

Health insurance coverage in Brazil: analyzing data from the National Health Survey, 2013 and 2019

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Abstract *This paper aimed to describe health insurance coverage in Brazil. Data from the 2013 and 2019 editions of the National Health Survey (PNS) were analyzed. The medical or dental health insurance coverage was analyzed according to demographic and socioeconomic characteristics, work status, urban/rural area, and Federation Unit. Coverage of medical or dental health insurance was 27.9% (95% CI: 27.1-28.8) for 2013 and 28.5% (95% CI: 27.8-29.2) for 2019. The results show coverage is still concentrated in large urban centers, in the Southeast and South, among those with better socioeconomic status and some formal employment. In 2019, only 30.7% of formal workers reported the monthly payment is made directly to the providers, while 72.7% of informal workers reported this information. About 92% of medical health insurance covers hospitalization, and almost 20% of women with health insurance are not covered for labor. Only 11.7% of women aged between 15 and 44 are covered for child-birth by health insurance. The results show the health insurance coverage is still quite unequal, reinforcing the Unified Health System (SUS) importance for the Brazilian population.*

Key words *Prevalence of private health insurance plan, Prepaid health insurance plan, Epidemiological surveys, Brazil*

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Introduction

The Brazilian health system is characterized by the coexistence of public and private services, both in physical structure and financing. On the one hand, the Unified Health System (SUS), based on the principles of universality, comprehensiveness, and equity, with national and comprehensive territorial coverage, offers free services to the entire population at all care levels. On the other, the private sector, idealized and standardized by the 1988 Federal Constitution¹ to be organized as a complement to public services provided by the SUS, offering services not covered by the public sector. However, in fact, an overlap of services is observed, where the private sector offers services that are already available free of charge in the public sector. Thus, the private insurance and plan market operates in a supplementary manner, generating duplicate coverage, where health care holders can access both public and private services^{2,3}.

Santos *et al.*² point out that this type of coverage can generate some problems both concerning access to health services and public expenditure, because besides continuing to use public services, spending on health insurance plan payment is deducted from income tax due, transferring spending on the private health sector to the government.

Health insurance plans have been in force in Brazil since 1940⁴. In 2000, the National Supplementary Health Agency (ANS) was established under Federal Law N° 9.961^{5,6} to regulate the sector, developing rules and supervising health plan providers.

In 1998, the health supplement of the National Household Sample Survey (PNAD) of the Brazilian Institute of Geography and Statistics (IBGE) estimated that a health insurance plan covered 24.5% of the Brazilian population. This proportion remained stable until 2003 when coverage of 24.6% was estimated (data obtained from the health information page of the DATASUS Tabnet, in the submenu of surveys and studies – http://tabnet.datasus.gov.br/cgi/menu_tabnet_php.htm#).

In 2013, IBGE, the Ministry of Health (MS), and the Oswaldo Cruz Foundation (Fiocruz) went to the field with the National Health Survey (PNS) to produce nationwide data on the health situation and lifestyles of the Brazilian population^{7,8}. The PNS, which replaced the PNAD health supplement, estimated a health insurance plan coverage of 27.8% for the Brazilian population. The PNS was rerun in 2019.

Monitoring the health insurance plan coverage is essential for the regulation of the sector and health managers, in the planning of the public health sector, concerning the provision of services and the size of the population covered only by the SUS.

This paper aims to describe the health insurance coverage estimated for 2013 and 2019 through the two editions of the PNS, stratifying by sociodemographic, economic, and work features, evaluating, when possible, the differences in medical-hospital and dental coverage.

Methods

This study analyzed data from the National Health Survey conducted in two editions, in 2013 and 2019. The 2019 National Health Survey 2019 (PNS/2019) is a household survey conducted by the Brazilian Institute of Geography and Statistics (IBGE) in partnership with the Ministry of Health (MS). It aims to produce data on the health situation and lifestyles of the Brazilian population. The PNS/2019 questionnaire was divided into three parts: (1) household information, (2) information about all residents, and (3) information about an individual aged 15 years or more selected at random. The target population consisted of people residing in permanent private households (PPH) throughout the national territory.

PNS/2019 is part of the Integrated Household Survey System (SIPD), whose sample structure is the Master Sample. The Master Sample is a set of census tracts or tract aggregates selected to meet the various surveys carried out by IBGE. These sectors underpin the primary sampling units of the surveys and are stratified according to four criteria: Administrative (Federation Units-UF, capitals, Metropolitan Regions, Integrated Economic Development Region-RIDE, and other UF sectors); Geographic (Subdivisions of capitals and other large municipalities in areas such as districts, sub-districts, and neighborhoods); Type of census tract (urban and rural), and a statistical criterion, which subdivides the strata based on the three criteria mentioned above into homogeneous strata, according to information on total household income and number of private households⁸.

The PNS/2019 adopted a three-stage probabilistic cluster sampling. In the first stage, 8,036 primary sampling units (PSU) were selected within the amount of PSU of the Master Sample,

respecting its stratification. PSUs correspond to census tracts or tract groups. In the second stage, 12 to 18 households were selected in each PSU, totaling 108,525 households. In the third stage, an individual aged 15 years or older was randomly selected within each household to answer the third part of the questionnaire, referring to the selected person.

The final sample corresponds to 94,114 households with an interview, with a response rate of 93.6%. The expansion factors correspond to the inverse of the selection probabilities' product at each stage, including an adjustment factor for losses. The expansion factors were calibrated considering population projections for Brazil and Federation Units⁹.

The 2013 National Health Survey (PNS/2013) has a similar sample design, with a sample of 64,348 households. Further details can be obtained in Souza Junior et al.⁸. This study used data referring to all residents of the selected households from both editions of the PNS.

The IBGE carried out a new calibration of the expansion factors of the PNS/2013 to allow comparisons between the 2013 and 2019 editions of the PNS, considering the revision of the Population Projection of the Federation Units by gender and age for the 2010-2060 period, released in 2018. This same population projection was used to calibrate the PNS/2019 weights, thus ensuring comparability between the two editions of the survey.

The PNS/2019 has two questions on having a health insurance plan: "Do you have any private, company, or public agency dental insurance plan?" and "Do you have any private, company, or public agency medical insurance plan?". However, in the PNS/2013, a single question encompassed both types of coverage: "Do you have any private, company or public agency health, medical, or dental plan?". While there is another question about having an exclusively dental health plan: "Do you have a health plan just for dental care?", it does not allow separating those with only medical coverage. For this reason, we decided to jointly evaluate medical or dental coverage in comparing 2013 and 2019.

The medical or dental health insurance plan coverage was analyzed according to variables gender (male and female); age group (<18, 18-29, 30-59 and 60 years and over); ethnicity or skin color (white, black, brown, and other); schooling level (incomplete elementary school or equivalent – including illiterate, complete elementary school or equivalent, complete high school or equivalent

and complete higher education and over); per capita household income range, in minimum wages (MW) (up to ¼ MW, more than ¼ and up to ½ MW, more than ½ and up to 1 MW, more than 1 and up to 2 MWs, more than 2 and up to 3 MWs, more than 3 and up to 5 MWs, and more than 5 MWs); workforce status (in the workforce, outside the workforce) and employment status (employed and unemployed). The PNS/2019 work questions allow differentiating, among the employed, those who have a formal job, such as civil servants, and employees with a formal contract. Therefore, for 2019, a variable called "Formal employment and workforce status" was created, with the following categories: formal employment (civil servant, worker with a formal contract, employer, or military), without a formal contract, unemployed, and out of the workforce.

Having a health insurance plan was also analyzed according to the Federation Unit (UF), Geographic Region (North, Northeast, Southeast, South, and Center-West), Type of Census tract (urban or rural) and type of area: capital, Metropolitan Region, RIDE (Integrated Development Region) and rest of FU).

We analyzed the level of satisfaction for those with a medical health insurance plan through the following question, "How do you evaluate your health insurance plan?", with the following response options: very good, good, fair, poor, and very poor. In this study, the percentage of people who said the health plan was good or very good was calculated. This indicator was only calculated for 2019, since, in 2013, this question was asked of all individuals with a medical or dental health insurance plan, and, in 2019, only those with a medical health insurance plan were able to answer it, hindering comparison.

For 2019, we assessed whether the medical health insurance plan covers hospitalizations and labor among women, and coverage was analyzed according to the variables previously described. However, per capita income has been recoded into four categories (up to ½ MW, more than ½ to 1 MW, more than 1 to 2 MWs, and more than 2 MWs), to increase the accuracy of the estimates, given that these analyses were limited to those with health insurance.

For the population covered by a medical health insurance plan in the PNS/2019, the question "Who pays the monthly fee for this health insurance plan?" was also analyzed, considering the following response options: only the employer (current or previous), a part paid by the policyholder and the other part by the employer

(current or former), and the policyholder only, directly to the plan. These three options represent 95% of the total answers to this question. The other options were: only another resident of the household, a non-resident of the household, and other, and were added to an option called "Others". The analysis of who pays the monthly fee for the medical health insurance plan was made according to the occupation and workforce (described above).

Finally, to assess differences in the type of coverage according to the ranges of per capita household income and the situation regarding occupation and workforce, for 2019, a variable was created with the type of health insurance plan, specifying whether the plan was exclusively medical, simultaneously medical and dental, or exclusively dental.

The estimates were obtained considering the two surveys' sample design, including the expansion factors and the cluster effects. Data were analyzed using the statistical package IBM SPSS Statistics, version 21¹⁰, through the Complex Sample module. Percentages and their respective confidence intervals (95%) were calculated. Wald's adjusted F test was used to verify the significant association between categorical variables.

Student's t-test for independent samples was employed to test for differences between the proportions estimated for 2013 and 2019, considering that the samples were selected independently in the survey's two editions. The estimated proportions and their respective variances were calculated considering the intricate design of the samples¹¹, and we considered significant differences those with p-value less than 0.01¹² due to the multiple comparisons and the sample size in the two surveys.

Results

In 2019, the coverage of medical or dental health insurance plans was estimated at 28.5% (95% CI: 27.8%-29.2%), representing a population of 59.7 million people, slightly higher than the estimate of 55.7 million people covered in 2013 (27.9%; 95% CI: 27.1%-28.8%), although this difference was not significant. Health insurance coverage is concentrated in urban areas (37.7% in 2013 and 32.2% in 2019), in capital cities (40.1% in 2013 and 42.4% in 2019), in the Southeast (37.5% in 2019), and South (32.8% in both periods).

A strong gradient concerning education and per capita income was observed, and the greater

the coverage, the higher the education and income, reaching 88% (in 2019) among those with per capita income greater than five MWs (Table 1). Coverage was also higher among the employed, reaching 47.4% (in 2019) among those with jobs considered formal by this study: civil servants, military personnel, employers, and employees with a formal contract (Table 1).

Figure 1 shows the coverage of the medical or dental health insurance plan by Federation Unit (UF) for 2013 and 2019. The highest coverage was in São Paulo, Rio de Janeiro, Rio Grande do Sul and the Federal District. While coverage increased in some UFs and decreased in others, the differences were not significant, with the exception of Piauí, whose coverage climbed from 11.8% (95% CI: 10.2%-13.6%) to 16.7% (95% CI: 14.3%-19.4%), and Rio de Janeiro, which went from 32.5% (95% CI: 30.3%-34.9%) to 37.7% (95% CI: 35.7%-39.8%). Mato Grosso and Mato Grosso do Sul showed the largest reductions in timely coverage estimates; however, with p-values greater than 0.01 (0.021 and 0.011, respectively). The proportion of people who consider the health insurance plan to be good or very good was 79.2% (95% CI: 78.3%-80.0%) for Brazil, considering only 2019. Northeast residents evaluated the health insurance plan as good or very good in a lower proportion (73.8%), while 82% was achieved in the South (Table 2).

Among those with a medical health insurance plan, according to PNS/2019 data, the plan covered hospitalization in 91.6% of cases, with this percentage ranging from 80% among those with per capita income up to a quarter of the MW and 96.6% among those with a higher education level. For women who reported having a health plan, delivery care coverage was 80.3%, ranging from 61.2% among those under 18 years of age to 87.9% among women with higher education (Table 2).

Regarding the payment of health insurance plan monthly payments, considering the PNS/2019 data, about 47% of the holders make the payment directly to the plan provider, with 72.7% among those employed in a formal contract and 30.7% among those with formal employment (Figure 2). The PNS/2019 differentiates between those with exclusive medical coverage, simultaneous medical and dental coverage, and exclusive dental coverage. People with exclusive dental coverage are higher among those with worse socioeconomic conditions and the unemployed (Figure 3). For the total Brazilian population, 26% (95% CI: 25.3%-26.8%) have health

Table 1. Proportion (%) of people with medical or dental health insurance and 95% confidence interval, according to sociodemographic characteristics. Brazil, 2013 and 2019.

Variables	2013		2019	
	%	(95%CI)	%	(95%CI)
Brazil	27.9	(27.1-28.8)	28.5	(27.8-29.2)
Sex				
Male	27.0	(26.1-27.9)	27.4	(26.6-28.2)
Female	28.8	(27.9-29.7)	29.5	(28.8-30.3)
Age group				
<18	23.1	(22.1-24.1)	25.4 ^a	(24.5-26.4)
18-29	26.1	(25.1-27.1)	25.3	(24.4-26.1)
30-59	31.1	(30.2-32.1)	30.9	(30.1-31.8)
60+	30.8	(29.4-32.3)	30.2	(29.2-31.3)
Race/Skin color				
White	37.9	(36.6-39.2)	38.8	(37.7-39.9)
Black	21.6	(20.0-23.3)	21.4	(20.3-22.6)
Brown	18.7	(18.0-19.4)	20.1 ^a	(19.5-20.7)
Other	32.7	(28.5-37.1)	30.6	(26.2-35.4)
Highest schooling level achieved				
Incomplete elementary or equivalent (including illiteracy)	16.4	(15.7-17.2)	16.1	(15.5-16.7)
Complete elementary or equivalent	22.8	(21.7-23.9)	20.8 ^a	(20.0-21.7)
Complete high school or equivalent	37.4	(36.4-38.4)	34.1 ^a	(33.3-34.9)
Higher education	68.8	(67.2-70.4)	67.6	(66.4-68.8)
Per capita household income				
Up to ¼ minimum wage	5.0	(3.9-6.2)	3.0 ^a	(2.6-3.5)
More than ¼ up to ½ minimum wage	7.2	(6.5-8.0)	7.5	(6.9-8.2)
More than ½ up to 1 minimum wage	17.1	(16.2-18.1)	17.7	(16.9-18.5)
More than 1 up to 2 minimum wages	34.8	(33.5-36.2)	35.7	(34.7-36.8)
More than 2 up to 3 minimum wages	56.5	(54.3-58.6)	54.8	(53.0-56.7)
More than 3 up to 5 minimum wages	67.5	(65.0-69.9)	72.2 ^a	(70.3-73.9)
More than 5 minimum wages	84.1	(82.2-85.9)	88.0 ^a	(86.6-89.2)
Workforce status				
In the workforce	31.6	(30.6-32.5)	31.7	(30.9-32.5)
Out of the workforce	24.7	(23.7-25.7)	24.5	(23.7-25.3)
Employment status				
Employed	32.5	(31.5-33.5)	33.3	(32.5-34.2)
Unemployed	16.3	(14.6-18.2)	15.0	(13.9-16.1)
Formal employment status				
Formally employed*	-	-	47.4	(46.4-48.5)
Informally employed	-	-	19.1	(18.4-19.9)

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insurance with medical coverage, and 2.5% (95% CI: 2.3%-2.6%) have exclusive dental coverage (data not shown in the figure).

Discussion

The percentage of people covered by health insurance remained stable in this period. Despite the growing trend of this percentage over the last few years, ranging from 24.5% in 1998¹³ to 28.5% in 2019, the variation between 2013 and

Table 1. Proportion (%) of people with medical or dental health insurance and 95% confidence interval, according to sociodemographic characteristics. Brazil, 2013 and 2019.

Variables	2013		2019	
	% (95%CI)		% (95%CI)	
Type of census tract				
Urban	31.7	(30.7-32.7)	32.2	(31.3-33)
Rural	6.2	(5.3-7.3)	7.0	(6.3-7.8)
Area type				
Capital	40.1	(38.9-41.3)	42.4*	(41.1-43.7)
Rest of MR (Metropolitan Region, excluding the capital)	31.3	(29.6-33.1)	32.6	(30.9-34.4)
RIDE (excluding the capital)	14.0	(10.6-18.2)	18.7	(12.7-26.7)
Rest of FU (Federation Unit, excluding the metropolitan region and RIDE)	22.3	(21.1-23.5)	21.8	(20.9-22.9)
Region				
North	13.3	(12.3-14.5)	14.7	(13.6-16.0)
Northeast	15.5	(14.6-16.4)	16.6	(15.8-17.4)
Southeast	36.9	(35.2-38.6)	37.5	(36.0-39.0)
South	32.8	(30.5-35.2)	32.8	(31.3-34.3)
Center-West	30.3	(28.7-32.1)	28.9	(27.2-30.7)

* Public servant, formal employee, employer, or military. * Significant difference between the 2013 and 2019 estimates, based on a p-value < 0.01 in the Student's t-test for independent samples.

Source: National Health Survey (PNS), 2013; 2019.

2019 was negligible and not significant. However, a variation was observed in some strata of the population. Health insurance coverage decreased significantly among those with per capita household income of up to a quarter of the MW and individuals with complete elementary and high school education. A significant increase in this coverage was identified among people with better per capita household income, above three minimum wages, and people residing in capitals.

Data from the Health Plans Pricing Panel of the National Supplementary Health Agency (ANS), July 2020 edition, show that the average commercial value of health insurance plans contracted by the business group modality, which gathers almost 70% of users, had an increase of 27% between 2016 and 2019, from 391 to 495 Brazilian Reals (Panel accessed on November 19, 2020, through the link: <http://www.ans.gov.br/aans/noticias-ans/numeros-do-setor/5980-ans-disponibiliza-painel-de-precificacao-em-novo-formato>). This increase also occurred among health insurance plans contracted individually and by group adherence. In the same period, the official minimum wage hiked from 880 reais in 2016 to 998 reais in 2019, an increase of 13%.

According to PNS/2013 and PNS/2019 data, the proportion of unemployed people, that is,

those within the workforce who are unemployed, hiked from 5.8% (95% CI: 5.5%-6.0 %) in 2013 to 9.1% (95% CI: 8.8%-9.4%) in 2019 (estimates made by the authors). Considering that most health insurance plans are contracted through an employer, this can impact coverage by health insurance plan.

Despite the limitations of the previous paragraphs' indicators, this information produces some hypotheses about the reduced coverage in some socioeconomic strata and the maintenance of the percentage of people covered by health insurance in Brazil.

Another critical issue that can guide this debate is expanding the Family Health Strategy (ESF), mainly in cities in the inland and metropolitan regions and areas where populations with lower socioeconomic status reside. Pinto & Giovanella¹⁴ estimate that the ESF coverage (initially the Family Health Program) went from 4.4% in 1998 to 70% in 2017, highlighting that coverage reached 76.5% in the country's inland municipalities while achieving 45.5% in the capitals. This increase in access to health services may have discouraged low-income households from contracting health plans.

The results of this study show that the health insurance plan coverage is still concentra-

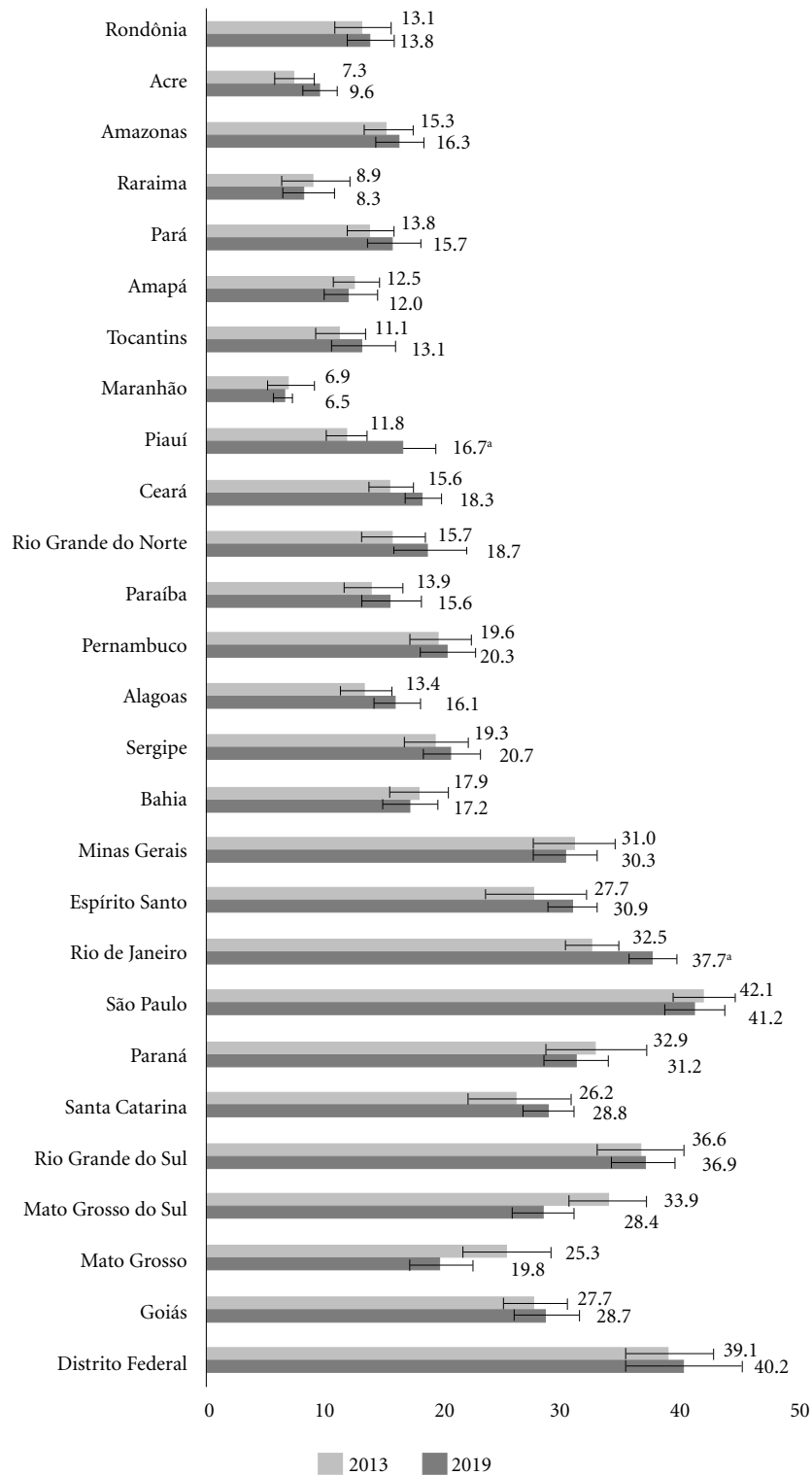


Figure 1. Health insurance coverage by Federation Unit. Brazil, 2013 and 2019.

^a Significant difference between the 2013 and 2019 estimates, based on a p-value < 0.01 in the Student's t-test for independent samples.

Table 2. Proportion(%) of policyholders with good or very good health insurance evaluation, hospitalization coverage, and labor coverage among women according to sociodemographic characteristics. Brazil, 2019.

Variables	2019					
	Health insurance evaluation good or very good		Hospitalization coverage		Labor coverage (only women)	
	% (95%CI)		% (95%CI)		% (95%CI)	
Brazil	79.2	(78.3-80.0)	91.6	(90.9-92.2)	80.3	(79.0-81.5)
Sex ^b						
Male	79.7	(78.6-80.6)	92.5	(91.7-93.1)	-	-
Female	78.8	(77.9-79.7)	90.7	(89.9-91.5)	-	-
Age group ^{a,c}						
<18	81.0	(79.6-82.4)	93.7	(91.1-95.6)	61.2	(45.1-75.1)
18-29	79.8	(78.3-81.3)	90.3	(88.8-91.6)	82.1	(79.5-84.4)
30-59	79.1	(78.0-80.1)	91.9	(91.1-92.6)	84.1	(82.8-85.4)
60+	76.9	(75.4-78.3)	91.4	(90.3-92.3)	74.2	(72.1-76.2)
Race/Skin color ^{b,c}						
White	80.0	(78.9-81.1)	92.8	(92.0-93.4)	81.0	(79.4-82.5)
Black	76.6	(73.9-79.0)	87.4	(85.4-89.2)	74.8	(71.1-78.1)
Brown	78.3	(77.0-79.5)	90.7	(89.7-91.6)	80.4	(78.5-82.2)
Other	75.4	(68.6-81.1)	86.5	(73.3-93.8)	76.8	(64.7-85.6)
Highest schooling level achieved ^{b,c}						
Incomplete elementary or equivalent (including illiteracy)	77.9	(76.5-79.3)	83.4	(81.5-85.1)	66.1	(62.6-69.3)
Complete elementary or equivalent	78.3	(76.1-80.3)	86.9	(84.7-88.9)	69.7	(64.9-74.1)
Complete high school or equivalent	78.7	(77.4-79.8)	90.3	(89.3-91.3)	80.2	(78.2-82.0)
Higher education	80.1	(79.0-81.1)	96.6	(96.0-97.1)	87.9	(86.6-89.0)
Per capita household income ^{b,c}						
Up to ½ minimum wage	77.8	(73.5-81.6)	80.0	(75.1-84.1)	63.3	(56.9-69.1)
More than ½ up to 1 minimum wage	76.8	(74.4-78.9)	84.2	(82.0-86.2)	70.0	(66.5-73.3)
More than 1 up to 2 minimum wages	79.2	(77.4-80.8)	89.3	(88.2-90.4)	77.4	(74.7-79.8)
More than 2 minimum wages	80.2	(79.0-81.4)	95.9	(95.3-96.4)	86.0	(84.7-87.2)
Workforce Status ^{a,b,c}						
In the workforce	79.3	(78.3-80.2)	92.0	(91.3-92.7)	83.8	(82.5-84.9)
Out of the workforce	77.4	(76.1-78.7)	90.1	(88.7-91.2)	75.3	(73.3-77.2)
Employment Status						
Employed	79.4	(78.4-80.3)	92.0	(91.4-92.7)	83.7	(82.4-84.9)
Unemployed	76.4	(72.3-80.1)	91.0	(86.0-94.3)	85.6	(79.6-90.1)
Formal employment status ^{b,c}						
Formally employed*	79.9	(79.0-80.9)	92.6	(91.9-93.2)	85.4	(84.1-86.6)
Informally employed	77.9	(76.1-79.6)	89.9	(88.2-91.4)	77.9	(74.8-80.8)

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ted in large urban centers, in the Southeast and South, among those with better socioeconomic status, and those with some formal employment relationship, with a formal contract, such as employers or public servants and the military. Other studies have also found these features among people with health insurance^{13,15-19}.

The percentage of having a medical or dental health insurance plan was 32.6% among people living in municipalities in the Metropolitan Regions (excluding the capitals). However, coverage is 18.7% in the Integrated Development Regions-RIDE (excluding the capitals) and is less than the inland municipalities' coverage (the rest

Table 2. Proportion(%) of policyholders with good or very good health insurance evaluation, hospitalization coverage, and labor coverage among women according to sociodemographic characteristics. Brazil, 2019.

Variables	2019					
	Health insurance evaluation good or very good		Hospitalization coverage		Labor coverage (only women)	
	% (95%CI)		% (95%CI)		% (95%CI)	
Type of census tract ^{b,c}						
Urban	79.2	(78.3-80.0)	91.8	(91.1-92.4)	80.5	(79.3-81.8)
Rural	80.0	(76.5-83.1)	85.6	(82.3-88.3)	70.2	(65.1-74.9)
Area type ^{b,c}						
Capital	79.2	(78.2-80.2)	94.5	(93.9-95.1)	82.3	(81.0-83.5)
Rest of MR (Metropolitan Region, excluding the capital)	78.2	(76.2-80.0)	89.1	(87.7-90.4)	80.5	(78.1-82.8)
RIDE (excluding the capital)	79.3	(64.6-89.0)	87.5	(76.8-93.6)	70.6	(54.9-82.7)
Rest of FU (Federation Unit, excluding the metropolitan region and RIDE)	79.6	(78.0-81.1)	90.1	(88.8-91.3)	78.4	(76.0-80.7)
Region ^{a,b,c}						
North	77.1	(73.4-80.4)	93.8	(92.2-95.2)	82.6	(79.7-85.1)
Northeast	73.8	(71.9-75.6)	93.3	(92.0-94.5)	81.4	(79.4-83.3)
Southeast	79.4	(78.1-80.7)	92.2	(91.2-93.0)	81.4	(79.4-83.2)
South	82.4	(80.8-83.9)	86.8	(85.2-88.3)	72.8	(70.2-75.2)
Center-West	81.7	(79.9-83.4)	93.1	(91.5-94.5)	85.0	(82.4-87.2)

* Public servant, formal employee, employer, or military. ^a p <0.01 in the Wald test of association with the variable "Considers the health plan good or very good". ^b p <0.01 in the Wald test of association with the variable "Health insurance plan covers hospitalization?". ^c p <0.01 in the Wald test of association with the variable "Health insurance plan covers childbirth".

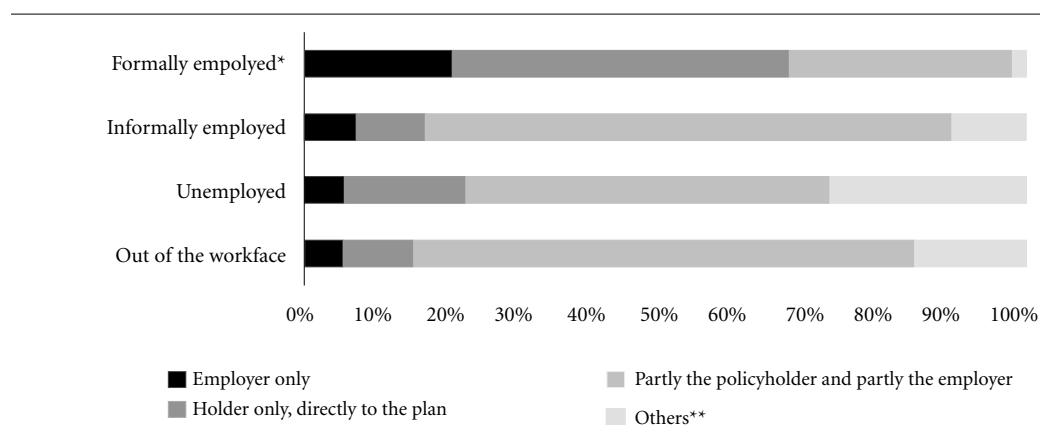


Figure 2. Distribution of health insurance holders responsible for the monthly fee according to workforce status and formal employment situation. Brazil, 2019.

* Public servant, formal employee, employer, or military. ** Aggregation of the categories "Only another resident of the household", "Person not resident of the household" and "Other".



Figure 3. Distribution of the type of health insurance coverage according to per capita household income, workforce status and formal employment situation. Brazil, 2019.

* Public servant, formal employee, employer, or military.

of the municipalities of the UFs, except for the capitals, MR, and RIDE). Although these areas are similar to the MRs, except for the fact that they incorporate municipalities from different UFs, they have a more deficient structure and a resident population with worse socioeconomic conditions, with almost 70% of their entire population aged 14 or over with a per capita income of up to one minimum wage, according to data from the PNS/2019. These results show the need for public health services to be sufficient to meet the demands of the population of these RIDEs. The study by Fernandes *et al.*²⁰ carried out in 2012 with the population of Entorno Norte, a sub-region of the RIDE of the Federal District (RIDE-DF), states that 38% of all local health institutions are private units and this may indicate the lack of public health services in this region. Likewise, analyzing data for 2010 and 2011 from Entorno Sul of RIDE-DF, Rocha²¹ states that only 20.4% of households in the region were registered in the Family Health Strategy (ESF) between 2010 and 2011 and this rate was well below the mean national ESF coverage at the time (54%).

Concerning the highest percentage of having a medical or dental health insurance plan among the more formalized workers, Machado *et al.*¹⁸

also found a positive relationship between these and their income with the health insurance plan coverage, and highlighted that: “*This relationship suggests the role of large, public or private, companies in creating a more ‘protected’ labor market, contributing collaterally to foster the market for private group plans.*” The authors emphasize that these differences between formal and informal jobs, such as the provision of health insurance for workers, further promote segmentation and hinder workers’ mobility between these groups, as workers with greater access to the health insurance plan can accumulate human capital better.

Another relevant difference regarding workers with formal employment and those with informal work is that a plan’s costs are quite different, even when both are health insurance beneficiaries. Among formal workers, only 30.7% reported that the monthly payment is made directly to the provider, while 72.7% of informal workers pay plans in this way. In other words, the costs of the health insurance plan are much higher for informal workers, compromising a larger portion of their wages. A survey using data from the 2002-2003 Consumer Expenditure Survey (POF), a population survey conducted by IBGE, analyzed catastrophic health expenditure, which

is when health spending is greater than or equal to 40% of households' payment capacity. Based on the results, the authors suggest that households with health insurance are often exposed to a greater risk of catastrophic health expenditure than those without insurance²².

We can also point out that among the unemployed people, those looking for a job, only 15% (in 2019) reported having health insurance. While the SUS covers the entire Brazilian population, those who have access to private health services through the plan have dual coverage and greater access to services, as they can choose services from both sectors^{2,23}. The supply of private beds is much greater than that of public beds (SUS). Santos et al.² estimated it at 2.9 beds/thousand inhabitants, against 1.8 beds per thousand inhabitants in the SUS, with 60% higher supply of beds per inhabitant in the private sector in 2005. Also noteworthy is the difference in the supply of medium- and high-complexity equipment. The private network has approximately four times more computed tomography per inhabitant and five times more mammography and ultrasonography per inhabitant than those available on the public network². A study conducted with data from the Surveillance System for Risk and Protective Factors for Chronic Diseases by Telephone Survey (Vigitel) in 2015 showed that, for all Brazilian capitals, mammography tests for women between 50 and 69 years old and the Pap smear, for women aged 25 to 64 years, was higher in the population covered by health insurance, even after stratification by socioeconomic level¹⁷. Health services' usage rates are higher among people covered by the health insurance plan²⁴.

About 92% of medical health plans cover hospitalization, with just over 8% outpatient coverage only. Looking at the data available on the website of the National Supplementary Health Agency (http://www.ans.gov.br/anstabnet/cgi-bin/dh?dados/tabnet_br.def - access on October 29, 2020), for December 2019, about 4% of health insurance plan beneficiaries have plans with outpatient coverage only. Our results show a gradient of hospitalization coverage according to the level of education and the per capita income classes, and the higher the coverage, the higher the education and income. About 20% of people with per capita income up to a quarter of the minimum wage and who reported having a plan do not have coverage for hospitalization, reinforcing the importance of the SUS for this population. Analyzing data from the 2008 National Household Survey (PNAD), Porto et al.²⁴ reported

that “no less than 9% of the surgeries performed by the SUS were used by these people who have dual health care coverage”, referring to people covered by a health insurance plan.

Almost 20% of women with health insurance do not have delivery coverage and have to resort to the SUS or direct payment to perform it. This percentage also varies by socioeconomic level, with only 63.3% for those with per capita household income of up to a quarter of the minimum wage, reaching 86% among those with per capita income greater than two minimum wages. These results show the importance of the SUS and public policies aimed at women's health and delivery care, as only 11.7% of Brazilian women aged 15-44 have delivery coverage through the health insurance plan. Porto et al.²⁴ affirm that, in 2008, 97.7% of normal deliveries and 58.4% of cesarean deliveries were financed by the SUS.

Finally, this study showed that the proportion of exclusively dental insurance plans is higher among those with lower socioeconomic status, suggesting that this population must have some difficulty accessing dental care at the SUS, compromising part of their income to this type of health insurance plan. This percentage was also higher among unemployed people. A study carried out in 2005 in four municipalities in the state of Rio de Janeiro showed a higher frequency of regular dental visits among residents of low-income households not covered by the Family Health Program (PSF) when compared to those living in low-income households covered by the PSF but without the implementation of Oral Health Teams (ESB)²⁵. The use of dental services in Brazil follows a pattern dictated by social inequalities. The highest proportion of use is observed among higher-income individuals, and the proportion of use of dental services is lower^{26,27} with age. Also, 50% of dental visits occurred with direct payment^{24,28}. However, the number of beneficiaries of exclusive dental plans has been on the rise in Brazil²⁹ due to the high cost of these services.

Among the limitations of this study, we emphasized that the PNS data used, referring to all residents of the household, were informed by one of the residents (proxy), which can generate errors in the answers and misinterpretations of the question or the respondent's lack of knowledge of details about the health insurance plan. In this research module, it is worth mentioning that IBGE uses a collection method that allows another person living in the household to answer the questionnaire for people who are absent at the interviewer's visit.

We conclude by saying that this study presented health insurance coverage according to several characteristics of the respondents. We identified no relevant increase in the percentage of people covered, and inequalities in this coverage persist. These results can help health managers plan health care in the SUS and reinforce the importance of the Unified Health System in reducing inequalities and providing public services to the low-income population and those residing in smaller or less developed municipalities and rural areas. We also identified that part of the population covered by health plans does not have coverage for hospitalization or delivery, suggesting that this population uses SUS when needing these services.

Collaborations

PBSJ was responsible for the paper's conception and design, analysis, interpretation of data, and writing of the paper. CLS, GND, SRS, and MMO contributed to data interpretation, writing, and the paper's critical review. WSA, LMVS, MLFPV, and EMM contributed to interpreting the data and the critical review of the paper.

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