

## Changes in the pattern of health services use in Brazil between 2013 and 2019

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**Abstract** *This study aimed to investigate changes in the health service use pattern based on information from the 2013 and 2019 National Health Surveys (PNS). The two outcomes, “Seeking health-related care in the past two weeks” and “Medical visit in the last twelve months”, were analyzed according to socioeconomic, geographic and health conditions characteristics. Multivariate Poisson regression models were used to investigate the factors associated with seeking care due to a health problem or prevention. The prevalence of chronic diseases increased from 15.0% to 22.5% between 2013 and 2019. The proportion of seeking care increased from 15.3 to 18.6%, and medical visits from 71.2% to 76.2%, ranging from 61.4 to 75.8% and 68.0 to 80.6% between the North and Southeast regions. There was no significant association of seeking care due to a health problem with per capita income, after controlling for the other covariates. We conclude by saying that, despite the expanded coverage of health service use, the persistent regional inequalities indicate unmet health needs among residents of the less developed regions. Health care models focused on prevention and health promotion are required.*

**Key words** *Health service use, Surveys, Health needs, Inequalities, Brazil*

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## Introduction

In Brazil, the national health system's organization is based on having a public system, responsible for providing free and universal care to any Brazilian in need, and supplementary health, defined by all private health care, performed or not through an agreement with a health insurance plan.

The SUS establishment by the 1988 Constitution was an essential change in the pattern of organization of health services in the country, strengthening primary health care and decentralizing services to increase accessibility to the health system and stepping-up health prevention and promotion actions<sup>1</sup>. Geographic targeting of care was established through family health teams in socially disadvantaged areas and population subgroups<sup>2</sup> with the implementation of the Family Health Program (PSF) in the 1990s.

In the mid-2000s, as the main gateway to the health system, primary health care started to coordinate care in the service network and implement the integration of the service network<sup>3</sup>. The current guidelines for the integration of care involve a regular demand service, the provision of primary care and health promotion services, and the guarantee of access to different care levels through referral mechanisms to ensure health-care continuity<sup>4</sup>.

Health regions and strategies were established to integrate different care levels as part of the decentralization process. The municipalities developed proposals to facilitate and streamline the implementation of new care models, with organizational criteria defined by the federal government and other municipal management criteria, imposing the need to evaluate the implantation and implementation of interventions and their population's health results<sup>5</sup>.

The research aimed at assessing health performance from the user population's perspective has been increasingly gaining relevance and was applied globally<sup>6-8</sup>. The user's perception has been overly valued and was an essential step for the planning of actions aimed at securing the quality of health care and subsidizing decisions meeting the needs of the population<sup>9</sup>. In Brazil, the periodic generation of population-based information has been an indispensable tool to monitor access to and use of health services and the health conditions of the population, allowing the evaluation of public health policies and providing subsidies for its improvement<sup>10-12</sup>.

In this sense, the search for health-related care and medical visits are positive indicators of

access to the health system insofar as they can significantly impact the health of the population, preventing the occurrence of diseases, reducing morbimortality, and increasing healthy life expectancy<sup>13</sup>. Additionally, studies on the use of health services can contribute to care organization, facilitating the establishment of inequalities in coverage levels according to sociodemographic features and place of residence and identifying the most vulnerable population groups<sup>14</sup>.

This study aimed to investigate the profile of health services utilization in 2019 in Brazil and analyze its trend compared to 2013, using data from the National Health Survey (PNS). Demographic and socioeconomic factors and care need indicators are considered in the analysis. Regional and social inequalities in the use of health services are compared using data from the two editions of the PNS.

## Methods

The National Health Survey is a household-based and a nationwide survey carried out by the Ministry of Health in partnership with the Brazilian Institute of Geography and Statistics (IBGE) in 2013 and 2019. The surveyed population includes Brazilian permanent dwellers of private households, except those located in special census tracts (barracks, military bases, halls of residence, settlements, boats, penitentiaries, penal colonies, prisons, jails, asylums, orphanages, convents, and hospitals) and in indigenous lands.

The PNS sample is a subsample of IBGE's Master Sample of the Integrated Household Survey System (SIPD), which consists of a set of units from areas selected to meet the various SIPD surveys, following four-criteria stratification: administrative, according to the administrative division of Brazil (Federation Units, capitals, metropolitan regions); geographic (districts and subdistricts of large municipalities); urban/rural situation of the area units; statistical, to obtain more accurate estimates<sup>15</sup>.

The PNS employed a three-stage cluster sampling plan, stratifying primary sampling units (PSU). In the first stage, the selection of primary sampling units (census tracts or tract composition) was carried out by simple random sampling, with the same stratification as the Master Sample. In the second stage, a fixed number of permanent private households was randomly selected in each PSU selected in the first stage from the National Register of Addresses for Statistical

Purposes (CNEFE). In the third stage, a resident (aged 18 or older in 2013 and aged 15 or older in 2019) was selected within each household in the sample, with equiprobability, from a list of eligible residents built at the time of the interview, to answer the individual interview<sup>15</sup>.

The National Research Ethics Commission (CONEP) approved the 2013 PNS in July 2013 under opinion N° 328.159, and the 2019 PNS in August 2019 under opinion N° 3.529.376.

The PNS questionnaire is divided into three parts: the household, all household residents, and the individual. Home-based questionnaires and for all household residents are answered by a resident of the household who knows how to inform about the socioeconomic and health status of all residents. A selected resident answers the individual questionnaire with equiprobability among all adult household residents. The 2013 PNS included residents aged 18 or over to answer the individual interview, while residents aged 15 or over were included in the 2019 PNS.

The IBGE was responsible for the fieldwork of the two editions of the PNS. In 2013, at the end of fieldwork, 69,994 households were occupied, and 64,348 household interviews were held. In 2019, 108,525 households were visited, and 94,114 interviews were conducted. The non-response rates were 8.1% and 6.4%, respectively.

The expansion factors were calculated by the inverse of the selection probability product at each stage, including a correction factor for the losses. A calibration process based on population projections for Brazil and Federation Units was carried out after weighing the bases by natural expansion factors. IBGE recalibrated the expansion factors of the 2013 PNS<sup>16</sup> to allow comparisons between the two editions of the PNS.

The construction of the 2019 PNS questionnaire followed the logic of providing a comparison with the 2013 PNS to monitor health indicators that are space-time<sup>17</sup> monitored. In this study, information from the questionnaire of all household residents regarding the demand and use of health services was analyzed and compared.

Two outcomes were considered. The first referred to the “Seeking health-related care in the last two weeks before the survey”, based on the following question: “In the last two weeks, did you search for a place, service, or health professional for care related to your health?” The reasons for seeking were also considered, and the indicator was broken down into two others: “Seeking care due to illness or health prob-

lem” and “Seeking preventive care”. The second referred to the “Medical visit in the last twelve months before the survey”, which was based on the following question: “When was the last time that you visited a doctor?” and individuals with at least one medical visit in the last 12 months before the survey were considered.

Outcomes were analyzed according to demographic indicators (gender, ethnicity/skin color, age range), regions of residence, and urban/rural situation in the residence tract. The analysis also included classes of per capita income concerning minimum wage (MW) and having health insurance.

Health care need indicators were also considered, established by the following variables: health status assessment (good, fair, poor); having a diagnosis of a chronic, physical or mental illness, or long-term illness with a duration of more than six months (no, yes, without limitations on usual activities, and yes, but with limitations on usual activities); and health problem in the last two weeks, based on the question “In the last two weeks, how many days did you fail to perform your usual activities, due to your health?”

Additionally, in the analysis, the indicator “Having a usual source of care” was considered based on the following question: “Do you usually look for the same place, same doctor, or same health service when you need health care?” If so, the types of a usual source of care were categorized as: primary care unit (UBS); emergency care unit (UPA); another public service; private office; private emergency care; other.

The statistical analysis consisted of comparing the distributions of the individuals surveyed in 2013 and 2019 according to sociodemographic, geographic, and health conditions factors by the estimates of the proportions and respective 95% confidence intervals in each category of the variables considered in the study.

In order to verify possible changes in health service utilization indicators between 2013 and 2019, the outcomes “Demand for health-related care in the last two weeks” and “Use of medical visit in the last year” were analyzed according to sociodemographic, geographic, and health conditions factors, estimating the prevalence and respective 95% confidence intervals for all categories of each study variable. Student’s t-test of independent samples was used considering significant differences at the 1% level to compare prevalence. Borderline differences were considered when p-values were close to 1% (descriptive level of significance of the test).

Considering as response variables “Seeking care due to illness or health problem” and “Seeking preventive care”, and “Medical visit in the last twelve months before the research”, multivariate Poisson regression models were used to identify the factors most associated with outcomes, with PNS data from 2013 and 2019, among individuals aged 30 years or older.

First, we used covariates age, gender, regions of residence, urban/rural situation, having a usual source of care, and per capita income. A logarithmic transformation was adopted to control the per capita income variance. Subsequently, the per capita income variable was replaced by having a health insurance plan. Due to the collinearity between per capita income and having a health insurance plan, the two covariates were used separately in the Poisson regression models. Prevalence ratios were estimated, and significance tests were performed at the 1% level. The sampling design of the two PNS editions was considered in the data’s statistical analysis, taking into account the sample weights, and the conglomeration effect. We used Software for Statistics and Data Science (StataCorp LP, CollegeStation, Texas, United States), version 14.0, module “survey”.

## Results

In 2013, 205,546 people participated in the PNS, 48.1% male and 51.9% female. In 2019, 279,382 individuals participated, 47.8% men and 52.2% women. Comparing the distributions by age group in 2013 and 2019, we can see the Brazilian population’s aging: in 6 years, the percentage of older adults increased from 13.2% to 16.4%. A significant increase in the percentage of self-declared black people was observed. No statistically significant differences were noted between 2013 and 2019 regarding the distribution by per capita income class. Also, comparing distributions by region of residence and urban/rural situation did not show statistically significant differences (Table 1).

Concerning the health conditions variables, significant differences were found for two of the three indicators considered in the study between 2013 and 2019: the percentage of people with a health problem in the last two weeks increased from 7.0 to 8.1%; the proportion of people diagnosed with a chronic disease with no limitations to perform their usual activities increased from 8.1 to 16.2%, and those with chronic disease with limitations hiked from 6.9 to 15.3%. Bor-

derline differences were found for health status assessment: the regular evaluation proportion increased from 21.6 to 22.3% and poor assessment from 4.3 to 4.7% (Table 1).

No significant differences were found regarding having health insurance, with proportions ranging from 27.9% in 2013 to 28.5% in 2019. Likewise, the percentages of people with a usual care source when they need it did not vary significantly (77.8% in 2013, and 76.5%, in 2019). As for the type of public service as the usual source of care, while UBS proportions remained similar, at 47.8% and 46.8%, in 2013 and 2019, respectively, an apparent increase was observed in using UPAs, from 4.1% to 14.1%. A significant increase in private practice was noted in the private sector, from 20.2 to 22.9% (Table 1).

Table 2 shows the differences in the proportions of people who sought health-related care in the last two weeks before the survey, according to the study’s indicators. Between 2013 and 2019, the percentage of demand for care increased from 15.3 to 18.6%: it increased from 11.5 to 14.7% due to illness or health problem, and from 1.9 to 3.7% for preventive care. The largest relative increase was for preventive care.

The analysis of the demand for health-related care in the last two weeks by age group shows a higher prevalence in extreme groups, from 0-4 years and 60 years or more, both in 2013 and in 2019, and the most significant growth occurred among children under five years old (3.1%). The comparison of prevalence by gender shows greater demand for care among women, but significant increases for both genders, between 2013 and 2019. Regarding ethnicity/skin color, while white individuals are more prevalent, growth was more pronounced for black people, exceeding four percentage points in the period (Table 2).

The region of residence analysis points to the substantial regional inequalities in the health care demand in the past two weeks. In 2013, the prevalence ranged from 10.0% in the North Region to 17.9% in the South Region, and in 2019, from 13.7% in the North Region to 20.9% in the Southeast Region. As for the urban/rural situation, the most significant increase in prevalence occurred among residents of urban areas, escalating inequalities (Table 2).

While significant increases were observed in the prevalence of seeking health care in all per capita income classes in the period studied, income inequalities remain very pronounced. In 2013, the percentage of people who sought health care ranged from 12.8%, among those with the

**Table 1.** Proportional distribution (%) of the population according to demographic and socioeconomic characteristics, region of residence, indicators of health conditions, and usual source of care. Brazil, National Health Survey, 2013 and 2019.

Variables	Category	2013		2019	
		%	95% CI	%	95% CI
Age group	0-4	6.4	6.2-6.5	6.1	6.0-6.3
	5-14	15.4	15.1-15.7	13.5	13.3-13.8
	15-29	24.7	24.3-25.0	21.7	21.4-22.0
	30-44	22.3	22.0-22.6	22.6	22.3-22.9
	45-59	18.1	17.8-18.4	19.6	19.3-19.9
	60+	13.2	12.8-13.5	16.4	16.0-16.8
Gender	M	48.1	47.9-48.4	47.8	47.6-48.0
	F	51.9	51.6-52.1	52.2	52.0-52.4
Ethnicity/skin color	White	45.9	45.2-46.6	43.4	42.8-44.1
	Black	8.6	8.2-9.0	10.4	10.1-10.7
	Brown	44.2	43.6-44.9	44.9	44.3-45.5
	Other	1.2	1.1-1.3	1.3	1.1-1.4
Region of residence	North	8.4	8.1-8.6	8.6	8.3-9.0
	Northeast	27.6	27.1-28.1	27.2	26.6-27.8
	Southeast	42.2	41.6-42.9	42.2	41.3-43.0
	South	14.3	13.9-14.8	14.3	13.9-14.7
	Center-West	7.5	7.3-7.7	7.7	7.4-8.0
Situation	Urban	85.2	84.7-85.7	85.4	85.0-85.8
	Rural	14.8	14.3-15.3	14.6	14.2-15.0
Per capita income	Up to ½ MW	26.2	25.5-27.0	26.5	25.9-27.1
	½ to 1 MW	29.9	29.1-30.6	29.2	28.6-29.8
	1 to 2 MW	25.8	25.1-26.4	25.9	25.4-26.4
	2 to 3 MW	8.0	7.6-8.4	8.2	7.9-8.5
	3 MW and over	10.1	9.5-10.8	10.2	9.6-10.7
Health insurance plan	Yes	27.9	27.1-28.8	28.5	27.8-29.2
Health status	Good	74.1	73.6-74.6	73.0	72.6-73.4
	Fair	21.6	21.1-22.0	22.3	22.0-22.7
	Poor	4.3	4.2-4.5	4.7	4.5-4.8
Health problem in the last two weeks	Yes	7.0	6.8-7.2	8.1	7.9-8.3
Chronic disease	No	85.0	84.6-85.4	68.5	68.1-68.9
	Yes, without limitations	8.1	7.8-8.5	16.2	15.9-16.5
	Yes, with limitations	6.9	6.7-7.1	15.3	15.0-15.6
Usual source of care	Yes	77.8	77.0-78.6	76.5	75.9-77.1
Source type (among those with a usual source of care)	UBS	47.8	46.7-49.0	46.8	45.8-47.9
	UPA	4.1	3.7-4.6	14.1	13.4-14.9
	Other public services	19.1	18.3-20.0	8.9	8.5-9.4
	Private clinic	20.2	19.4-21.1	22.9	22.1-23.6
	Private emergency care	4.9	4.4-5.4	4.4	4.0-4.8
	Other	3.9	3.6-4.2	2.8	2.6-3.1

worst per capita income, to 19.3%, among those with the highest income, with a difference of 6.5% between extreme classes. In 2019, the dif-

ference was even more pronounced, from 9.7%, with a gradient of 15.3 to 25.0%, in the worst to highest income classes. The prevalence increased

**Table 2.** Proportion (%) of people who had health-related care in the last two weeks before the survey, according to demographic and socioeconomic characteristics, region of residence, indicators of health conditions, and usual care source. Brazil, National Health Survey, 2013 and 2019.

Variables	Category	2013		2019	
		%	95% CI	%	95% CI
Total		15.3	15.0-15.7	18.6	18.3-19.0
Reason for use	Disease	11.5	11.2-11.8	14.7	14.4-15.0
	Prevention	1.9	1.8-2.0	3.7	3.5-3.9
Age group	0-4	18.6	17.5-19.7	21.7	20.6-22.8
	5-14	10.1	9.4-10.7	12.6	12.0-13.3
	15-29	10.9	10.4-11.4	13.3	12.8-13.8
	30-44	14.2	13.7-14.8	17.2	16.6-17.7
	45-59	19.0	18.2-19.7	22.0	21.3-22.6
	60+	24.9	24.0-25.9	27.5	26.8-28.3
Gender	M	11.8	11.5-12.2	14.8	14.5-15.1
	F	18.5	18.1-19.0	22.1	21.7-22.6
Ethnicity/skin color	White	17.0	16.4-17.5	20.2	19.7-20.7
	Black	14.7	13.7-15.7	19.1	18.3-19.9
	Brown	13.7	13.2-14.1	17.0	16.6-17.5
Region of residence	Other	17.5	15.0-20.2	18.9	15.6-22.7
	North	10.0	9.5-10.7	13.7	13.1-14.3
	Northeast	13.4	12.8-13.9	16.6	16.1-17.0
	Southeast	17.1	16.4-17.7	20.9	20.3-21.6
Situation	South <sup>1</sup>	17.9	17.0-18.9	19.8	19.1-20.5
	Center-West	13.7	13.1-14.4	16.7	16.0-17.4
	Urban	15.8	15.4-16.2	19.3	18.9-19.6
Per capita income	Rural	12.4	11.7-13.1	14.8	14.3-15.4
	Up to ½ MW	12.8	12.2-13.4	15.3	14.8-15.9
	½ to 1 MW	14.8	14.2-15.3	17.8	17.3-18.4
	1 to 2 MW	16.1	15.5-16.8	19.4	18.7-20.0
Health insurance plan	2 to 3 MW	18.0	16.8-20.5	21.8	20.7-22.9
	3 MW and over	19.3	18.2-20.5	25.0	24.1-25.9
	No	13.7	13.3-14.1	16.4	16.1-16.8
Health status	Yes	19.5	18.8-20.2	24.1	23.5-24.8
	Good	11.6	11.3-12.0	14.6	14.2-14.9
Health problem in the last two weeks	Fair	23.6	22.9-24.4	26.8	26.1-27.4
	Poor	36.9	35.2-38.7	43.2	41.7-44.6
Chronic noncommunicable disease	No	11.9	11.6-12.2	14.8	14.5-15.1
	Yes <sup>1</sup>	61.0	59.5-62.6	62.4	61.4-63.5
	No <sup>1</sup>	12.5	12.1-12.8	13.0	12.7-13.3
Usual source of care	Yes, without limitations <sup>1</sup>	25.2	23.9-26.5	24.5	23.7-25.2
	Yes, with limitations <sup>1</sup>	38.6	37.2-40.0	37.6	36.7-38.4
Usual source of care	No	12.1	11.5-12.7	15.8	15.2-16.3
	Yes	16.2	15.8-16.7	19.5	19.1-19.9

<sup>1</sup> Non-significant differences in the level of 1%.

by 4.6 percentage points among people with health insurance, and by 3.3 percentage points among people with a usual care source (Table 2).

The highest proportions of demand for health-related care in the last two weeks, both

in 2013 and in 2019, occurred among people in need of care: over 60% among those who had a health problem in the last two weeks, without significant differences between 2013 and 2019; about 25% and 38%, among those who have a

chronic disease without and with limitations in usual activities, also without significant differences in the period; and significantly increasing from 36.9 to 43.2%, between 2013 and 2019, among those with poor health status.

In Table 3, the proportions of people who saw a doctor in the last 12 months were analyzed according to the same indicators, comparing the results obtained in 2013 and 2019. The percentage of people who saw a doctor in the last year increased from 71.2 to 76.2%. The highest percentages of medical visits are for children under five years of age and older adults, reaching 90.9% and 86.9% in 2019, respectively. The lowest prevalence corresponds to children over five years old, adolescents, and young adults.

The differences by gender regarding doctors' use in the last year persisted but decreased in 2019, due to the more significant increase for males. As for differences by ethnicity/skin color, white individuals had significantly higher prevalence rates, although a lower ratio of inequalities between the prevalence of use of "whites" and "blacks" was observed in the period analyzed (Table 3).

The region of residence analysis shows large discrepancies in the proportion of people with a medical visit in the last 12 months, ranging from 61.4% in the North Region to 75.8% in the Southeast Region in 2013, and from 68.0% to 80.6% in 2019, respectively. The prevalence of medical visits is significantly higher among residents of urban areas, with differences of around ten percentage points in 2013 and nine percentage points in 2019 (Table 3). Inequalities by per capita income class are very pronounced, both in 2013 and in 2019. In the last year, the prevalence of medical visits ranged from 64.6 to 83.1% in 2013 and from 69.7 to 87.6% in 2019, reaching differences of approximately 18 percentage points between the lower and upper levels of the income classes.

Sharp and significant differences in having health insurance were also found in the two years analyzed: in 2013, the percentage of people who visited a doctor in the last year ranged from 65.9 to 84.8%, and from 71.6 to 87.6% in 2019, corresponding to variations of 19 and 16 percentage points, respectively, among those having and not having health insurance (Table 3).

Considering the health conditions indicators, the proportions of individuals who visited a doctor in the past year grow with increasing needs. According to the health status, the proportions ranged from 67.7 to 87.8% among people with a

good and bad evaluation in 2013, and from 73.0 to 91.8%, in 2019, respectively. The prevalence reached more than 92%, both in 2013 and 2019, considering the individuals with health problems in the last two weeks. In the last year, significant prevalence levels of medical visits are found among people diagnosed with some chronic disease, without and with limitations in usual activities of about 88 and 92%, respectively (Table 3).

Table 4 shows the results of the multivariate Poisson regression models for individuals aged 30 years or older. The following were found considering "Demand for care due to illness or health problem" as the answer variable both in 2013 and 2019: higher prevalence of demand with age; prevalence ratios 50% higher among women compared to men; 12% higher among residents of urban areas than those in rural areas; and about 25% higher among those with a usual source of care. The differences between the Southeast and South and North regions are significant and pronounced in the two years considered. The association of the per capita income variable with the outcome is not statistically significant after controlling for age, gender, urban/rural situation, the region of residence, and having a usual care source, both in 2013 and 2019.

Also, in Table 4, comparing the two outcomes, "seeking health-related care due to a health problem" with "seeking preventive care", shows higher prevalence ratios for gender and urban/rural situation, and with significant differences between Northeast and Southeast regions compared to the North. As for having a usual source of care, the prevalence ratios become insignificant, while the associations with per capita income are significant at the level of 1% (adjusted PR=1.21, in 2013, and adjusted PR=1.29, in 2019).

Table 5 shows the multivariate models' results, replacing the variable per capita income with having a health insurance plan. Regarding the demand for care due to illness or health problems, the associations with age, gender, urban/rural situation, having a usual source of care, and the differences by region were similar to those found in the models shown in Table 4. However, the prevalence of seeking care was significantly higher among people with a health insurance plan, with adjusted prevalence ratios of 1.11 and 1.16 in 2013 and 2019, respectively. Concerning seeking preventive care, the adjusted prevalence ratios are much higher, at 1.77 in 2013 and 2.10 in 2019; that is, individuals with health insurance have a prevalence twice as high of seeking preventive care.

**Table 3.** Proportion (%) of people who visited a doctor in the last 12 months before the survey according to demographic and socioeconomic characteristics, region of residence, indicators of health conditions, and usual care source. Brazil, National Health Survey, 2013 and 2019.

Variables	Category	2013		2019	
		%	95% CI	%	95% CI
Total		71.2	70.7-71.7	76.2	75.8-76.5
Age group	0-4	87.7	86.8-88.6	90.9	90.2-91.6
	5-14	66.5	65.5-67.5	72.7	71.7-73.6
	15-29	62.7	61.9-63.6	67.0	66.3-67.7
	30-44	69.0	68.2-69.8	73.1	72.5-73.7
	45-59	74.6	73.7-75.4	78.6	78.0-79.2
	60+	83.5	82.8-84.2	86.9	86.4-87.4
Gender	M	63.9	63.2-64.6	69.4	69.0-69.9
	F	78.0	77.5-78.5	82.3	82.0-82.7
Ethnicity/skin color	White	74.8	74.1-75.5	79.4	78.9-79.9
	Black	69.5	68.1-70.9	74.8	73.9-75.7
	Brown	67.7	67.1-68.4	73.3	72.8-73.8
	Other	73.9	71.0-76.6	78.7	75.0-82.0
Region of residence	North	61.4	59.9-62.8	68.0	66.9-69.0
	Northeast	66.3	65.5-67.1	71.9	71.3-72.5
	Southeast	75.8	74.8-76.8	80.6	79.9-81.2
	South	73.8	72.6-74.9	77.7	76.9-78.5
Situation	Center-West	69.5	68.4-70.6	73.7	72.6-74.8
	Urban	72.7	72.1-73.2	77.5	77.1-77.9
	Rural	62.8	61.5-64.0	68.6	67.8-69.4
Per capita income	Up to ½ MW	64.6	63.6-65.5	69.7	69.0-70.5
	½ to 1 MW	69.3	68.4-70.1	74.6	74.0-75.2
	1 to 2 MW	73.7	72.7-74.6	78.1	77.5-78.7
	2 to 3 MW	77.1	75.6-78.5	82.4	81.4-83.5
Health insurance plan	3 MW and over	83.1	82.1-84.1	87.6	86.8-88.4
	No	65.9	65.3-66.6	71.6	71.2-72.1
	Yes	84.8	84.0-85.5	87.6	87.1-88.1
Health status	Good	67.7	67.1-68.4	73.0	72.5-73.4
	Fair	79.9	79.1-80.6	83.3	82.8-83.8
	Poor	87.8	86.5-88.9	91.8	91.0-92.5
Health problem in the last two weeks	No	69.6	69.0-70.1	74.6	74.2-75.0
	Yes <sup>1</sup>	92.8	92.0-93.5	94.0	93.5-94.5
	No	67.8	67.2-68.4	69.7	69.2-70.2
Chronic disease	Yes, without limitations <sup>1</sup>	88.8	87.9-89.7	88.0	87.5-88.6
	Yes, with limitations <sup>1</sup>	92.4	91.6-93.1	92.6	92.2-93.0
	No	63.2	62.2-64.3	69.7	68.9-70.5
Usual source of care	Yes	73.5	72.9-74.1	78.2	77.8-78.6

<sup>1</sup> Non-significant differences in the level of 1%.

## Discussion

The results of this study show growth both in demand and in the use of health services, with increases in the proportion of individuals who sought health-related care in the two weeks before the survey and in the proportion of people who

visited a doctor in the last 12 months before the survey, when the 2019 PNS data are compared to those of the 2013 PNS. The benefits of expanding the coverage of the use of health services are duly recognized since the increased prevention, diagnosis, and early treatment of diseases can result in lower levels of premature mortality, increased



**Table 4.** Factors associated (considering per capita income as a covariate) with the demand for health-related care in the last two weeks before the survey according to the reason (health problem or prevention) among individuals aged 30 and over. Brazil, National Health Survey, 2013 and 2019.

Seeking care due to health problems					
Variables	Category	2013		2019	
		Adjusted PR	P-value	Adjusted PR	P-value
Age		1.02	<0.001	1.01	<0.001
Gender	M	1.00	-	1.00	-
	F	1.50	<0.001	1.46	<0.001
Region of residence	North	1.00	-	1.00	-
	Northeast	1.04	0.420	1.13	<0.001
	Southeast	1.37	<0.001	1.31	<0.001
	South	1.53	<0.001	1.28	<0.001
	Center-West	1.09	0.085	1.15	<0.001
Situation	Urban	1.12	0.002	1.12	<0.001
	Rural	1.00	-	1.00	-
Usual source of care	No	1.00	-	1.00	-
	Yes	1.28	<0.001	1.25	<0.001
Per capita income (logarithm)		0.98	0.081	1.00	0.608
Seeking preventive care					
Variables	Category	2013		2019	
		Adjusted PR	P-value	Adjusted PR	P-value
Age		1.00	0.866	1.01	0.001
Gender	M	1.00	-	1.00	-
	F	2.43	<0.001	1.68	<0.001
Region of residence	North	1.00	-	1.00	-
	Northeast	1.94	<0.001	1.22	0.004
	Southeast	1.73	<0.001	1.23	0.007
	South	1.68	0.001	1.14	0.101
	Center-West	1.45	0.013	1.01	0.861
Situation	Urban	1.23	0.088	1.46	<0.001
	Rural	1.00	-	1.00	-
Usual source of care	No	1.00	-	1.00	-
	Yes	1.18	0.083	1.07	0.214
Per capita income (logarithm)		1.21	<0.001	1.29	<0.001

life expectancy with quality, and reduction of unnecessary hospitalizations<sup>18</sup>. However, the interpretation of the increased use of health services is not immediate since it depends on several factors, such as the need, the sociodemographic characteristics, the provision of services, doctors' availability, health care financing, and the users' perception of the care provided<sup>19</sup>.

This study's findings show the aging of the Brazilian population between 2013 and 2019 and the increased prevalence of chronic non-communicable diseases, generating more health

care needs, limitations in activities of daily living, and more significant hardships in accessing health services among older adults<sup>20</sup>. Challenges related to minimizing access barriers among older adults, offering more services, and providing financing for preventing and treating chronic noncommunicable diseases have also been faced in other countries<sup>21-23</sup>.

It is interesting to note that there was a significant increase in the percentage of people who self-declared black between 2013 and 2019, corroborating results of the analysis of birth cohorts

**Table 5.** Factors associated (considering health insurance plan as a covariate) with the demand for health-related care in the last two weeks before the survey according to the reason (health problem or prevention) among individuals aged 30 and over. Brazil, National Health Survey, 2013 and 2019.

Seeking care due to health problems					
Variables	Category	2013		2019	
		Adjusted PR	P-value	Adjusted PR	P-value
Age		1.02	<0.001	1.01	<0.001
Gender	M	1.00	-	1.00	-
	F	1.50	<0.001	1.45	<0.001
Region of residence	North	1.00	-	1.00	-
	Northeast	1.04	0.447	1.13	<0.001
	Southeast	1.33	<0.001	1.28	<0.001
	South	1.48	<0.001	1.25	<0.001
	Center-West	1.07	0.212	1.13	0.001
Situation	Urban	1.09	0.031	1.00	-
	Rural	1.00	-	1.08	0.002
Usual source of care	No	1.00	-	1.00	-
	Yes	1.27	<0.001	1.24	<0.001
Health insurance plan	No	1.00	-	1.00	-
	Yes	1.11	0.001	1.16	<0.001
Seeking preventive care					
Variables	Category	2013		2019	
		Adjusted PR	P-value	Adjusted PR	P-value
Age		1.00	0.675	1.01	<0.001
Gender	M	1.00	-	1.00	-
	F	2.37	<0.001	1.62	<0.001
Region of residence	North	1.00	-	1.00	-
	Northeast	1.90	<0.001	1.20	0.007
	Southeast	1.67	<0.001	1.20	0.015
	South	1.68	0.001	1.17	0.056
	Center-West	1.43	0.015	1.04	0.645
Situation	Urban	1.18	0.164	1.37	<0.001
	Rural	1.00	-	1.00	-
Usual source of care	No	1.00	-	1.00	-
	Yes	1.15	0.145	1.04	0.487
Health insurance plan	No	1.00	-	1.00	-
	Yes	1.77	<0.001	2.10	<0.001

with data from the National Household Sample Survey, which show that cohorts become less “white” each year, especially after the 2000s. Variations in proportional distributions by ethnicity/skin color are attributed to changes in skin color self-identification during life, in a movement consistent with a higher percentage of declaring black skin color to the detriment of white<sup>24</sup>.

Regarding the differences in the use of health services by gender, higher percentages of seeking care and using a doctor were found among women. In general, studies that address morbidity and the use of health services report that women have a worse perception of health status and are more likely to use health care<sup>13</sup>. As for age, the highest frequencies of seeking health-related care occur

among those with the greatest need for care, children under five years of age, and older adults, corroborating findings from previous studies<sup>25,26</sup>.

Having a health problem continued to be the main reason for seeking services in 2013 and 2019. However, a more significant relative increase was observed in the proportion of preventive visits, suggesting that the aging of the Brazilian population and the increased need for health care possibly explain the greater use of health services, but other factors may have influenced the expanded search for care. The National Health Promotion Policy (PNPS) was implemented in the mid-2000s and provided greater availability of prevention services in PHC. A study conducted in 2014 showed that health promotion programs were in place in most PHC units<sup>27</sup>.

Having health insurance showed no significant increase between 2013 and 2019, with more than 70% of the population using the public system<sup>28</sup>. Having a usual source of care was a significant factor in seeking health care. The main source of care in the SUS was the primary network, with about 60% of the visits in public establishments carried out in the UBS in the two years considered, as already pointed out in a publication with data from the 2013 PNS<sup>29</sup>. However, significant growth was observed in the use of UPAs as a usual source of care from 2013 to 2019, showing that the expanded access was relevant for obtaining care, but it is not always adequate if it does not fully meet users' needs<sup>30</sup>. A study carried out in the U.S. shows that the provision of PHC through alternative services can overcome some barriers to access, but the lack of integration in the service network may result in users' dissatisfaction with the quality of the service provided<sup>31</sup>.

The proportion of individuals who visited a doctor in the last year increased considerably, by five percentage points, reaching 76% in 2019, a level similar to that of some developed countries<sup>32</sup>. The prevalence was higher among individuals with health insurance plans, reaching 88% in 2019, but the increase in doctors' use (5.7 percentage points) was higher among SUS users than in those with a health insurance plan (2.8 percentage points).

Having a health insurance plan can mitigate possible financial barriers when consuming services and lead to a timelier response with reduced waiting times for care and greater user satisfaction<sup>19</sup>. As discussed in other national papers, a health insurance plan increases the number of medical visits<sup>14,28</sup> and determines the greater use of preventive services<sup>33</sup>.

The analysis of multivariate models, both in 2013 and in 2019, showed that, in the situation of seeking care due to illness or health problem, no significant association was observed with the income level, after controlling for age, gender, regions of residence, urban/rural situation, and having a usual source of care. These results indicate that health services are accessible to individuals with a perception of their health problems, regardless of income level, and are particularly relevant in the context of reducing socioeconomic inequalities in health.

However, the multivariate analysis of the data from the two PNS editions related to the search for care by region of residence shows that regional inequalities are still pronounced, even controlling the effects of income and having a health insurance plan, regardless of the reason for the demand. Regional inequalities in the use of health services have been pointed out since 1998, with the highest prevalence in the Southeast and South and the lowest in the North<sup>34</sup>. Differentiated access to services and inequality in the geographic distribution of available resources have been considered the main explanatory mechanisms<sup>35,36</sup>.

This work shows the good performance of the national health system in expanding the coverage of health services, allowing to meet changes in the population's health needs, despite the chronic underfunding of the SUS and austerity policies after 2016. However, regional inequalities indicate that the health needs of the population living in less developed regions are not being met and should be the subject of further studies to support the planning of strategies aimed at overcoming inequalities. Care models more focused on prevention and health promotion are required<sup>37</sup> given the Brazilian population's aging, the increased obesity and prevalence of chronic diseases, and the urgency of adopting healthy behaviors by the Brazilian population.

One of the limitations of this work refers to the differences in the questionnaires of the two surveys. In 2019, the module on the evaluation of medical care was excluded, and it was not possible to know the reason for the medical visit in the last year (health problem or prevention), hindering a multivariate analysis similar to the one presented for the outcome "Seeking health care in the 15 days before the survey".

Another limitation is that health service use indicators are based on reported data, which are subject to memory bias. The questions in this PNS module can also be answered by the house-

hold's key informant, increasing the possibility of errors in measuring past events. Finally, due to the large sample size in the two editions of the PNS, small differences can be considered statistically significant, and the associations found in this work should be examined in the light of this limitation.

## Collaborations

CL Szwarcwald - participated in the conception and design, analysis and interpretation of data, and writing of the paper. SR Stopa, GN Damacena, WS Almeida, PRB Souza Júnior, MLFP Vieira, CA Pereira - participated in analyzing and interpreting data, writing, and critical review of the paper. LMV Sardinha, EM Macário - participated in the conception and design, writing, and critical review of the paper. All authors approved the final version of the manuscript.

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Article submitted 11/11/2020

Approved 01/12/2020

Final version submitted 03/12/2020

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Chief editors: Maria Cecília de Souza Minayo, Romeu Gomes, Antônio Augusto Moura da Silva