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Analysis of the evolution and determinants of income-related inequalities in the Brazilian health system, 1998–2008

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ABSTRACT

Objective. *To analyze the evolution and determinants of income-related inequalities in the Brazilian health system between 1998 and 2008.*

Methods. *Data from the National Household Sampling Surveys of 1998, 2003, and 2008 were used to analyze inequalities in health and health care. Health was measured by self-reported health status, physical limitations, and chronic illness. Hospitalization and physician and dentist visits were proxies for health care utilization. Income was a proxy for socioeconomic status. Concentration indices were calculated before and after standardization for all dependent variables. Decomposition analysis was used to identify the main determinants of inequality in health care utilization.*

Results. *In all three periods analyzed, the poor reported worse health status, while the wealthy reported more chronic diseases; health care utilization was pro-rich for medical and dental services. Yet, income-related inequality in health care utilization has been declining. Private health insurance, education, and income are the major contributors to the inequalities identified.*

Conclusions. *Income-related inequality in the use of medical and dental health care is gradually declining in Brazil. The decline is associated with implementation of pro-equity policies and programs, such as the Community Health Agents Program and the Family Health Program.*

Key words Equity in access; equity in health; health systems; health policy; Brazil.

Since inception of the Brazilian Unified Health System (SUS) at the end of the 1980s, efforts have been made to ensure an inclusive public health system model based on decentralization to attain democratization and promote accountability. A number of investments and implementation plans have been introduced to decentralize management of health services to state and municipal levels, to afford local governments more power and resources, to provide better care, and to promote universal and equal access to health services (1–4).

A trend toward improving the health status of the population and providing better access to health services has been noted in the literature (5–7). Yet, health gains have not been equal for all Brazilians and the gap between health status and utilization of health services by the poor and the rich remains wide. Results from a study conducted in 2001, using a methodologic approach similar to the one proposed here, suggested that health care use is disproportionally distributed according to health needs, benefiting those who are in the highest income quintiles. In other words, given their health needs, those in the lowest income quintiles of the population use health care services less than

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expected when compared with those in the highest quintiles (8). These results indicate the existence of important socioeconomic barriers to access and utilization of heath care, which continues to be a challenge to the health system, despite its universalism (4, 6).

Monitoring the magnitude and trends of income-related inequality in health status and utilization of health services, while examining possible determinants of such inequality, is crucial to inform existing health policies intended to promote equity and to eliminate persistent and unfair health and health care differentials among population groups. Implementation of public policies to address gaps in the health system is an important path toward achieving equity goals but not an end in itself. To ensure that these goals are achieved and policies are adjusted when needed, it is necessary to monitor and evaluate results associated with these policies and health system characteristics relevant to these goals.

Improving the availability of evidence that can inform these processes and identify trends and areas of improvement will greatly contribute to effective planning and policy making. This study aims to analyze the evolution of income-related inequalities in health status and health care utilization of the population from 1998 to 2008 and their determinants, using survey data representative at a national level to measure the magnitude and examine the direction of equity.

A milestone in conceptualization of the Brazilian health system was the Eloy Chaves Law of 1923, which regulated existing retirement and pension funds and provided health services to beneficiaries and their dependents through employment benefits. The provision of health services remained mostly privately funded and fragmented through the 1930s, despite the merging of individual funds into several retirement and pension institutes. Creation of the Ministry of Health in the 1950s was not able to solve the remarkable disconnect between the national health system priorities and population health needs in the country (1, 9–11).

The national health system established during the military government was characterized by the creation, in 1966, of the National Social Security Institute, a public institution that centralized pensions and social security funds to finance private medical services for formal urban workers. During the 1970s, the payment of private health services by the government through fee for services became a significant source of corruption (9). The proposal for major changes in health policies arose, strongly suggesting reforms in the health system and implementation of universal health care.

The mid-1980s gave way to a redemocratization process in the country, but no significant changes occurred in the health system until an amendment was added to the Brazilian Constitution in 1988, which created the SUS and defined health as citizens' right and government's duty, guaranteed by social and economic policies to reduce the risk of disease and to support universal and equal access to health services that promote, protect, and recover health (1, 11).

Before implementation of the SUS, the responsibilities ascribed to the Ministry of Health were strictly related to activities that promote health and prevent disease in the population, such as vaccination campaigns and medical and hospital care for a few diseases, serving mostly the very poor and those without access to health care through the National Social Security Institute (9, 11). The disease-oriented medical care model at that time explains the near absence of preventive care in the service delivery system.

Today, the Brazilian health system consists of a public and a private health system, which are intertwined and complex. Health services are provided through the SUS and are free at the point of service; private services are provided through private providers to those with private insurance, which is usually employment based or privately financed. To complement its services, the SUS contracts health services from private providers to deliver publicly financed health services to the population.

The SUS, in principle, provides universal access to health care to the entire population, including primary, secondary, and tertiary care; dental health services; prescription drugs; and diagnostic and therapeutic services. Management and administration of the SUS is shared at the federal, state, and municipal levels, according to the decentralization processes. The SUS is supported by community participation in its organization and management and is regulated by a set of laws and operational norms established to create a funding structure and obligations for the system at the federal, state, and municipal levels based on a decentralization model and performance-based incentives (12–14).

Because of inadequate infrastructure, shortage of specialized human resources, and funding differences among the Brazilian regions that existed for decades before the SUS was implemented, the decentralization process has been unable to reduce major disparities in the supply and quality of health care provided to the population. These regional disparities continue to pose a challenge to management of the system and delivery of services (2, 15–17).

There has been a generalized increase in private insurance coverage during the past three decades (18). Approximately 76% of the population receives publicly financed health services exclusively through the SUS, which also provides public services to those covered by private insurance, especially for complex and costly procedures. About 24% of the population is covered by private insurance through an employer or self-coverage. Distribution of private insurance coverage is uneven, with 60% concentrated in the southeastern region, the richest in the country (7). Approximately 83% of Brazilian households in the highest per capita group (earning more than five times the minimum wage[4]) is covered by private health insurance, while private coverage for households in the lowest income group (earning one-quarter of the minimum wage) is only 2.3% (19).

MATERIALS AND METHODS

Using the methods described in the preceding article in this issue, this study analyzes data from the National Household Sample Survey (PNAD) conducted by the Brazilian Institute for Geography and Statistics. PNAD consists of household and individual-level surveys carried out annually by the Brazilian Institute for Geography and Statistics since the 1960s. Every five years, beginning in 1998, the population survey has been accompanied by a thematic module designed to collect information on the health conditions of the population. This study examined de-

[4] The minimum wage was created by the 1934 Brazilian Constitution to protect workers against excessively low wages. In 1988, the new Constitution redefined the minimum wage to provide for the essential needs of a family, including housing, food, education, health, leisure, clothing, hygiene, transportation, and social security, and calling for its periodic adjustment to preserve purchasing power.

mographic, socioeconomic, health status, and health care utilization data from the 1998, 2003, and 2008 surveys, which included a health module.

The household samples surveyed are nationally representative. The PNAD sample is based on population projections from the Brazilian Demographic Census and may be extended to represent the population by using expansion factors. These samples were collected in a three-stage probabilistic sampling process: municipalities, census sectors, and household samples. For each year of the PNAD data collection, the sample varies according to the expansion factors applied (strata, sample weight, and cluster) and the legal definition of urban and rural settings, both of which are based on the previous demographic census (20).

With regard to the health module, changes in data collection related to chronic diseases from 1998 and the following surveys were introduced. In 1998, the survey requested information on chronic diseases reported by individuals, including or not including those conditions diagnosed by a health professional. For the 2003 and 2008 surveys, the question was changed to include only chronic conditions reported by individuals as those diagnosed by a health professional. This change in the survey question for chronic diseases compromised the comparability of this variable between 1998 and the following years, since the patterns of response from the poorest and richest quintiles have also changed, probably because of differential access to health care services in these groups. Therefore, chronic disease is analyzed in the study but is not included as a health care need variable for measuring inequity in health care utilization.

The 1998 PNAD database includes information from 344 975 individuals in 90 913 households, while the 2003 and 2008 PNAD databases include information from 384 834 and 391 868 individuals in 107 846 and 118 138 households, respectively (20). As described in Table 1, variables selected from all three databases for the analysis of equity include age, sex, race, educational attainment, activity status, household income, number of household residents, family type, area and region of residence, health insurance coverage, self-assessed health status, physical limitations, chronic diseases, probability and number of physician visits, probability of dentist visits, probability of hospitalization, and number of inpatient days.

TABLE 1. Description of variables for analysis of health equity, National Household Sample Survey, Brazil, 1998, 2003, and 2008

Variable	Description
Health status	
Self-assessed health	Categorical: in general, how do you rate your own health status: 1, very good; 2, good; 3, fair; 4, poor; or 5, very poor.
Physical limitation	Categorical: do you usually have difficulty, due to a health problem, in: 1, eating, taking a shower/bath, using the bathroom; 2, running, lifting heavy objects, practicing sports, or working in a strenuous task; 3, pushing a table or fixing things around the house; 4, walking uphill or climbing stairs; 5, bending, squatting, or kneeling; 6, walking more than 1 kilometer; or 7, walking 100 meters. For each question, possible answers include: 1, cannot perform the task; 2, severe limitation; 3, some limitation; and 4, no limitation.
Chronic illness	Categorical: do you have any of the following chronic physical or mental health problems? 1, back pain; 2, arthritis or rheumatism; 3, cancer; 4, diabetes; 5, bronchitis or asthma; 6, hypertension; 7, heart disease; 8, chronic renal disease; 9, depression; 10, tuberculosis; 11, tendinitis; or 12, cirrhosis. Yes or no.
Health care utilization	
Physician visits	Categorical: did you have any physician consultation during the past 12 months? Yes or no. Numeric count: how many times have you consulted a physician during the past 12 months?
Dentist visits	Categorical: when did you last consult with a dentist? 1, within the past year; 2, 1 to 2 years ago; 3, 3 years or longer; or 4, never.
Hospitalization	Categorical: did you have any hospitalization during the past 12 months? Yes or no. Numeric count: during the past 12 months, how long were you interned in your last hospitalization?
Standard of living	
Income	Continuous: household income per month per adult equivalent.
Race/ethnicity	Categorical: self-defined race/ethnicity: 1, white; 2, black; 3, mixed; 4, oriental; or 5, indigenous.
Education	Categorical: highest level of education attained? 1, none; 2, primary; 3, secondary; or 4, post-secondary.
Education years	Numeric count: how many years of education have you had?
Geographic region	Categorical: geographic area of residence: 1, North; 2, Northeast; 3, South; 4, Southeast; or 5, Midwest.
Area of residence	Categorical: area of residence: 1, urban; or 2, rural.
Family type	Categorical: type of family: 1, couple without children; 2, couple with children; 3, single-parent home; or 4, other family type.
Economic activity	Categorical: 1, employed; 2, unemployed; 3, self-employed; 4, housework; 5, retired; 6, student; or 7, other.
Private health insurance	Categorical: yes or no.
Household size	Numeric count: number of household residents.

Household data were merged into the individual database for each period analyzed, and key matching variables were used. All variables with missing values expressed numerically were recoded into missing data. Household income was converted into household income per capita in adult equivalents, as explained in the introductory methodologic article in this issue. In order to avoid problems with analysis and to improve comparability among countries, which collect data on different age groups, only data from those 18 years of age or older were used.

RESULTS

For each health status and health services utilization variable studied, the quintile distribution, concentration curve, and concentration index are presented. Analysis of the PNAD databases and variables in Table 2 confirms demographic trends described in the literature that the population is getting older, is better educated, and is enjoying higher rates of employment (21).

In terms of health status, as noted in Table 3, individuals from lower income quintiles in general reported worse health status and severe physical difficulties more frequently than higher in-

TABLE 2. Descriptive statistics from National Household Sample Survey, Brazil, 1998, 2003, and 2008

Variable	1998		2003		2008	
	No.	%	No.	%	No.	%
Age (years)						
18–34	95 168	45.6	110 185	44.8	108 687	41.7
35–44	44 668	21.4	51 477	20.9	53 719	20.6
45–64	49 746	23.8	61 146	24.8	70 875	27.2
65–74	12 368	5.9	14 818	6.0	16 875	6.5
> 75	6 628	3.2	8 493	3.4	10 293	4.0
Sex						
Male	99 399	47.6	117 174	47.6	123 864	47.6
Female	109 210	52.4	129 012	52.4	136 585	52.4
Health status						
Very poor	1 955	0.9	1 989	0.8	2 578	10
Poor	9 194	4.4	9 684	3.9	10 623	4.1
Fair	48 706	23.4	57 670	23.4	62 482	24.0
Good	104 101	49.9	128 700	52.3	137 618	52.8
Very good	44 598	21.4	48 118	19.5	47 148	18.1
Physical limitations						
None	144 572	69.3	174 777	71.0	179 180	68.8
Moderate	51 858	24.9	57 480	23.3	63 349	24.3
Severe	12 179	5.8	13 929	5.7	17 920	6.9
Chronic disease						
None	115 878	55.5	148 295	60.2	156 612	60.1
Any	92 731	44.5	97 891	39.8	103 837	39.9
Race						
White	110 927	53.2	121 847	49.5	119 728	46.0
Black	13 280	6.4	16 830	6.8	21 171	8.1
Oriental	950	0.5	1 007	0.4	1 365	0.5
Mixed	82 981	39.8	105 956	43.0	117 308	45.0
Indigenous	471	0.2	546	0.2	877	0.3
Education						
No education	44 391	21.3	53 477	21.7	47 353	18.2
Primary	101 619	48.7	104 185	42.3	97 108	37.3
Secondary	20 163	9.7	25 760	10.5	31 000	11.9
High school or more	42 436	20.3	62 764	25.5	84 988	32.6
Activity status						
Employed	200 154	95.9	234 260	95.2	250 568	96.2
Unemployed	8 455	4.1	11 926	4.8	9 881	3.8
Housework	11 863	5.7	14 667	6.0	14 878	5.7
Self-employed	29 770	14.3	35 050	14.2	36 254	13.9
Other	344	0.2	380	0.2	643	0.2
Student	9 914	4.8	14 143	5.7	10 976	4.2
Retired	21 569	10.3	26 387	10.7	28 271	10.9
Private health insurance						
No	153 253	73.5	182 465	74.1	190 654	73.2
Yes	55 338	26.5	63 709	25.9	69 795	26.8
Location						
Urban	173 772	83.3	213 195	86.6	222 256	85.3
Rural	34 837	16.7	32 991	13.4	38 193	14.7
Geographic region						
North	14 558	7.0	25 173	10.2	31 251	12.0
Northeast	62 706	30.1	77 411	31.4	81 757	31.4
Midwest	22 553	10.8	26 791	10.9	28 758	11.0
South	36 619	17.6	40 612	16.5	40 065	15.4
Southeast	72 173	34.6	76 199	31.0	78 618	30.2
Family type						
Couple without child	25 059	12.0	32 397	13.2	40 411	15.5
Couple with child	133 606	64.0	149 645	60.8	149 869	57.5
Mother with child	29 957	14.4	38 427	15.6	40 628	15.6
Other	19 987	9.6	25 717	10.4	29 541	11.3
Household size	3.90		3.68		3.51	

come individuals. It is noteworthy that all the income groups reported worse health status in 2008 than in 2003. While individuals in higher income groups reported more chronic illness than individuals in lower income groups in 2008 than in 2003 (Table 3), possibly as a result of better access to health care and perception of their health status, the trend in reported chronic illness has been a decrease for higher income groups and an increase for lower income groups. In 1998, in contrast, the poor reported more chronic illness than the rich. This discrepancy is probably due to the change in the survey question, which did not require a medical diagnosis in 1998 but included this requirement in 2003 and 2008. Therefore, the change observed from 1998 and following surveys is probably influenced by the change in the survey question, since lower income individuals tend to have less access to health professionals for diagnosis. Concentration curves for health outcomes available in supplementary material clearly illustrate the change in this variable. The health outcome curves for 1998 show a pro-poor distribution (above the equality line) for all three variables: presence of physical limitations, less than good self-assessed health, and presence of at least one chronic illness. For 2003 and 2008, the distribution of chronic illness has changed for both years, and both curves are very close to the equality line. In 2008, the chronic illness curve has crossed the equality line at the poorest 40% of the population. Concentration indices for less than good self-assessed health and physical limitation, as per Table 4, are not statistically significant. Concentration indices for chronic illness are statistically significant and pro-rich for 2003 (0.0514) and 2008 (0.0482), but the difference between those years is not statistically significant.

Differences in the probability and intensity of use of physician visits, inpatient days, and probability of dentist visits among individuals from diverse socioeconomic groups decreased slowly over the period analyzed. Concentration curves for health care utilization in 1998, 2003, and 2008 illustrate this decline (see supplementary material). All utilization variables except the probability of hospitalization show a pro-rich distribution curve below the equality line. The curve for probability of hospitalization is very close to the equality line for most of the distribution and crosses the equality line for all years. From 1998 to 2008, the distance between all health care utilization curves and the equality line diminished, indicating less inequality over time. The trend observed with the concentration curves is confirmed by the standardized concentration indices (horizontal indi-

TABLE 3. Standardized quintile distributions of health and health care variables, National Household Sample Survey, Brazil, 1998, 2003, and 2008

Variable	Year	Mean	Quintile				
			Poorest	Second	Third	Fourth	Richest
Health status							
Less than good self-assessed health	1998	0.2870	0.3586	0.3640	0.2997	0.2461	0.1666
	2003	0.2817	0.3485	0.3380	0.3140	0.2458	0.1622
	2008	0.2906	0.3630	0.3410	0.3227	0.2545	0.1718
Any physical limitation	1998	0.3070	0.3467	0.3679	0.3110	0.2739	0.2354
	2003	0.2901	0.3047	0.3202	0.3170	0.2721	0.2363
	2008	0.3120	0.3263	0.3436	0.3429	0.2985	0.2489
Any chronic illness	1998	0.4445	0.4704	0.4817	0.4476	0.4216	0.4014
	2003	0.3976	0.3537	0.3965	0.4130	0.4098	0.4151
	2008	0.3987	0.3621	0.3986	0.4202	0.4086	0.4040
Health care utilization							
Any doctor visit	1998	0.5848	0.5185	0.5598	0.5685	0.6006	0.6763
	2003	0.6459	0.5742	0.6088	0.6346	0.6668	0.7452
	2008	0.6964	0.6339	0.6660	0.6911	0.7134	0.7774
Total number of doctor visits	1998	2.3928	2.0079	2.2932	2.3360	2.4912	2.8358
	2003	2.7156	2.3643	2.5415	2.6607	2.8029	3.2088
	2008	3.0332	2.7120	2.8667	3.0265	3.0919	3.4691
Any hospitalization	1998	0.0839	0.1014	0.0929	0.0794	0.0730	0.0728
	2003	0.0807	0.0926	0.0825	0.0780	0.0732	0.0770
	2008	0.0794	0.0891	0.0816	0.0776	0.0731	0.0757
Total number of inpatient days	1998	0.5409	0.6241	0.6460	0.5644	0.4551	0.4150
	2003	0.5086	0.5761	0.4933	0.5292	0.4740	0.4701
	2008	0.5557	0.5967	0.5882	0.5818	0.5093	0.5027
Any dentist visit	1998	0.3316	0.1991	0.2337	0.2947	0.3817	0.5489
	2003	0.3771	0.2518	0.2868	0.3297	0.4247	0.5927
	2008	0.3900	0.2917	0.3108	0.3464	0.4260	0.5749

ces) for 1998, 2003, and 2008 (Table 4), indicating historic changes related to a reduction in income-related inequalities in the utilization of health care services over time, specifically for probability of physician visits (0.072, 0.065, and 0.052), total number of physician visits (0.120, 0.103, and 0.087), and probability of dentist visits (0.227, 0.199, and 0.159). The horizontal indices for inpatient days and probability of hospitalization were not statistically significant for the three years studied. All other horizontal index utilization variables were statistically significant as well as their difference over time (see Table 4).

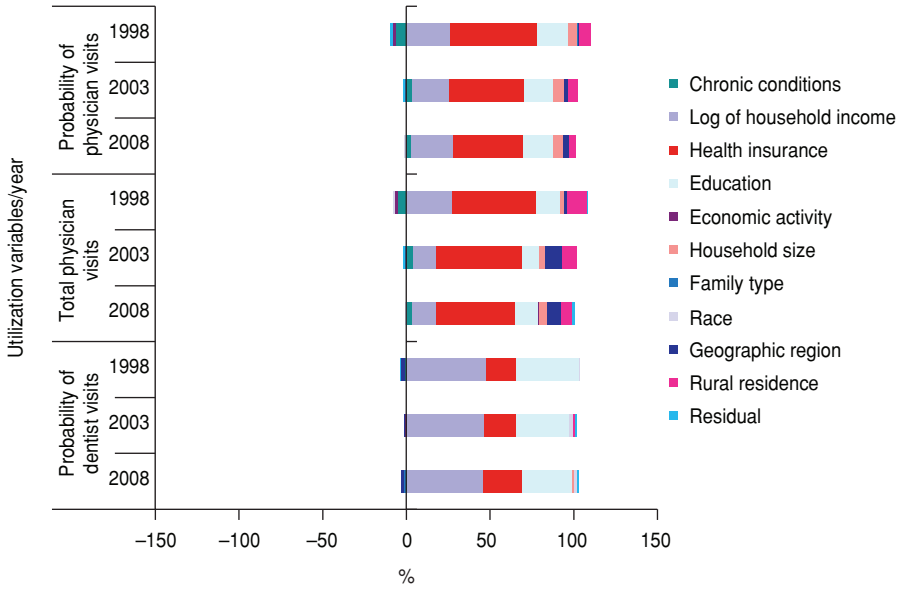
Figure 1 presents the results of decomposition analysis for all statistically significant utilization variables. Decomposition revealed the major determinants of income-related inequality (horizontal index) in health care utilization to be private health insurance, household income, and education attainment in general. Private health insurance coverage was the major determinant of inequity for probability and intensity of physician visits, followed by income and education. In the case of probability of dentist visits, major contributors were income and education, followed by private health insurance coverage. Region of the country and area of residence also contributed to inequity in utilization of health care, especially for physician visits. This situation is probably due to the infrastructure differences between regions and urban and rural areas, as hypothesized. Models testing the influence of states within each region as determinants of income-related inequality in health care utilization did not show a significant difference.

TABLE 4. Concentration indices for health status and health care utilization variables, National Household Sample Survey, Brazil, 1998, 2003, and 2008

Variable	1998		2003		2008		HI difference	
	CI	HI	CI	HI	CI	HI	1998–2003	2003–2008
Self-assessed health (less than good)	–0.1460	–0.1064	–0.1432	–0.1333	–0.1408	–0.1312	–0.0270[a]	0.0022[a]
Physical limitation (any)	–0.0880	–0.0398	–0.0591	–0.0420	–0.0571	–0.0385	–0.0022[a]	0.0035[a]
Chronic illness (any)	–0.0397	0.0028	0.0252[a]	0.0514[a]	0.0185[a]	0.0482[a]	0.0486[a]	–0.0032
Physician visits (probability)	0.0514[a]	0.0724[a]	0.0518[a]	0.0653[a]	0.0398[a]	0.0518[a]	–0.0071[a]	–0.0135[a]
Physician visits (total)	0.0656[a]	0.1200[a]	0.0581[a]	0.1030[a]	0.0429[a]	0.0868[a]	–0.0170[a]	–0.0162[a]
Hospitalization (probability)	–0.0767	–0.0104	–0.0470	0.0128	–0.0411	0.0189	0.0231[a]	0.0061
Hospitalization (days)	–0.0856	0.0239	–0.0367	0.0623	–0.0413	0.0430	0.0383[a]	–0.0192[a]
Dentist visits (probability)	0.2228[a]	0.2266[a]	0.1873[a]	0.1988[a]	0.1472[a]	0.1590[a]	–0.0278[a]	–0.0398[a]

CI: concentration index, HI: horizontal index.
[a] Significant CI and HI indices ($P < 0.05$).

FIGURE 1. Decomposition of income-related inequality (horizontal index) in health care utilization, National Household Sample Survey, Brazil, 1998, 2003, and 2008



DISCUSSION

The results of quintile distributions in Table 3 indicate that the Brazilian population reported worse health status and more physical limitations in 2008 than in 2003. Concentration indices for these variables (Table 4) are not statistically significant for all years studied, which limits the interpretation of trends in terms of equity over time for these variables. Quintile distributions of chronic illness show an increase in the first three quintiles and a decrease in the fourth and fifth quintiles from 2003 to 2008. These results are supported by pro-rich concentration indices for chronic illness for both years, although the trend between 2003 and 2008 is not clear given that the difference between these two years is not statistically significant.

A positive trend is observed in reference to equity in utilization of health services from 1998 to 2008, probably due to consolidation of the public universal health system, which seems to have reached a degree of maturity after two decades of implementation (1988–2008). The observed decline in income-related inequalities for medical and dental services may have been influenced by improved access to these services for the population, mostly the poor, through public programs such as the Community Health Agents Program and the Family Health Program. These programs have been implemented in most municipalities and seek to promote enhanced access to health care, promoting better life conditions and the use of preventive care in the population. From 1994 to 2002, the country witnessed an aggressive expansion in coverage for the Community Health Agents Program and the Family Health Program, reaching 53% and 34% of the population, respectively. Coverage in these programs continued to grow from 2002 and 2008 but at a much reduced rate, with population coverage reaching 61% and 49%, respectively. This expansion was inversely related to infant mortality rates in the country, which declined from 34 per 1 000 live births in 1994 to 16 per 1 000 in 2006 (19).

Findings reported in this study are supported by evidence from other studies in the literature (5, 22, 23). Although the evidence here suggests that income-related inequalities in utilization of medical and dental services are slowly declining in the country, these inequalities remain significant. In other words, the gap between the rich and poor is still large, with the poor reporting lower health status and more health problems than the rich and yet utilizing fewer health services. Given the universality of the Brazilian health system, it may be mistakenly suggested that individuals' behavior toward health care may contribute to the existing inequity. Nevertheless, an individual's behavior is closely linked to characteristics of the health system such as quality, supply, and distribution of services (24). Considering that access problems are actually mentioned by the population as a barrier to enrolling in social protection programs, an individual's behavior toward health care utilization does not seem to be the most plausible explanation for the existing gap (25, 26).

The results of this study also shed some light on the conditions underlying the promotion of pseudo-universal access to health care. Approximately 75% of the population relies solely on the public health system, while only 25% of the population (those in higher income strata) has private health insurance coverage. This scenario illustrates the level of segmentation of the Brazilian health system, which contributes to income-related inequality in health and health care utilization. Inequalities in the supply and utilization of health services benefiting the rich and those with private insurance have been confirmed by other studies (22, 27).

This study presents important limitations that should be noted, including the use of self-reported information, specifically for health outcomes and health care utilization measures; changes introduced in the survey question for chronic diseases, which made comparison over time difficult; and lack of variables to assess quality of health care, which affect access and utilization of health care services. Self-reported health measures are themselves determined by health care utilization. Therefore, individuals with low levels of utilization are less likely to report health conditions that otherwise would be diagnosed, such as chronic diseases. Some bias may also exist due to differences in the actual and reported health status of individuals, which are influenced by different expectations for health, different cognitive processes, variations among socioeconomic groups, variations in cultural or gender norms, knowledge and information, or any other factor that may influence respondents' perceptions and understanding of their health problems (28). While the survey provides a wealth of information on personal and household characteristics, it was not designed primarily to test equity in health and health care. The available data and the methods used for

this study are limited to information on differences in quantities of health care utilization; therefore, the quality or appropriateness of health care cannot be assessed. Given the importance of health care quality to access and utilization of health services, dimensions ascribed to health care quality should be investigated. Regrettably, PNAD does not include sufficient quality measures to make such an assessment.

Despite these potential biases, the use of a very large sample size in this study provides high-precision estimates. In addition, these results are to be interpreted as a single dimension of socioeconomic inequalities in health and utilization of health care. Other methods should be used to complement and support these findings.

From a health policy perspective, this study provides important evidence of the direction of equity in the Brazilian health system over the 1998–2008 period, which can guide decision-making processes for the expansion and modification of policies and programs that have the potential to further reduce the still large income-related inequalities in health and health care utilization in the country. While the public health system seems to have had a positive impact on equity in health and health care since its creation, much remains to be done to ensure the ideal of universal access to health care.

To improve the evidence on equity and universality of the Brazilian health system, the results presented here should be complemented by studies on health care quality, health systems financing, out-of-pocket expenditures, and catastrophic expenditures of Brazilian households.

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RESUMEN

Análisis de la evolución y los determinantes de las desigualdades relacionadas con los ingresos en el sistema de salud de Brasil, 1998–2008

Objetivos. Analizar la evolución y los determinantes de las desigualdades relacionadas con los ingresos en el sistema de salud brasileño entre 1998 y 2008.

Métodos. Se utilizaron los datos de la Encuesta Nacional de Hogares de 1998, 2003 y 2008. La salud se midió según el estado de salud autoevaluado, las limitaciones físicas y las enfermedades crónicas. Las hospitalizaciones y las consultas médicas y odontológicas se usaron como medición indirecta de la utilización de la atención sanitaria, y los ingresos para estimar el nivel socioeconómico. Los índices de concentración para todas las variables dependientes se calcularon antes y después de su estandarización. Se empleó análisis de descomposición para identificar los principales determinantes de desigualdad en la utilización de la atención sanitaria.

Resultados. En los tres períodos analizados, las personas con menor nivel socioeconómico informaron un peor estado de salud, mientras que las de mayor nivel informaron más enfermedades crónicas y tuvieron una mayor utilización de la atención sanitaria (servicios médicos y odontológicos). A pesar de esto, la desigualdad en la utilización de la atención sanitaria relacionada con los ingresos ha ido disminuyendo. El seguro de salud privado, la educación y los ingresos son los principales factores que contribuyen a las desigualdades identificadas.

Conclusiones. Las desigualdades en la utilización de los servicios médicos y odontológicos relacionadas con los ingresos han disminuido gradualmente en Brasil. Esta disminución se asoció con la aplicación en el país de políticas y programas que favorecen la equidad, como el Programa de Agentes de Salud Comunitarios y el Programa de Salud Familiar.

Palabras clave Equidad en el acceso; equidad en salud; sistemas de salud; política de salud; Brasil.