional 10 million people seeking dental care. We observed a decrease in inequalities in access and utilization of dental care services among subjects with high and low income in Brazil during the period. The ratio of the proportion of subjects that had never had dental care among adolescents and young adults fell by approximately 20%, with a smaller reduction observed in the zero to six years age group.

Studies quantifying inequalities in health care by analyzing access to and utilization of dental care services are becoming increasingly common in the Brazilian[1,2,5] and international[9,18] literature. Hypotheses attempting to explain the positive changes seen in Brazil are complex, and involve socioeconomic and health care-related aspects. Average income in the population and employment rates increased during the studied period,[e] which may have contributed to increased search for dental care through the out-of-pocket/dental insurance network. On the other hand, increased supply of dental care within the public network, both in primary care (i.e., through the Family Health Strategy),[f] and secondary care (Dental

[e] Instituto Brasileiro de Geografia e Estatística. SIS 2009: em dez anos, cai de 32,4% para 22,6% o percentual de famílias vivendo com até meio salário mínimo per capita Brasília; 2009 [cited 2009 Sep 03]. Available from: http://www.ibge.gov.br/home/presidencia/noticias/noticia_visualiza.php?id_noticia=1476&id_pagina=1

[f] Ministério da Saúde (BR). Portal da Saúde. Brasília; [cited 2010 Jun 24]. Available from: http://portal.saude.gov.br/portal/saude/area.cfm?id_area=406

Table 1. Prevalence and distribution of variables related to utilization of dental care services. Brazil, 2003 (n = 383,156) and 2008 (n = 391,868).

Variable	2003		2008	
	n	%	n	%
Sex	383,156		391,868	
Male	186,780	48.8	190,580	48.7
Female	196,376	51.2	201,288	51.3
Age (years)	383,084		391,868	
0 to 6	47,491	12.1	41,141	10.3
7 to 19	96,983	25.0	92,911	23.4
20 to 49	172,802	44.9	179,086	45.4
50 or older	65,808	18.0	78,730	20.9
Last dental appointment (years)*	383,092		391,868	
Less than 1	147,859	38.7	157,027	40.2
1 to 2	73,556	19.1	96,792	24.7
3 or more	99,996	26.3	91,204	23.4
Never visited a dentist	61,681	15.9	46,845	11.7
Sought health care in last two weeks*	383,108		391,868	
No	327,836	85.4	336,078	85.5
Yes	55,272	14.6	55,790	14.5
Reason for seeking health care*	55,261		55,790	
Tests/preventive care	15,038	26.8	11,608	20.3
Accident/lesion	2,924	5.3	3,330	6.0
Dental problem	4,827	8.5	7,914	14.0
Treatment/ rehabilitation	1,275	2.3	2,240	3.7
Prenatal care	1,389	2.4	1,226	2.1
Delivery	208	0.4	180	0.3
Vaccination	1,042	1.9	1,026	1.8
Disease	28,218	51.9	27,258	50.0
Medical certificate	340	0.5	1,008	1.8
Sought dental care in last two weeks?*	383,097		391,868	
No	378,270	98.8	383,954	98.0
Yes	4,827	1.2	7,914	2.0
Place where 1st dental appointment was attempted*	4,827		7,914	
Dentist's practice	3,354	71.0	5,941	75.9
Health care facility/ center	975	19.5	1,735	21.5
Other health services	498	9.5	238	2.6
Successful in 1st attempt to obtain dental care*	4,827		7,914	
No	240	4.5	313	3.3
Yes	4,587	95.5	7,601	96.7
Reason for inability to obtain dental care*	240		313	
No vacancies	131	54.5	145	46.3
Dentist not available	37	15.4	91	29.1
Specialized professional not available	13	5.4	11	3.5
Non-functional equipment/service	14	5.8	30	9.6
Could not pay	5	2.1	1	0.3
Waited for too long and gave up	8	3.3	5	1.6
Other	32	14.0	30	9.6
Type of facility where dental care was obtained*	4,561		7,568	
Public	1,590	34.5	2,360	30.6
Private	2,971	65.5	5,198	69.4
Dental care paid by private health insurance	4,567		7,574	
No	3,746	83.7	6,106	82.7
Yes	821	16.3	1,468	17.3
Dental care paid out-of-pocket	4,567		7,574	
No	2,422	51.4	3,906	53.9
Yes	2,145	48.6	3,668	46.1
Dental care paid for by SUS*	4,567		7,574	
No	3,082	68.1	5,318	70.4
Yes	1,404	30.1	2,229	29.3
Unsure	81	1.8	27	0.3
Evaluation of dental care	4,567		7,574	
Very good	1,379	30.2	2,282	24.2
Good	2,833	62.0	4,785	62.3
Regular	293	6.4	421	10.4
Poor/very poor	62	1.4	86	3.1

To be continued

Table 1 continuation

* $p < 0.001$ (chi-square test)
SUS: National Health Care System
Source: Brazilian Institute of Geography and Statistics, 2008

Table 2. Proportion of subjects classified according to age group and in the 1st (Q1) and 5th (Q5) quintiles of per capita family income for different dental care-related outcomes. Brazil, 2003 and 2008.

Variable	2003				2008			
	Prevalence			Ratio	Prevalence			Ratio
	All	Q1	Q5		All	Q1	Q5	
Never visited a dentist (years)				Q1/Q5*				Q1/Q5*
0 to 6	71.5	83.1	49.1	1.7	66.8	77.6	47.3	1.6
7 to 19	18.4	35.5	2.4	14.8	12.8	24.7	2.1	11.8
20 to 49	4.0	10.6	0.5	21.2	2.6	6.5	0.4	17.0
≥ 50	5.0	12.4	1.0	12.4	3.1	7.8	0.7	11.1
All	15.9	34.8	3.9	8.9	11.7	26.1	3.2	8.2
Visited dentist less than one year ago (years)				Q5/Q1*				Q5/Q1*
0 to 6	23.7	13.7	44.3	3.2	25.7	16.5	43.2	2.6
7 to 19	50.3	34.9	75.1	2.2	51.3	39.4	71.7	1.8
20 to 49	42.6	26.5	62.3	2.4	44.5	31.5	60.2	1.9
≥ 50	23.1	10.7	40.7	3.8	25.4	14.0	42.2	3.0
All	38.7	25.6	57.5	2.2	40.2	30.1	55.3	1.8
Sought dental care (last two weeks) (years)				Q5/Q1*				Q5/Q1*
0 to 6	0.6	0.4	0.9	2.3	0.9	0.6	1.3	2.2
7 to 19	1.6	1.1	2.6	2.4	2.4	1.7	3.9	2.3
20 to 49	1.4	1.0	2.0	2.0	2.3	1.8	3.1	1.7
≥ 50	0.8	0.6	1.4	2.3	1.6	0.9	2.8	3.1
All	1.2	0.9	1.9	2.1	2.0	1.5	3.0	2.0
Unable to obtain dental care (years)				Q1/Q5*				Q5/Q1*
0 to 6	3.5	9.6	-	-	4.4	7.0	-	-
7 to 19	4.8	10.0	-	-	3.2	7.1	1.1	6.5
20 to 49	4.6	12.1	1.7	7.1	3.5	8.3	1.2	6.9
≥ 50	3.2	13.3	0.4	33.3	2.5	8.5	1.0	8.5
All	4.5	11.0	1.0	11.0	3.3	7.7	1.0	7.7

*p < 0.001 (chi-square test), except for the variable "unable to obtain care," category "0 to 6 years," for which p = 0.069 in 2003 and p = 0.048 in 2008.
Source: Brazilian Institute of Geography and Statistics, 2008.

Table 3. Payment out-of-pocket or by the Brazilian National Health Care System (SUS) for general health care and dental care services; comparison between 1st (Q1) and 5th (Q5) quintiles of *per capita* family income. Brazil, 2003 and 2008.

Type of care	2003				2008			
	Prevalence			Ratio	Prevalence			Ratio
	All	Q1	Q5		All	Q1	Q5	
Paid for by SUS				Q1/Q5*				Q1/Q5*
Dental	30.6	68.2	4.2	16.2	29.9	73.9	5.6	13.2
Non-dental	59.7	87.1	21.9	4.0	61.1	90.2	23.3	3.9
All	57.2	85.8	20.0	4.3	56.7	88.3	20.3	4.3
Paid for out-of-pocket				Q5/Q1*				Q5/Q1*
Dental	48.2	18.1	68.1	3.8	53.5	20.6	71.7	3.5
Non-dental	11.7	3.3	20.8	6.3	13.1	4.5	22.7	5.0
All	14.8	4.3	25.8	6.0	18.7	6.5	31.1	4.8

*p < 0.001 (chi-square test)
SUS: National Health Care System
Source: Brazilian Institute of Geography and Statistics, 2008.

Table 4. Rating of dental care as "good or very good," according to mode of payment, for the 1st (Q1) and 5th (Q5) quintiles of *per capita* family income. Brazil, 2003 and 2008.

Mode of payment for care[a]	Year	Prevalence			p
		All	Q1	Q5	
Out-of-pocket	2003	96.0 (n = 2,072)	95.3 (n = 103)	96.9 (n = 920)	0.403
	2008	96.4 (n = 3,771)	92.6 (n = 244)	98.1 (n = 1,512)	< 0.001
SUS	2003	86.7 (n = 1,243)	85.3 (n = 347)	85.7 (n = 52)	0.366
	2008	87.3 (n = 1,986)	86.9 (n = 621)	87.6 (n = 106)	0.543
All	2003	92.6 (n = 4,268)	88.0 (n = 528)	96.1 (n = 1,371)	< 0.001
	2008	93.6 (n = 7,131)	89.1 (n = 957)	97.2 (n = 2,194)	< 0.001

[a] The categories are not mutually exclusive or complementary.
SUS: National Health Care System
Source: Brazilian Institute of Geography and Statistics, 2008.

Specialty Centers),[f] may have contributed towards the increase in the number of patients seen. The increased number of appointments also in the out-of-pocket and private health insurance networks support the hypothesis that increased income may have led to an greater search for dental care. Increased income may have had a greater impact than the expansion of the public network in terms of health care utilization.

In spite of this reduction, inequality in dental care in Brazil is still large compared to the standards of developed countries. The same appears to be true in Hong Kong, where family income has a direct effect on dental care utilization.[9] The proportion of subjects who had never visited a dentist in each income stratum is more unequal among younger age groups. This is concerning because the major dental diseases, such as caries, begin early in life, affecting the deciduous dentition. Socioeconomic inequality in access to and utilization of dental care have been documented in other Brazilian surveys. One study analyzed data from the System for Surveillance of Risk and Protective Factors for Chronic Diseases by Telephone Survey [*Sistema de Vigilância de Fatores de Risco e Proteção para Doenças Crônicas por Inquérito Telefônico* (Vigitel)] 2009 survey, and found that individual characteristics (low schooling) and regional differences (low economic development index) were associated with less access to dental care services.[14] Social inequality in recent use of dental care were observed in the adult and elderly population covered by ESF in a municipality of Southern Brazil. Low schooling and not owning a home were found to be the most important risk factors for this outcome.[2] Inequalities in utilization of free dental care services by children in England are notoriously associated with schooling and ethnicity.[10] The same was found to be true for the elderly population of that country, especially with regard to lower regular use of dental services among those living in impoverished neighborhoods.[8]

In the present study, recent use of dental care services was greater among school children (seven to 19 years), regardless of income class, as was the equality between the extreme income quintiles. Although supply of health care services by SUS has increased, it is still likely to be greater among the younger population, reproducing the historical model of organization of public dental care services in Brazil, which has always prioritized the school-age population.[12] Dental care through SUS increased between 2003 and 2008 in the two income segments analyzed (Q1 and Q5), but remained lower than the levels reached by general health care. The slight increase in utilization of dental care through SUS among the richest quintile may reflect increased supply, improved quality of services, and the access to specialized treatment now available through the public network. This hypothesis is supported by the high rate of approval of the dental care service provided through SUS, which did not vary with income. On the other hand, coverage of dental care by SUS is low compared to its coverage of medical care, and varies greatly between the country's regions (higher in the poorest areas).[14] The most recent national survey of dental health (*Pesquisa SBBrasil 2010*) indicates that the North region has greater proportion of subjects that never had dental appointments, mean interval since the last appointment, and proportion of appointments in response to pain than the South and Southeast.[g] Analyzing utilization of dental care services is essential to evaluate the effective reach of universal health care access, the guiding principle of SUS. Inclusion of dental health in surveys such as PNAD legitimates dental health as an unalienable component of general health. Surveys such as PNAD have the advantage of investigating large samples, which produces highly precise estimates at the national level. On the other hand, studies based on secondary data may have limitations, such as the restriction of analysis to the available information, which is formulated by researchers other

[g] Ministério da Saúde (BR). Secretaria de Atenção à Saúde. Departamento de Atenção Básica. Coordenação Geral de Saúde Bucal. Pesquisa Nacional de Saúde Bucal SB Brasil 2010. Resultados Principais. [cited 2012 Jan 20]. Available from: http://189.28.128.100/dab/docs/geral/projeto_sb2010_relatorio_final.pdf

than the final users of the information. Our results may contribute to the evaluation of public policies aiming at reducing inequalities in health.

The results of the present study indicate a considerable advance in the reduction of inequalities in access to and utilization of dental care services in Brazil between 1998 and 2008. However, the gap between social groups is still wide, and can be regarded as ethically and politically unacceptable, since it brings to light disadvantages in access to and utilization of dental care among the poorest strata. We suggest the continuous investigation of aspects related to inequalities in the use of dental care services in Brazil as a means to denounce the persistency of social inequalities and as a subsidy to the adoption of policies aimed at its reduction.

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