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Private Health Care Coverage in the Brazilian population, according to the 2013 Brazilian National Health Survey

Deborah Carvalho Malta [1]
Sheila Rizzato Stopa [2]
Cimar Azeredo Pereira [3]
Célia Landmann Szwarcwald [4]
Martha Oliveira [5]
Arthur Chioro dos Reis [6]

Abstract *This study aims to present the percentages of the Brazilian population holding health insurance plans, itemized by social-demographic characteristics, based on the data of the National Health Survey carried out in 2013, and to compare this information with the administrative data of the National Supplementary Health Agency for the same year. Data from the National Health Survey, and from the Beneficiaries Information System of the National Health Agency for the year 2013, were used. The percentage of people having a health plan was described according to stratification for: all of Brazil, urban/rural, Brazilian official Regions, Brazilian States and state capitals, gender, age group, level of schooling, position in the workforce, ethnic classification, and self-assessed state of health. Results include the following: The percentage of people saying they had some health plan in Brazil was 27.9% (CI 95%: 27.1-28.8). A significant difference was found relating to level of schooling – the percentage being highest for those who stated they had complete secondary education (68.8% CI 95%: 67.2-70.4) and for those who said they were currently in work (32.5% CI 95%: 31.5-33.5). The increase in health plan coverage in the Brazilian population reflects the improvement of the suply of employment and the growth in the country's economy.*

Key words *Pre-paid health plans, Prevalence of private health plans, Epidemiological surveys, Health services, Brazil*

[1] Escola de Enfermagem, Universidade Federal de Minas Gerais. Av. Alfredo Balena 190, Santa Efigênia. 30130-100 Belo Horizonte MG Brasil. dcmalta@uol.com.br
[2] Departamento de Epidemiologia. Faculdade de Saúde Pública, Universidade de São Paulo. São Paulo SP Brasil.
[3] Diretoria de Pesquisas, Instituto Brasileiro de Geografia e Estatística. Rio de Janeiro RJ Brasil.
[4] Instituto de Comunicação e Informação Científica e Tecnológica em Saúde, Fundação Oswaldo Cruz. Rio de Janeiro RJ Brasil.
[5] Agência Nacional de Saúde. Brasília DF Brasil.
[6] Departamento de Medicina Preventiva, Universidade Federal de São Paulo. São Paulo SP Brasil.

Introduction

Brazil's Unified Health System (SUS) was brought into existence by the Federal Constitution of 1988[1], which is based on the principles of: universality, full coverage, and equity. It was further established that the private sector would organize itself in a manner complementary to the public sector[2]. Since then, rules and regulations have been established for the functioning of the supplementary sector, among them Law 9656 of 1998[3] ('Law 9656/98'), which sets rules for the functioning of the sector, and Law 9961/2000[4], which created the National Supplementary Health Agency (ANS), which was given the duty of preparing rules for the operators and inspecting them, including in relation to their content and their care models.

Health plan providers have been operating in Brazil since the 1940s[5,6]; the Supplementary Health subsector comprises the market for private healthcare plans. The commercial segment comprises cooperatives for medical work, dental care cooperatives, group medicine companies, self-management companies and the insurance companies[2,7]. Another segment, the non-profits, is not covered by the regulations of the sector and the ANS, and is part of the segment of Public Institutions, including institutions providing healthcare to government workers (municipal, state or military).

The sector has expanded and, at the end of the 1990s, the National Household Sampling Survey (*Pesquisa Nacional por Amostra de Domicílios*, or PNAD, of 1988[8], estimated that approximately 38.7 million Brazilians were covered by at least one health plan – then corresponding to 24.5% of the population. In the PNAD of 2003[9], it was estimated that 24.6% of the Brazilian population had at least one health plan, and in the year 2008[10] this had increased to 25.9%, or 49.2 million people. In 2013, in continuation of the health survey of the PNAD of previous years, the National Health Survey (*Pesquisa Nacional de Saúde* – PNS) was held, which included in its scope information about the characteristics of the Supplementary Health Sector, especially on coverage by territory. The PNS further expanded the subjects – including items such as chronic diseases, and lifestyle, among others[11].

Information on coverage of health plans in Brazil is important for monitoring regional trends, and social-demographic distribution, providing the possibility of improvement of the public regulation measures[11,12].

The objective of this article is to show the extent of coverage of the population by private health plans in Brazil, separated according to social-demographic characteristics, based on the data of the National Health Survey made in 2013, and to compare these data with administrative data from the National Supplementary Health Survey for the same year.

Methods

The data of the National Health Survey (PNS) were analyzed. This is a household-based survey carried out in Brazil in 2013 by the Brazilian Geography and Statistics Institute (*Instituto Brasileiro de Geografia e Estatística* – IBGE), in partnership with the Health Ministry. The PNS is part of the IBGE's Integrated Home Survey System (SIPD), and uses the Master Sample of that System, which has greater geographical spread and higher precision of estimates.

Cluster sampling was used, divided into three stages: The primary sampling unit was census sectors; the secondary unit, homes; and as the third unit, one adult member of the household (aged 18 or over). The homes and residents were selected by simple random sampling. The minimum size of the sample decided was 1,800 households per state of the Brazilian Federation; 81,767 households were initially selected, and the interviews obtained in 64,348 of them. Taking closed households into account, the proportion of losses was 20.8%, and the proportion of non-replies, 8.1%[13].

The estimates supplied by the PNS were weighted taking into account the weighting of the Primary Sampling Unit (UPA) in relation to the probability of being part of the survey, weighting of the household, with adjustments for correction for non-response and calibration of the population totals, and weighting of the residents selected, which further took into account the probability of selection of the resident, non-response adjustments by gender, and calibration for the population totals by gender and age groups estimated with the weight of all the residents. Other details on the process of sampling and weighting are available in prior publications[13,14].

The interviews were made using handheld computers (Personal Digital Assistants – PDAs), programed for critical entry of input values. The questionnaire of the PNS was divided into three blocks: 1) information about the home: one for

each home; 2) information on all the residents: one for each resident (the 'proxy' answered for the others living in the same household); and 3) resident selected: an adult resident (aged 18 or over) who was selected to answer the specific blocks of the questionnaire[14].

The information on possession of a health plan was obtained in the block for all the residents in the home. By this means the PNS collected valid information for 205,000 residents[14].

Information on possession of health plans was processed to produce the indicator:

1) Percentage of people having some health plan (medical or dental), in which the numerator was: Number of people who have some health plan; and the denominator was the sum of the number of residents of all the households visited. This indicator was analyzed according to social-demographic characteristics: Gender (male, female), age group (0 to 17, 18 to 29, 30 to 39, 40 to 59, 60 and over), level of schooling (none, or primary incomplete; primary complete and secondary incomplete; secondary complete and higher incomplete; and higher complete); status in the workforce (working, unemployed, or outside the workforce); state of health (very good and good, average, bad and very bad); location (urban, rural); Brazilian Region (North, Northeast, Southeast, South and Center-West); and finally for the whole of Brazil.

The figures for percentage of people having health plans, in the whole of Brazil and in the Brazilian States, were compared with administrative data of the Beneficiaries Information System of the National Supplementary Health Agency (ANS)[15] of December 2013, for comparison with the data collected by the PNS in 2013.

Other indicators were also investigated, also itemizing by social-demographic characteristics:

2) Percentage of people who have some health plan (medical or dental) as primary holder. Numerator: Number of people who have some health plan and are the nominal owner of the plan. Denominator: Number of people who have some health plan.

3) Percentage of people who have more than one health plan (medical or dental). Numerator: Number of people who have more than one health plan. Denominator: Sum of the number of residents of all the households visited.

4) Percentage of people who have some health plan only for dental care. Numerator: Number of people who have some health plan only for dental care. Denominator: Sum of the number of residents of all the homes visited.

5) Percentage of people whose principal (or sole) health plan is from a government workers' healthcare institution (municipal, state or military). Numerator: Number of people whose principal health plan is a government workers' healthcare institution. Denominator: Sum of the number of residents of all the households visited.

6) Percentage of people who have had a health plan for more than one year without interruption. Numerator: Number of people who have held a health plan for more than one year without interruption. Denominator: Sum of the number of residents of all the households visited.

7) Percentage of people with a plan who evaluate the principal health plan (medical or dental) as good or very good. Numerator: Number of people with a plan who assess the principal health plan (medical or dental) as good or very good. Denominator: People with a health plan.

Additionally, the formats for financing of the plan were described:

8) Percentage of people whose health plan is paid by the holder's employer; (Numerator: Number of people whose plan is paid by the employer. Denominator: People with a health plan).

9) Percentage of people whose health plan is paid by the holder through present or prior employment. Numerator: Number of people whose plan is paid by the holder through present or prior employment situation. Denominator: People with a health plan).

10) Percentage of people whose health plan is paid directly by the holder or another resident in the same home. Numerator: Number of people whose plan is paid directly by the holder or by another resident of the household. Denominator: People with health plans.

These indicators were analyzed by: Gender (male, female); age group (0-17, 18-29, 30-39, 40-59, 60 and over); and level of schooling (no schooling, or primary incomplete; primary complete and secondary incomplete; secondary complete and higher incomplete; and secondary complete).

The software *Stata*, version 11.0, was employed, using the *Survey* module, which takes into account effects of the sampling plan, presenting prevalences and respective 95% confidence intervals (CI 95%). The differences between the categories were evaluated by superposition of the confidence intervals.

The PNS was approved by the National Research Ethics Committee. All the individuals were consulted, informed and agreed to take part in the survey.

Results

Of the total of those interviewed by the PNS, the proportion who said they had some health plan (medical or dental) in Brazil was 27.9% (CI 95%: 27.1-28.8), there being no difference by gender. In age groups, the proportions were lower in the 0-17 and 18-29 age groups than in the older age groups (30-39, 40-59 and 60 and over). In level of schooling, the proportions increased according to the years of study. Thus, the proportion of people who said they had completed higher education and a health plan was 68.8% (CI 95%: 67.2-70.4), while for those without schooling or with incomplete primary education this proportion was 16.4% (CI 95%: 15.7-17.1) (Table 1).

For this same indicator, there were also significant differences for status in the workforce: The

Table 1. Brazilian National Health Survey, 2013: Percentage having some health plan (medical or dental), in each population category. Confidence interval: 95%. Categories: social-demographic, city/country, geographic (Brazilian official Regions).

Sub-category	% having some health plan	CI lower limit	CI upper limit	Estimated total number ('000)
Gender				
Male	27,0	26,1	27,9	26,045
Female	28.8	27.9	29.7	29,940
Age group (years)				
0-17	23.1	22.1	24.0	12,516
18-29	26.0	25.0	27.1	10,114
30-39	31.3	30.1	32.6	9,703
40-59	31.0	29.8	32.1	15,514
Over 60	30.8	29.3	32.3	8,138
Level of schooling				
No education, or primary incomplete	16.4	15.7	17.1	15,065
Primary complete, secondary incomplete	22.8	21.7	23.9	6,704
Secondary complete, higher incomplete	37.4	36.3	38.5	18,020
Higher education complete	68.8	67.2	70.4	12,733
Racial group				
White	37.9	36.6	39.2	34,856
Black	21.6	19.9	23.3	3,743
Mixed race	18.7	18.0	19.4	16,592
Workforce status				
In work	32.5	31.5	33.5	30,199
Out of work	16.3	14.4	18.1	926
Not in workforce	24.7	23.6	25.7	15,251
State of health				
Very good, or good	31.3	30.3	32.3	46,536
Average	19.1	18.2	20.0	8,245
Bad, or very bad	13.8	12.4	15.2	1,204
Home location				
Urban	31.7	30.7	32.7	54,136
Rural	6.2	5.2	7.2	1,849
Regions				
North	13.3	12.2	14.4	2,225
Northeast	15.5	14.6	16.5	8,639
Southeast	36.9	35.2	38.6	31,163
South	32.8	30.4	35.2	9,437
Center-West	30.4	28.7	32.0	4,521
All of Brazil	**27.9**	**27.1**	**28.8**	**55,985**

proportion of people who said they had a health plan was greater for those in work (32.5% – CI 95%: 31.5-33.5) than those out of work (16.3% – CI 95%: 14.4-18.1), or outside the workforce (24.7% – CI 95%: 23.6-25.7). Differences were also found: between those reporting their state of health to be good and very good (31.3% – CI 95%: 30.3-32.3) in relation to the others; and between those with urban and rural homes, the proportion being higher in those living in an urban area (31.7% – CI 95%: 30.7-32.7). By Brazilian Region, the largest proportion of people having a health plan was in the Southwest (36.9% – CI 95%: 35.2-38.6), and the lowest in the Northeast (13.3% CI 95%: 12.2-14.4) (Table 1).

The data obtained were also compared with administrative data of the ANS, relating to the same period investigated. Both the PNS and ANS showed the Region and State with highest percentage of health plans to be, respectively, the Southeast and São Paulo State. Correspondence and/or proximity was also observed between the data of the PNS and ANS in other locations, such as in the Northern Region, and in the states of Maranhão, Rio Grande do Norte and Alagoas. However, some states had quite different values: these included Paraná, Rio Grande do Sul, Mato Grosso do Sul, Mato Grosso, Goiás and the Federal District. Figure 1 shows the proportions of possession of health plans for Brazil, by Brazilian Region and by State, based on the data from the PNS and from the Beneficiaries Information System of the ANS.

Table 2 shows the other indicators researched, by gender of interviewee. There was a significant difference in possession of a health as primary owner: the proportion was greater for men (54.5% CI 95%: 53.5-55.5) than for women (41.8% CI 95%: 40.6-43.0). However, differences by gender were also found for: People whose health plan is paid by the nominal holder through work – greater in men (35.6% – CI 95%: 34.2-37.0); and People whose health plan is paid directly by the nominal holder, greater among women (27.7% – CI 95%: 26.5-28.8). The other indicators did not show significant differences.

Table 3 shows the indicators by interviewee age group. The proportion of people having an exclusively dental health plan was greater in the age group 30-39 (7.3% – CI 95%: 6.6-7.9) than in

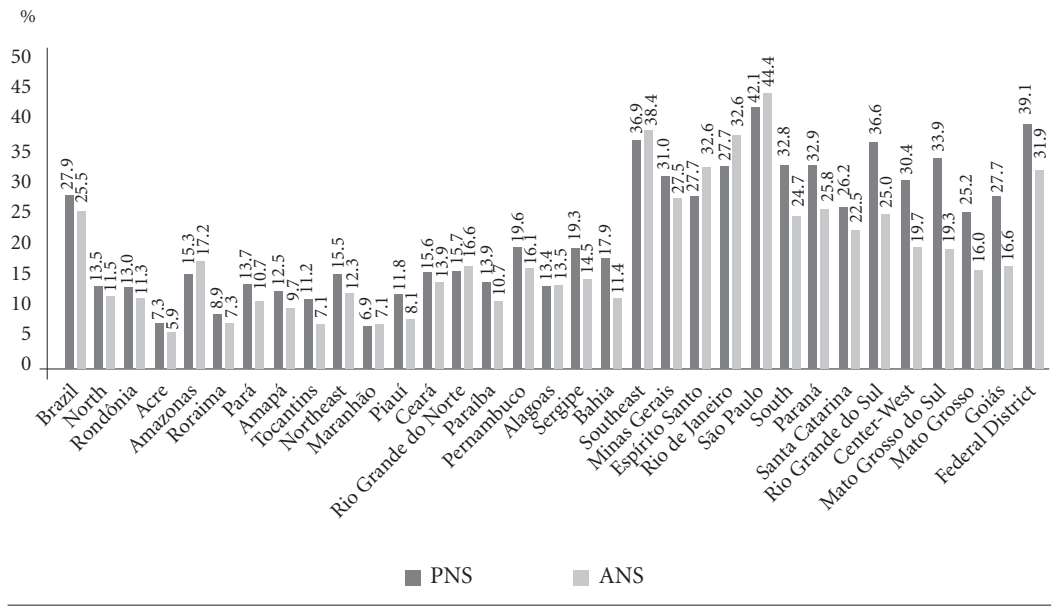

Figure 1. % of the researched population holding health plans – according to: (a) Brazilian National Health Survey ('PNS'), 2013; and (b) Beneficiaries Information System of the Brazilian National Supplementary Health Agency ('ANS'), 2013. For: whole of Brazil, Brazilian Regions, and by State.

Sources: (i) National Health Survey (PNS), 2013; (ii) Beneficiaries Information System of the National Supplementary Health Agency (ANS), December 2013.

Table 2. Holders of health plans in Brazil, by gender: (a) categories in population age over 18; (b) Categories in whole population researched. Confidence interval 95%. Brazilian National Health Survey, 2013.

Indicators	Total			Gender					
				Male			Female		
	%	CI 95%		%	CI 95%		%	CI 95%	
Population aged 18 and over:									
Have held a health plan (medical or dental) for more than one year without interruption	23.5	22.7	24.3	22.5	21.7	23.4	24.3	23.5	25.1
Have more than one health plan	2.7	2.4	2.9	2.6	2.3	2.8	2.7	2.5	3.0
Have an exclusively dental health plan	5.2	4.8	5.5	5.2	4.8	5.5	5.1	4.8	5.5
Have a health plan under a government workers' healthcare institution (municipal, state or military)	6.1	5.7	6.4	5.6	5.2	6.0	6.4	6.1	6.8
Population with a health plan:									
% with a health plan who assess their principal health plan (medical or dental) as good or very good	72.1	71.0	73.2	72.4	71.1	73.7	71.8	70.7	73.0
% who have some health plan (medical or dental) and are its nominal holder	47.7	46.9	48.5	54.5	53.5	55.5	41.8	40.6	43.0
Health plan is paid by the nominal holder's employer	32.4	31.3	33.4	32.3	31.0	33.6	32.4	31.3	33.6
Health plan is paid by the nominal holder through present or previous employment	31.6	30.4	32.7	35.6	34.2	37.0	28.0	26.8	29.3
Health plan is paid directly by the nominal holder	25.2	24.2	26.3	22.5	21.3	23.7	27.7	26.5	28.8

the others. For people with a government workers' institutional health plan, higher proportions were found in the 40-49 age group (8.0% – CI 95%: 7.4-8.6) and 60 or over (8.7% – CI 95%: 7.9-9.4). These age groups were also those with the highest proportions of holders of a health plan for more than one year without interruption. The proportion of people whose health plan was paid directly by the owner was highest in people aged 60 or over (43.5% – CI 95%: 41.1-45.8).

Table 4 shows the indicators by interviewee's level of schooling. In this comparison, several categories showed significant differences. The proportions were highest for those with complete higher education for the following categories: People holding a health plan in the status of primary holder (67.4% – CI 95%: 66.0-68.8); people with more than one health plan (8.5% – CI 95%: 7.6-9.4); people who have an exclusively dental plan (12.6% – CI 95%: 11.6-13.6); people with a government workers' institutional health plan (17.8% – CI 95%: 16.7-19.0); and people who have had a health plan for more than one year without interruption (63.4% – CI 95%: 61.7-65.1). There was a gradual increase in the proportions with the increase in level of schooling. Thus, the lowest proportions of holding of plans, mostly, were found in the category of people without schooling and/or without having completed primary education (Table 4).

Discussion

The proportion of people with health plans in Brazil has increased in the last five years, to 27.9%, or approximately 56 million Brazilians, in 2013. The proportion of plans is higher after the age of 30, and for those who are in the labor market, followed by retirees and the elderly. Further, it is higher among people with higher levels of schooling, and indeed is as much as four times higher among those with completed higher education; and slightly more frequent among women. The populations of the Southeastern and Northern regions have, respectively, the highest and the lowest proportions of health plan coverage. In urban regions health plans are four times more frequent than in rural areas.

The PNS showed an increase in the number of beneficiaries of health plans in Brazil, which may be explained by various components of the population, especially people with formal em-

Table 3. Holders of health plans in Brazil, by age group: (a) categories in population age over 18; (b) Categories in whole population researched. Confidence interval 95%. Brazilian National Health Survey, 2013.

Indicators	Total			Age groups					
				0–17			18–29		
	%	CI 95%		%	CI 95%		%	CI 95%	
Population aged 18 and over:									
Have held a health plan (medical or dental) for more than one year without interruption	23.5	22.7	24.3	17.4	16.5	18.2	20.1	19.2	21.1
Have more than one health plan	2.7	2.4	2.9	2.4	2.1	2.7	2.4	2.1	2.7
Have an exclusively dental health plan	5.2	4.8	5.5	4.7	4.3	5.1	5.5	5.0	6.0
Have a health plan under a government workers' healthcare institution (municipal, state or military)	6.1	5.7	6.4	4.3	4.0	4.7	4.6	4.2	5.1
Population with a health plan:									
Assess their principal health plan (medical or dental) as good or very good	72.1	71.0	73.2	72.8	71.1	74.6	73.3	71.6	75.0
Have some health plan (medical or dental) and are its nominal holder	47.7	46.9	48.5	3.5	2.9	4.2	48.2	46.3	50.2
Health plan is paid by the nominal holder's employer	32.4	31.3	33.4	48.6	46.8	50.5	35.4	33.4	37.3
Health plan is paid by the nominal holder through present or previous employment	31.6	30.4	32.7	20.1	18.5	21.7	34.2	32.2	36.2
Health plan is paid directly by the nominal holder	25.2	24.2	26.3	18.0	16.5	19.5	18.7	17.2	20.2

Indicators	Age groups								
	30–39			40–59			60 and over		
	%	CI 95%		%	CI 95%		%	CI 95%	
Population aged 18 and over:									
Have held a health plan (medical or dental) for more than one year without interruption	26.0	24.8	27.1	28.0	26.9	29.1	29.3	27.8	30.8
Have more than one health plan	3.5	3.1	3.9	3.1	2.8	3.4	1.7	1.4	2.1
Have an exclusively dental health plan	7.3	6.6	7.9	5.5	5.1	5.9	2.4	2.0	2.8
Have a health plan under a government workers' healthcare institution (municipal, state or military)	5.5	5.0	6.0	8.0	7.4	8.6	8.7	7.9	9.4
Population with a health plan:									
Assess their principal health plan (medical or dental) as good or very good	73.2	71.4	74.9	71.5	70.0	73.1	69.2	67.2	71.3
Have some health plan (medical or dental) and are its nominal holder	64.5	63.0	66.0	64.6	63.5	65.7	62.9	61.2	64.5
Health plan is paid by the nominal holder's employer	30.3	28.5	32.1	27.0	25.6	28.3	16.5	15.0	18.0
Health plan is paid by the nominal holder through present or previous employment	39.3	37.3	41.4	38.5	36.7	40.2	23.5	21.6	25.4
Health plan is paid directly by the nominal holder	23.0	21.2	24.7	27.2	25.7	28.7	43.5	41.1	45.8

Table 4. Selected indicators according to possession of health plans, by level of schooling. Confidence interval 95%. Brazilian National Health Survey, 2013.

Indicators	Total			Level of schooling											
				No education, or primary incomplete			Primary complete and secondary incomplete			Secondary complete and higher education incomplete			Higher education complete		
	%	CI 95%		%	CI 95%		%	CI 95%		%	CI 95%		%	CI 95%	
Population aged 18 and over:															
Have held a health plan (medical or dental) for more than one year without interruption	23.5	22.7	24.3	14.1	13.5	14.8	18.8	17.8	19.8	31.5	30.4	32.5	63.4	61.7	65.1
Have more than one health plan	2.7	2.4	2.9	1.2	1.1	1.4	1.9	1.6	2.3	3.6	3.2	4.0	8.5	7.6	9.4
Have an exclusively dental health plan	5.2	4.8	5.5	2.6	2.4	2.9	4.6	4.1	5.1	7.6	7.0	8.1	12.6	11.6	13.6
Have a health plan under a government workers' healthcare institution (municipal, state or military)	6.1	5.7	6.4	3.3	3.0	3.6	4.4	3.9	4.9	8.3	7.8	8.9	17.8	16.7	19.0
Population with a health plan:															
People who assess their principal health plan (medical or dental) as good or very good	72.1	71.0	73.2	68.2	66.4	70.0	71.1	69.0	73.3	73.1	71.7	74.5	74.8	73.2	76.4
% who have some health plan (medical or dental) and are its nominal holder	47.7	46.9	48.5	31.4	30.1	32.8	42.3	40.3	44.3	58.6	57.4	59.9	67.4	66.0	68.8
Health plan is paid by the nominal holder's employer	32.4	31.3	33.4	34.4	32.8	36.0	35.8	33.6	38.1	30.7	29.3	32.0	25.1	23.6	26.7
Health plan is paid by the nominal holder through present or previous employment	31.6	30.4	32.7	22.9	21.3	24.4	28.8	26.7	31.0	37.7	36.1	39.3	38.0	36.2	39.8
Health plan is paid directly by the nominal holder	25.2	24.2	26.3	27.1	25.5	28.7	24.4	22.4	26.4	22.4	21.1	23.7	29.7	28.0	31.5

ployment and companies, being led to acquire health plans as a result of the increase in the number of people employed, economic growth, and/or greater availability of money[10-12].

This increase coincides with the registration data of the ANS, identified by the Beneficiaries Information System. These data indicate that the number of beneficiaries in the year 2008 was approximately 40 million, increasing to 50 million in 2013, that is to say an increase of 25% in five years. However, it is emphasized that the data of the ANS refer to the number of health plans, and that one individual may have more than one. Also, the number of plans does not include plans for government workers, which are not under the regulation of the ANS[15].

Another item of data that is worth highlighting is that the majority of beneficiaries of health plans are affiliated to the collective plans[15]. This was already indicated by the 2008 PNAD[10], and also by the administrative information of the ANS, which indicates growth in corporate collective plans from 23.4 million in 2008 to 33.7 million in 2014, and collective plans by subscription

totaling 6.7 million, resulting in a total for 2013 of approximately 40 million collective plans, or approximately 75% of the market[16]. Some plans that are contracted collectively are sponsored by companies, and thus relate to the population involved in the labor market, that is to say, the population of working age[14,16].

Also, the increase in the supply of collective plans can be attributed to the legislation governing the sector, which sets measures such as maximum increases in rates for individual plans – while this is not the case for collective plans, for which it was supposed that the market would be able to regulate increases of prices. Thus, the collective plans became more competitive and attractive, as well as offering a large number of benefits, for the great majority of the population involved in the market – of productive age, younger and with a lower risk of becoming ill. These movements have the effect of increasing the cost of individual plans, leading to reduction of demand and supply[12].

Although the proportion of plans has increased, the regional variations have persisted. The differences between urban and rural populations were significant, as were also the differences between the Brazilian Regions and States. Data from previous PNADs showed a difference between figures in Brazil's Southern and Southeastern Regions and in its other regions. That difference persisted in this survey, which could be due to the higher concentration of wealth, jobs, and also the greater proportion of the total population in these regions[10,17]. The greatest growth in percentages of coverage, however, was in the Center-West Region: from 24.5% in 2008 to 30.4% in 2013 – an increase of 24%[14].

Another differential was the larger proportion of plans among people with higher levels of schooling. Schooling is regarded as a proxy for income, and has been indicated as a determining factor in access to health services[2,18,19]. Other studies also indicate that schooling is strongly associated with possession of a health plan[7,20,21].

The PNS shows a segment that is not covered by the administrative data of the ANS – the healthcare plans for state, municipal or military government workers. These are approximately 6.1% of the population, or approximately 12 million people, with the highest proportions in the Federal District, Goiás, Mato Grosso do Sul and Rio Grande do Sul, and also among people over the age of 40 and with higher levels of schooling. Thus, only data of the population base can be used to monitor the distribution of these plans[14]. This difference in the registration base of the ANS also explains the difference found in the related data of the PNS.

The PNS indicated that children and young people have lower percentages of coverage by health plans, which could be explained on the basis that they are healthier populations – so that families delay inclusion of their youngest in health plans. Also, the current legislation has created ten age groups and six bands for increases of health plan charges, requiring the costs of plans to be distributed between all groups and not concentrated among the oldest – this is referred to as the principle of inter-generation solidarity. Under this arrangement, charges are increased for the earlier age groups: populations up to the age of 59 pay higher monthly charges than the risk for their age, while the elderly pay lower monthly charges than the risk associated with their age range[22,23]. This mechanism also stimulated entry into health plans of people already in the labor market, in productive age groups – more usually enrolling in collective plans.

The PNS indicated a high participation of the elderly in health plans, which can be understood in terms of this age group's greater health needs, due to their higher probability of becoming ill. As age increases the demand for plans tends to increase, as people seek greater access to care[15,19]. Studies in Japan show that per capita expenditure on health for people over the age of 75 is 7.5 times the level for young people between age 15 and 19[24]. European studies also indicate that spending increases with age, to as much as a factor of 10 for people older than 70 compared to the expenditure for the age groups between 5 and 19[25]. This shows the importance of establishing inter-generation solidarity for coverage of common costs for the elderly[23].

In other countries, factors such as white skin, schooling level, income, older age groups and people being in the labor market are also associated with possession of a plan, and also lower levels of coverage among young people[26-28]. This pattern is repeated in Brazilian studies[11,29,30].

Self-evaluation of state of health is an indicator used internationally as an objective measure of potential for illness and use of services, and a powerful predictor of mortality. Thus it would seem to be an indication of greater use of services, and higher spending[31]. There was a greater possession of plans among people who assess their own state of health as good, possibly reflecting the greater concentration of plans among adults of productive age, due to their being in the la-

bor market and having access to collective plans. These populations are healthier and have lower risk of becoming ill. Further, populations with plans have higher levels of schooling and income and, in general, have better access to health services, healthcare and health-promoting practices, and thus make a better self-assessment of their own health[12,29,30]. The concentration among those that have a better state of health also reflects the growth of collective plans, with people who are younger and have lower risk of becoming ill. The high cost of individual plans, and the rule relating to pre-existing illness[13], both constitute difficulties for entry of people who are already ill.

Conclusion

The increase of the percentage of the Brazilian population who have health plans reflects the improvement in the supply of jobs and the growth of Brazil's economy.

Population-based data information presents a great challenge in showing the characteristics of the sector, such as the regional and social-demographic distribution of possession of health plans, and distribution by factors including age group, level of schooling, and income – and supports the public policies for regulation of the sector.

These data can support health policies, and indeed orient policies for regulation of the sector.

Collaborations

DC Malta, SR Stopa, CA Pereira, CL Szwarcwald, M Oliveira and AC Reis participated in the study design, data analysis and interpretation, writing, review and final approval of the article, and are responsible for all aspects including warranty accuracy and integrity.

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