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The Family Health Strategy coverage in Brazil: what reveal the 2013 and 2019 National Health Surveys

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Abstract *This paper examines the evolution of Brazil's Family Health Strategy coverage from the findings of the 2013 and 2019 National Health Survey censuses. Indicators included Family Health Clinic coverage of residents and households, frequency of visits by Community Health Workers, and usual source of care, all stratified by rural and urban areas, Brazilian regions, states, education of the household head, and income quintile. In 2019, 60.0% of households were enrolled in a Family Health Clinic, and population coverage was 62.6%. Coverage was higher in rural than in urban areas in the Northeast and South regions. Between 2013 and 2019, coverage increased by 11.6%, while monthly health worker visits decreased. Coverage was highest among the most vulnerable population, as defined by the household head education level or by the family income. Availability of usual source of care was highest among those enrolled in a Family Health Clinic. The 2019 National Health Survey findings confirm that Brazil's Family Health Strategy continues to be an equitable policy and the main SUS' Primary Health Care model. However, recent changes in the national policy guidance, which are weakening the community approach and the priority given to the Family Health Strategy Program, may jeopardize those gains.*

Key words *Primary Health Care, Family Health Strategy, Health surveys, Health services coverage, Access*

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Introduction

Health systems leaded by primary health care (PHC), which are focused on people and communities, enabled to respond to the different health needs of population groups, have been associated with numerous positive health outcomes. Patients carrying one or more chronic conditions, for example, achieve better self-perception of health in countries of strong PHC structure, which supply continuity and comprehensive provision of services in public health systems[1].

In Brazil, positive health outcomes were achieved by means of the Family Health Strategy (FHS) expansion, a Brazilian community-oriented primary health care model. Among these outcomes, are the decrease in infant mortality, in hospitalizations for primary care sensitive conditions and in mortality from cardiovascular diseases[2,3,4]. FHS has been consolidated since the 2000s as the main PHC policy in the country, strongly grounded on the essential and derived attributes[5] and on the dimensions of social participation, intersectoriality and multidisciplinarity guided by the Unified Health System' (SUS) principles of universality, integrality and equity.

Data released from "2008 Domiciliary Survey Health Supplement-PNAD" already indicated that 50.9% of the Brazilian population was covered by FHS, which increased to 53.4% in 2013 according to the 2013 National Health Survey (PNS in Portuguese), matched up to the Ministry of Health administrative data estimates at the time[6]. Not less important was the increase in reporting a usual source of care by the vast majority of the population (78%), although differences across regions and level of education remained, according to the 2013 *PNS*[7] results. These inequalities reveal the contradictions and conditioning factors of the Brazilian health policy, limiting the consolidation of a universal public health system[8].

Monitoring the evolution of health service coverage in general, and particularly the PHC', is essential to identify some of the access barriers to health services and to contribute to inform health policies formulation. In this sense, it is mandatory to increase efforts towards instruments standardization, and improvement of data quality and availability so as to measure the coverage of a given intervention and access inequalities, also from a regional perspective that allows, among other aspects, comparability among countries[9].

The monitoring of indicators of health services access and use in Brazil has been carried out through population-based research such as the National Health Survey (*PNS* in Portuguese), which is an indispensable instrument for the evaluation and guidance of SUS improvement, especially in an environment of fierce and systematic attack on social policies.

After a period of fast FHS expansion experienced by the country in the years 2010, national policies were set up with the aim to induce and institutionalize multi-professional support, evaluation processes of access and quality, improvement of the infrastructure of Primary Health Care Units, and the provision of physicians for primary care, resulting in different outcomes according to its implementation characteristics[10]. As to the FHS, the 2019 *PNS* was the first national population-based survey conducted after the changes proposed by the 2017 National Primary Care Policy and by a set of laws and regulations creating a new type of financing, service portfolio and gathering of teams.

These measures will require close monitoring of the entire Brazilian society, as they include a strong induction towards relations between the State and private companies for the management and provision of services and as they weaken the spatial approach, community work, and comprehensive and multidisciplinary care[11].

The 2019 National Health Survey (*PNS*) collected data on access and use of health services by means of a national sample of households with the objective of identifying health conditions and lifestyles of the Brazilian population and of obtaining information on health care regarding access and use of services and care continuity and financing[12]. The aim of this paper is to analyze the FHS coverage evolution released from the National Health Surveys between the years 2013 and 2019, contextualizing its results in face of the recent changes in the national primary care policy carried out in the country.

Methodology

The paper analyzes the FHS coverage evolution between 2013 and 2019, estimated nationally for urban and rural areas and stratified by the national regions and federation units (UF).

The National Health Survey has as target the population living in private households in the rural and urban areas of Brazil, being carried out by means of a probabilistic sample of households. It results from the partnership between the Ministry of Health (MOH) and the Brazilian

Institute of Geography and Statistics (IBGE, in Portuguese) and is part of the IBGE' Integrated System of Household Surveys (ISHS). It adopts a subsample of the ISHS' Master Sample that respects the same stratification as the primary sampling units (PSU), being composed by one or more census sectors.

The 2019 National Health Survey sample size resulted in 8,036 PSU premises covering 108,525 households at a 20% non-response rate[12].

The National Health Survey sampling plan was divided into agglomerates respecting three stages. In the first stage, the PSU were selected, i.e., census sectors or set of sectors. The probability was proportional to each PSU size as defined by the number of permanent private households, while the selection for the PSU sample respected an equally proportional probability. The number of households to be interviewed per PSU ranged from 12 to 18 households and was inversely proportional to the number of households per state.

Thus, for the states of Maranhão (MA), Ceará (CE), Pernambuco (PE), Bahia (BA), Minas Gerais (MG), Rio de Janeiro (RJ), São Paulo (SP), Paraná (PR), Santa Catarina (SC) and Rio Grande do Sul (RS), twelve households were drawn per PSU. As for the states of Rondônia (RD), Acre (AC), Amazonas (AM), Pará (PA), Piauí (PI), Rio Grande do Norte (RN), Paraíba (PB), Alagoas (AL), Sergipe (SE), Espírito Santo (ES), Mato Grosso do Sul (MS), Mato Grosso (MT), Goiás (GO) and Federal District (DF), 15 households were drawn. Roraima (RO), Amapá (AP) and Tocantins (TO) selected 18 households per PSU. For each sampled household, a resident 15 years or older was selected. At all stages, the selection method employed was the simple random sample.

The questionnaire contained three parts: i) for data collection regarding the household and household visits caried out by endemic agents and Family Health teams; ii) for all household residents, focusing on the collection of socioeconomic, health and health service use information; and iii) for a selected resident, themes related to lifestyle, work, chronic diseases, violence, among others, were deepened[12,13].

As for the first two parts of the questionnaire, the information was provided by a resident considered able to provide information on behalf of the group of residents and on the household. The third part was answered by a randomly selected resident. The chosen collection technique was a personal computer-assisted interview. Data were collected between August 2019 and March 2020[12]. Information was obtained from 108,457 households.

Databases were provided by IBGE, which already included the weight calculation for both residents and households to be considered in a complex sample. To ensure the comparability of the results in the two editions of the research, IBGE recalculated the 2013 PNS expansion factors grounded on the revision of the Population Projection of the Federation Units per gender and age, for the period 2010-2060, by means of the Demographic Components method. That is, IBGE reweighted the weights adopted for the 2013 PNS sample expansion[12].

The researchers adopted IBM SPSS 22.0 software. The stratification and conglomeration effects were considered for the estimation of indicators and their precision measurements.

The following indicators were calculated for the two editions of the PNS:

. % of households enrolled in Family Health Units (FHU);

. % of residents living in households enrolled in FHU;

. % of households enrolled in the FHU per frequency of visit of the Community Health Worker (CHW);

. % of residents of enrolled and non-enrolled households that sought for a usual source of care;

.% of residents of enrolled and non-enrolled households that sought for a usual source of care, per type of service.

These indicators were stratified per rural or urban area, major regions, Federation units, schooling of the head of household, and per capita family income quintiles.

Prevalence was described and confidence intervals (95% CI) were estimated for 2019 PNS data. Pearson's adjusted chi-square test was applied at the significance level of 5% in order to compare the 2013 to the 2019 PNS results.

Results

PNS allows for a two-way analysis of the FHU coverage according to the proportion of households, as well as the proportion of population regarding the number of residents living in those households.

In 2019, 60.0% (95%CI:58.9-61.0) of the respondents reported that their household was enrolled in the Family Health Unit (FHU) and 11.0% (95%CI:10.5-11.6) of them could not answer this question (similar value to 2013: 10.6%).

Rural household coverage (77.0%) is higher than the urban one (57.3%). The regions with the highest household coverage are Northeast (71.1%) and South (64.8%). The Southeast has the lowest coverage (51.9%), although it comprises the highest number of enrolled households (16.6 million) (Table 1).

Based upon the number of residents in all households, the coverage increased to 62.6% (95% CI:61.5-63.7), a significant contingent of 131.2 million people. The differences observed between the regions as for household coverage are maintained for the denominator of residents. Five states have FHU population coverage greater than 80%: Piauí (90.7%), Tocantins (89.7%), Santa Catarina (87.2%), Paraíba (86.7%) and Sergipe (82.6%). Other eleven states have a coverage of more than 70% of their population. In numbers, São Paulo (21.9 million) and Minas Gerais (15.5 million) represent 28.5% of the total residents enrolled in FHU (Table 1).

Table 2 shows the population coverage evolution between 2013 and 2019. In the country as a whole, coverage increased by 6.5 percentage points (pp), from 56.1% in 2013 to 62.6% in 2019, corresponding to a 11.6% proportional increase in six years and the inclusion of 18.7 million residents in FHS.

The increases were also significant across all regions as in the number of urban and rural households. The largest increases in population coverage occurred in the South (9.1pp) and North (8.8pp) regions. However, when the analysis is carried out per Federation unit, varied behaviors are observed. Pará and Federal District experienced high growth percentages, around 16 pp. Rio de Janeiro, Paraná, São Paulo, Santa Catarina, Mato Grosso, Amapá, Paraíba, Pernambuco, Piauí, Sergipe and Ceará also showed significant growth. Variations were not significant in the states of Acre, Amazonas, Roraima, Maranhão, Rio Grande do Norte, Alagoas, Bahia, Minas Gerais, Espírito Santo, Rio Grande do Sul, Mato Grosso do Sul and Goiás. Tocantins, which showed a coverage greater than 90% in 2013, has experienced a slight reduction (Table 2).

When analyzing the percentage variation between the two surveys, the increases in coverage of the Federal District (112.3%), Rio de Janeiro (38.2%) and Pará (35.8%) became even more significant (Table 2 second last column).

One of the main elements characterizing FHS is the CHW household visit (HV) to the families under whose responsibility each agent is entitled, scheduled to be carried out routinely according to the needs and demands of families and territories. Considering the households enrolled for more than one year, it can be noted that CHW visits reduced from 2013 to 2019 (Table 3).

The proportion of households reporting monthly visits by the CHW in the previous year decreased from 47.2% (95% CI:45.7-48.8) in 2013 to 38.4% (95%CI:37.4-39.4) in 2019. Conversely, there was an increase in the proportion of those who never received an CHW household visit during the twelve months prior to the survey, from 17.7% (95% CI:16.6-18.8) in 2013 to 23.8% (95% CI:22.9-24.7) in 2019. The enrolled rural households receive CHW visits more frequently than the urban ones. In 2019, 66.3% of rural households received a monthly visit or every two months, while in urban households this percentage was 44.9% (Table 3).

It is noteworthy that, considering the evolution in numbers of households that received an CHW monthly or every two months, in the 2013 and 2019 PNS, there was an increase of 2.1 million households that began to receive monthly visits while 4.2 million households, although enrolled, did not receive any visits in 2019.

The reduction in the proportion of CHW monthly visits was observed for the country as a whole, in all major regions and in urban and rural areas. The reduction is not constant for all states. In 16 states, the reduction in monthly visits was significant (Table 3). Also, the 2019 increasing proportion of those who never received visits in the twelve months prior to the research was also significant in all regions and in 15 states. Eight states did not show any significant difference, either in monthly visits or in any visit during the period (AM, AP, MA, AL, SE, BA, SP, MT) (Table 3).

Nevertheless, 60% or more households of eight states (TO, MA, PB, AL, SC, MT, MS and GO) received CHW visits monthly or every two months in 2019.

It is noted that the state of Rio de Janeiro and the Federal District, although achieving the highest proportional increases of FHS coverage, did not receive CHW visits in half or more of their households. Yet, the percentage of households reporting monthly visits in 2019 was only 12.7% and 4.1%, respectively (Table 3). The states of AC, RO, ES, RJ, DF, PR and SC experienced the most significant reductions in receiving at least one household visit during the previous twelve months, an increase of more than ten percentage points in the answer of those who did not receive a visit in the previous twelve months (Table 3).

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Table 1. Proportion of households enrolled in family health units (FHU) and people living in enrolled households, Brazil, Major Regions, Federation Units and situation of urban and rural households, 2019.

	Households enrolled in the FHU (1.000)			Residents of households enrolled in the FHU (1.000)		
	%	CI 95%	n	%	CI 95%	n
Brazil	60.0	58.9-61.0	43,900	62.6	61.5-63.7	131,201
Urban	57.3	56.1-58.5	36,177	59.8	58.6-61.0	10/7,092
Rural	77.0	75.4-78.5	7,723	78.9	77.3-80.4	24,108
North	60.0	58.1-61.9	3,251	62.2	60.2-64.2	11,278
Rondônia	51.1	46.9-55.4	301	52.8	48.6-56.9	933
Acre	52.2	48.6-58.2	140	56.1	52.0-60.0	487
Amazonas	54.8	51.3-58.4	611	58.5	54.6-62.3	2,333
Roraima	52.0	47.4-56.1	79	54.0	48.4-58.3	289
Pará	61.3	57.8-64.7	1,569	63.7	60.0-67.2	5,455
Amapá	43.3	37.2-50.0	95	45.3	38.5-52.5	380
Tocantins	88.5	86.0-90.6	457	89.7	87.2-91.7	1,400
Northeast	71.1	70.0-72.3	13,535	73.3	72.1-74.5	41,751
Maranhão	65.8	63.5-68.1	1,389	68.4	65.9-70.8	4,817
Piauí	89.5	87.7-91.3	941	90.7	88.7-92.3	2,968
Ceará	72.4	70.2-74.6	2,170	73.8	71.6-75.9	6,751
Rio Grande do Norte	68.8	65.0-72.4	774	71.1	67.4-74.5	2,495
Paraíba	85.3	82.4-87.8	1,134	86.7	83.9-89.0	3,464
Pernambuco	70.6	67.4-73.7	2,324	73.4	70.0-76.5	6,974
Alagoas	65.4	62.7-68.4	710	67.8	64.8-70.6	2,259
Sergipe	80.3	77.9-82.9	637	82.6	79.8-65.0	1,900
Bahia	65.9	62.8=68.9	3,455	68.1	64.8-71.3	10,123
Southeast	51.9	49.7-54.0	16,594	54.6	52.3-56.8	48,230
Minas Gerais	70.3	66.3-74.0	5,398	73.0	68.9-76.8	15,456
Espírito Santo	60.5	56.7-64.1	859	61.7	57.7-65.5	2,479
Rio de Janeiro	45.5	42.8-48.2	2,948	48.5	45.6-51.5	8,380
São Paulo	45.0	41.5-48.6	7,389	47.7	44.0-51.5	21,914
South	64.8	62.7-66.9	7,201	67.6	65.4-69.7	20,232
Paraná	66.3	62.6-69.9	2,738	68.5	64.7-72.2	7,831
Santa Catarina	85.0	82.2-87.5	2,240	87.2	64.6-89.4	6,241
Rio Grande do Sul	51.2	47.4-55.0	2,223	54.2	50.3-58.0	6,160
Midwest	58.6	56.4-60.8	3,311	60.1	57.9-62.3	9,725
Mato Grosso do Sul	75.1	72.0-77.9	712	77.2	74.0-80.0	2,092
Mato Grosso	72.9	69.2-76.4	887	74.4	70.5-77.9	2,554
Goiás	58.6	54.5-72.6	1,432	59.3	55.2-63.3	4,168
Distrito Federal	27.0	23.6-30.6	280	30.2	26.5-34.2	911

Source: elaborated by the authors from the 2019 *PNS* database.

The analysis of FHU coverage per layers of per capita household income shows a tendency of higher coverage in the lower quintiles of per capita income. The coverage decreased as the income rose, following the 2013 pattern. In 2019, FHU coverage was 74.0% for the first quintile and 38.1% for the fifth quintile, the one with higher per capita family income (Table 4a).

The analysis of this same coverage per level of education of the head of household, which can also be considered a proxy for income, reveals a similar pattern: the lower the level of education, the higher the FHU coverage. The 2019 coverage for non-educated head of household was 76.9%, while for those with complete higher education, it was 41.7% (Table 4a).

Table 2. Proportional evolution (%) of people living in households enrolled in family health units. Brazil. Major Regions. Federation units and situation of the urban and rural household. 2013 and 2019. P values, Chi-square test for comparison between the two periods.

Brazil. Major Regions and Federation Units	2013	2019	Variation in number 2019-2013	Proportional variation 2019-2013	χ^2 p
Brazil*	56.1	62.6	6.5	11.6	0.0001
Urban*	53.3	59.8	6.5	12.3	<0.0001
Rural*	72.2	78.9	6.7	9.2	<0.0001
North*	53.4	62.2	8.8	16.5	0.0001
Rondônia	56.7	52.8	-3.9	-6.9	0.2538
Acre	51.7	56.1	4.4	8.6	0.2246
Amazonas	54.2	58.5	4.3	7.8	0.2311
Roraima	55.0	54.0	-1.0	-1.9	0.7620
Pará*	46.9	63.7	16.8	35.8	<0.0001
Amapá*	33.8	45.3	11.5	34.0	0.0149
Tocantins*	93.6	89.7	-3.9	-4.2	0.0088
Northeast*	68.1	73.3	5.2	7.7	<0.0001
Maranhão	66.4	68.4	2.0	2.9	0.5359
Piauí*	80.2	90.7	10.5	13.0	<0.0001
Ceará*	67.6	73.8	6.2	9.2	0.0152
Rio Grande do Norte	64.7	71.1	6.4	10.0	0.0546
Paraíba*	81.0	86.7	5.7	7.0	0.0254
Pernambuco*	66.8	73.4	6.6	9.9	0.0171
Alagoas	68.6	67.8	-0.8	-1.1	0.8476
Sergipe*	72.7	82.6	9.9	13.6	<0.0001
Bahia	63.9	68.1	4.2	6.6	0.2012
Southeast*	48.2	54.6	6.4	13.2	0.0006
Minas Gerais	72.2	73.0	0.8	1.2	0.7859
Espírito Santo	57.3	61.7	4.4	7.6	0.2903
Rio de Janeiro*	35.1	48.5	13.4	38.2	<0.0001
São Paulo*	41.2	47.7	6.5	15.7	0.0184
South*	58.5	67.6	9.1	15.6	0.0001
Paraná*	56.6	68.5	11.9	21.1	0.0017
Santa Catarina*	76.5	87.2	10.7	14.0	0.0003
Rio Grande do Sul	49.5	54.2	4.7	9.4	0.1997
Midwest*	54.5	60.1	5.6	10.3	0.0122
Mato Grosso do Sul	76.7	77.2	0.5	0.7	0.8317
Mato Grosso*	66.0	74.4	8.4	12.8	0.0160
Goiás	57.5	59.3	1.8	3.2	0.6363
Distrito Federal*	14.2	30.2	16.0	112.3	<0.0001

* $p<0.05$. Pearson adjusted chi-square test.

Source: elaborated by the authors from 2019 and 2013 PNS database.

Between 2013 and 2019, a coverage increase was observed for all education levels of the head of household and for all income quintiles, except for the fifth quintile (Table 4a). Noteworthy is the significant 32% coverage increase of households whose head had completed higher education, growing from 31.6% in 2013 to 41.7% in 2019, almost doubling from 7.4 million to 13.5 million residents covered (Table 4a).

In all regions of the country, the coverage is higher in the lower income strata, with emphasis to the highest coverage in the first quintile

Table 3. Proportion of households enrolled in family health units for more than one year who received *community health workers (CHW)* visits in the previous twelve months, as for the frequency. Brazil. Major Regions. Federation Units and situation of the urban and rural household. 2013 and 2019.

	monthly		every two months		2 to 4 times		once		never		χ^2 p
	%	%	%	%	%	%	%	%	%	%	Comparison of monthly visit
	2013	2019	2013	2019	2013	2019	2013	2019	2013	2019	
Brazil*	47.2	38.4	11.1	10.5	13.4	16.1	10.6	11.2	17.7	23.8	<0.0001**
Urban*	43.6	34.4	11.1	10.5	14.1	16.7	11.4	12.0	19.8	26.3	<0.0001**
Rural*	62.7	56.0	11.0	10.3	10.7	13.6	7.0	7.7	8.6	12.4	0.0002**
North*	49.6	38.7	14.9	12.2	13.1	17.5	11.6	12.7	10.8	19.0	<0.0001**
Rondônia*	53.8	37.9	12.7	10.1	13.8	15.5	12.1	12.4	7.5	24.1	0.0002**
Acre*	53.0	39.3	18.1	11.3	13.3	17.9	8.4	10.1	8.4	22.6	0.0006**
Amazonas	46.5	40.0	9.7	9.1	11.2	12.2	14.1	18.5	18.4	20.2	0.1208
Roraima*	36.2	22.6	15.1	12.9	20.8	25.8	15.1	16.1	13.2	21.5	0.0001**
Pará*	41.6	35.4	18.0	12.0	15.6	21.0	13.1	11.4	11.7	20.2	0.0959
Amapá	29.4	25.5	11.8	7.5	19.6	23.6	19.6	23.6	21.6	19.8	0.5764
Tocantins*	70.8	53.2	14.6	18.6	7.4	11.5	4.6	7.7	2.6	9.2	<0.0001**
Northeast*	50.4	42.6	12.1	11.7	14.7	18.8	9.5	10.4	13.4	16.4	<0.0001**
Maranhão	54.8	49.1	11.6	13.5	12.2	18.8	10.2	9.3	11.2	9.3	0.0792
Piauí*	53.3	39.8	14.2	11.1	11.9	20.6	12.1	11.4	8.6	17.1	0.0001**
Ceará*	49.4	41.0	10.9	8.9	15.4	17.6	10.1	10.7	14.2	21.8	0.0025**
Rio Grande do Norte	43.3	35.8	12.1	14.1	14.8	21.5	11.8	11.4	18.1	17.3	0.0414**
Paraíba*	61.4	52.6	13.3	10.1	11.4	15.3	8.5	11.0	5.4	11.2	0.0159**
Pernambuco	49.2	40.8	11.6	14.1	13.4	16.8	10.7	9.8	15.1	18.6	0.0052**
Alagoas	52.9	58.0	12.5	11.6	14.1	13.9	6.2	6.6	14.3	9.9	0.1556
Sergipe	42.6	37.9	14.3	10.5	17.1	22.3	9.6	9.2	16.6	20.2	0.1381
Bahia	47.4	39.0	11.7	11.6	18.0	21.4	7.8	11.6	15.1	16.4	0.0551
Southeast*	41.5	33.4	9.6	9.3	13.6	15.8	11.4	11.5	23.9	30.0	0.0001**
Minas Gerais	52.8	45.2	11.4	12.4	13.8	17.3	7.0	8.1	15.1	17.0	0.0449**
Espírito Santo*	55.1	45.5	10.9	9.3	11.0	12.6	9.7	8.1	13.1	24.5	0.0301**
Rio de Janeiro*	25.4	12.7	12.9	4.3	22.1	17.4	14.6	18.1	25.0	47.5	<0.0001**
São Paulo	35.0	31.0	7.0	8.9	11.3	14.4	14.4	11.9	32.3	33.8	0.1868
South*	48.2	37.7	9.7	8.2	12.4	13.1	11.9	12.3	17.8	28.6	<0.0001**
Paraná*	33.9	28.1	8.8	8.2	18.4	13.4	16.7	14.2	22.3	36.1	0.1305
Santa Catarina*	65.1	52.1	10.6	7.8	8.8	9.2	6.6	9.4	8.8	21.5	0.0004**
Rio Grande do Sul	47.8	34.2	9.8	8.8	9.4	16.7	11.7	13.1	21.3	27.2	0.0004**
Midwest*	58.3	46.8	13.7	14.4	9.6	11.4	7.5	9.6	10.8	17.8	<0.0001**
Mato Grosso do Sul*	62.0	54.3	15.9	13.6	9.7	11.2	5.5	10.0	6.6	10.9	0.0245**
Mato Grosso	53.8	50.7	13.2	13.3	6.9	9.7	8.2	8.1	17.8	18.3	0.5011
Goiás*	62.9	48.0	13.7	17.3	9.8	12.3	6.8	8.4	6.6	14.1	0.0003**
Distrito Federal*	9.1	4.1	4.7	4.1	24.7	13.4	24.7	21.2	36.7	57.2	0.0717

* p<0.05. Pearson adjusted chi-square test. Comparison between 2013 e 2019 for no visit, meaning significant increase in 2019.
** p<0.05. Pearson adjusted chi-square test. Comparison of the monthly visit frequency between 2013 e 2019, meaning significant reduction in 2019.

Source: elaborated by the authors from 2019 and 2013 PNS database.

showed by the Northeast region, which achieved 81.4% of residents covered. The South region showed more homogeneous rates and the highest coverage for the highest income quintile (52%), as well as the lowest variation of 19.7 percentage points between the first and fifth quintiles (from

71.8% to 52.0%). Conversely, the coverage variation of residents as to quintile income for the Northeast region was 43.2 points.

Monthly household visits are also more frequent for the lower-income population (Table 4b). The monthly visits were reduced for all income strata between 2013 and 2019, although the highest monthly visit frequency (44.4%) remained for households in the poorest first quintile. Similarly, the lowest frequency (26.5%) was addressed to the highest income fifth quintile. Consistently, the proportion of enrolled households that did not receive any visits in the previous year was lower for the lower income quintiles, that is, less than half for the first quintile when compared to the fifth quintile (Table 4b).

To know the availability of a usual source of care, the PNS asked whether the resident usually seeks for care in the same place, same physician or even in the same health service. The availability of a usual source of care is higher among FHU enrolled residents (78.7%; 95%CI:78.0-79.4) than among non-enrolled ones (72.5%; 95%CI:71.4-73.7) and among those who do not know the household enrollment status (95% CI:72.0-75.0). When compared to the 2013 data, a slight increase, from 78,7% to 80% was observed for enrolled residents who had a usual source of care (95%CI:79.0-81.0), and a reduction from 75.1% to 72.5% (p=0.0046) among those not enrolled (95%CI:73.9-76.3).

The three most frequent usual sources of care of enrolled residents are the (i) primary health care units (PHCU) – health centers or FHU – (56.1%); (ii) the private offices or private clinic or private hospital outpatient clinic (16.0%); and (iii) the public emergency care services, i.e., UPA (in Portuguese) or another type of 24-hour public emergency care or public hospital emergency room (13.3%) (Table 5). Among the population not enrolled, the usual source of care are the private offices (36.5%), followed by PHCU (28.1%) and public emergency care services (16.0%) (Table 5).

The usual source of care of residents living in enrolled households are public in its vast majority (78.8%), while among those not enrolled this proportion decreases to 52.2%. In 2013, these percentages were respectively 80.8% and 54.9% (Table 5).

Comparing the 2019 results to the 2013 ones, PHCU was mentioned as a usual source of care by 56.1% (55.1%-57.2%) of the residents enrolled in 2019, while this percentage was 58.5% (57.2%-59.9%) in 2013, a significant difference (p=0.0092). On the other hand, there is a significant increase from 9.9% to 13.3% (p<0.0001) for public emergency care services as a usual source of care among those enrolled, and from 12.9% to 16.0% (p=0.0005) among those not enrolled (Table 5).

Table 4a. Proportion and number of residents (per 1,000) of households enrolled in family health units, as per level of education of the head of household and per capita family income quintile. Brazil. 2013 and 2919 *PNS*. P values, Pearson adjusted chi-square test for comparison between years.

	2013			2019			χ^2
	%	CI 95%	n	%	CI 95%	n	p
Level of education of the head of household							
No education or <1[a]	68.1	65.9-70.3	13.592	76.9	75.1-78.6	11,253	<0.0001
Incomplete elementary school	64.2	62.5-65.8	47.573	71.9	70.6-73.1	49,512	<0.0001
Complete elementary school	58.4	56.3-60.4	16.505	64.5	62.7-66.1	19,505	<0.0001
Complete high school	49.9	48.2-51.6	27.184	58.9	57.4-60.5	3,751	<0.0001
Graduated	31.6	29.4-33.9	7.380	41.7	39.7-43.7	13,503	<0.0001
Quintiles of residents' per capita income							
1st quintile	67.2	65.3-69.0	26.837	74.0	72.6-75.3	38,674	<0.0001
2nd quintile	63.6	61.7-65.5	25.350	68.4	67.0-69.8	34,224	0.0002
3rd quintile	60.7	58.9-62.5	24.200	65.4	63.6-67.2	23,694	0.0008
4th quintile	54.1	52.1-56.1	21.573	58.3	56.5-60.2	21,701	0.0039
5th quintile	34.8	32.9-36.9	13.886	38.1	36.2-40.0	12,833	0.0268
Total of residents	56.1	54.8-57.3	111.883	62.6	61.5-63.7	131,201	

Source: elaborated by the authors from the 2013 and 2019 PNS database.

Table 4b. Proportion and number of households (per 1,000) enrolled in family health units, as per frequency of household CHW visits (monthly and none) and per capita family income quintile. Brazil. 2013 and 2019 *PNS* database.

CHW visits	2013			2019			χ^2
	%	CI 95%	N	%	CI 95%	n	p
CHW monthly visits during the twelve previous months*							
1st quintile	53.1	50.7-55.5	12,621	44.4	42.7-46.1	15,753	<0.0001
2nd quintile	51.4	48.9-53.8	10,680	39.3	37.7-40.9	12,003	<0.0001
3rd quintile	48.1	46.0-50.2	9,709	39.5	37.9-41.1	8,252	<0.0001
4th quintile	44.1	41.7-46.7	8,043	36.2	34.4-38.1	7,137	<0.0001
5th quintile	38.1	35.3-40.9	4,359	26.5	24.6-28.5	3,058	<0.0001
No CHW visit during the previous twelve months*							
1st quintile	12.4	11.0-14.0	2.741	18.1	16.7-19.5	6,231	<0.0001
2nd quintile	14.2	12.7-15.8	3.165	21.1	19.8-22.5	6,553	<0.0001
3rd quintile	17.3	15.6-19.1	3.721	21.9	20.6-23.3	4,993	0.0001
4th quintile	20.2	18.3-22.3	3.892	27.2	25.5-28.9	5,404	<0.0001
5th quintile	25.6	23.1-28.2	3.145	37.9	35.7-40.1	4,398	<0.0001
Total of households	53.3	52.1-54.5	34.581	60.0	58.9-61.0	43,900	

Note: In 2013, the average per capita family income for the quintiles were: R$169.25 (1); R$384.74 (2); R$617.51 (3); R$976.10 (4); R$3.035.79 (5). In 2019: R$275.91 (1); R$663.14 (2); R$1,042.72 (3); R$1,613.04 (4) and R$4.909.72 (5). * In the households enrolled for more than twelve months.

Source: elaborated by the authors from 2019 and 2013 PNS database. X^2 Pearson adjusted chi-Square test.

Table 5. Usual source of care for residents (per 1,000) as per enrollment in *FHU* and types of services used. Brazil, 2013 and 2019

Type of service used	2013						2019					
	Enrolled in FHU			Non-enrolled in FHU			Enrolled in FHU			Non-enrolled in FHU		
	%	CI 95	n	%	CI 95	n	%	CI 95	n	%	CI 95	N
PHCU, health center or FHU	58.5	57.2-59.9	52,419	32.0	30.2-33.8	15,956	56.1	55.1-57.2	58,000	28.1	26.3-30.0	11,270
Private office[a]	13.2	12.5-14.0	11,811	32.9	31.2-34.6	16,415	16.0	15.4-16.7	16,562	36.5	34.7-38.3	14,626
Public emergency care[b]	9.9	9.0-10.9	8,861	12.9	11.8-14.0	6,413	13.3	12.4-14.2	13,741	16.0	14.7-17.4	6,404
Public hospital outpatient clinic	10.6	9.8-11.4	9,448	8.3	7.5-9.1	4,139	6.8	6.4-7.3	7,047	5.2	4.4-6.1	2,077
Private emergency care or private emergency room	2.8	2.4-3.2	2,470	8.6	7.7-9.6	4,282	2.6	2.3-2.9	2,637	8.0	7.0-9.3	3,220
Pharmacy	2.9	2.6-3.3	2,619	2.9	2.5-3.3	1,429	2.2	1.9-2.4	2,227	2.6	2.2-3.1	1,047
Polyclinic or public specialty center	1.8	1.5-2.1	1,580	1.8	1.4-2.2	887	2.6	2.2-3.0	2,640	2.9	2.4-3.5	1,172
Home care	0.1	0.0-0.2	124	0.4	0.2-0.7	186	0.2	0.1-0.2	161	0.1	0.1-0.2	56
Other service	0.2	0.2-0.3	219	0.4	0.3-0.6	218	0.3	0.2-0.4	289	0.5	0.3-0.8	206

[a] Also includes private clinic and private hospital outpatient clinic. [b] Includes: UPA (Emergency care unit), another type of 24-hour public emergency care, emergency room or public hospital emergency room.

Source: elaborated by the authors from the 2013 and 2019 PNS database.

Discussion

The 2019 PNS results confirm that FHS is the SUS' PHC predominant modality, reaching 62.6% of Brazilians in 2019. The Northeast and South regions coverage percentages are the highest, maintaining the 2013 PNS standard. However, most of the Brazilians enrolled in a FHU live in the Southeast region, mirroring the national population distribution pattern.

Coverage is higher among the most vulnerable population, whether considering the head of the household level of education or the per capita family income. Coverage is more significant in rural areas where, in general, is the population with worse living conditions and greater difficulties in accessing health services. In those localities, private services are residual, and SUS is responsible for health care. In this sense, FHS reaches more intensely the most vulnerable populations.

There is a clear speeding up in the expansion of FHS population coverage between 2013 and 2019 when compared to the period 2008-2013. In the six years between 2013 and 2019, coverage increased by 6.5 percentage points, meaning an average increase of 1.1 point per year, which allowed the inclusion of an additional 18.7 million people. Between 2008 and 2013, coverage had increased by 2.5 percentage points, from 50.9% to 53.4%6, equivalent to 0.5 point per year.

The increase in speed of the FHS expansion may be related to the success of the provision of physicians by means of the More Doctors Program (MDP) established by Dilma's government in 2013, which contributed to the implementation of more 8,800 FHS teams between September 2013 (34,892), when the first arrival of MDP physicians to municipalities took place, and October 2018 (43,735), the last month of Cuban physicians' participation, according to Egestor-AB[14]. The Program was predominantly implemented in municipalities of greater vulnerability or metropolitan peripheries, places where several studies showed the improvement of coverage and care and the reduction of physicians' shortage due to the MDP[15,16,17].

Despite the fact that the insertion of MDP physicians in existing teams which previously had an intermittent presence of these professionals has reduced turnover, another 7,000 new teams were created[10] between 2013 and 2015, contributing greatly to the expansion of FHS coverage, since MDP physicians could only be inserted in FHS teams. When the MDP was dismantled in 2019, with the proposal to replace it for Physicians for Brazil, to be implemented by a private agency (ADAPS)[18], it may be assumed that this positive evolution will be interrupted.

It should also be noted that, in 2019, 11% of the respondents remained unsure whether their households were enrolled or not, a similar proportion to the 2013 research. That doubt suggests little knowledge of the respondent about the Family Health Strategy and the need for better communication.

The 2019 PNS results reinforce that Family Health remains an equitable policy to the extent that coverage is higher among the poorest, reducing socioeconomic differences in the access to PHC services[19]. Results are robust also in relation to income as to education, both understood as proxy for vulnerability. The FHS effects in reducing inequality are described in a rich bibliography under the most varied dimensions, among them racial inequities in mortality due to preventable causes[20].

One of the most noticeable results is the decrease in the proportion of the enrolled population receiving monthly CHW visits despite the increase of that population. That reduction may result from several factors. On one hand, there was a marked expansion of coverage in the Federal District and in Rio de Janeiro, especially its capital, where the care model, somewhat legitimized by 2017 National PHC Policy, has prioritized the individual centered care, with a sharp reduction in the number of CHW[21,22] On the other hand, the states of higher coverage experienced the expansion through middle-class housing territories, carrying various difficulties for the household visit such as the absence of residents during working hours, buildings and condominiums that hinder the CHW entrance, resistance of residents to the visit, among others.

Other possible related factors are the changes observed in the CHW responsibilities, due to the intensification of activities in the PHCU premises, in the team embracement, filling out of Bolsa Família (conditional income transfer for vulnerable families) forms and information systems, or even outside the PHCU for the delivery of exam indication and specialized scheduled consultations forms. These activities require extra work spent in bureaucratized activities, such as of administrative or support nature, to the detriment of time that should be addressed to household visits and field work[23,24].

Morosini and Fonseca[24] warn us of the gradual change in the CHW field work, which is shifting from the territorial production of commu-

nity diagnosis, complex in scope and filled with community action, to operational tasks such as just data inputting and record updating. Moreover, real possibilities of PHC privatization and pricing based on ADAPS and service portfolio[25] may additionally weaken the FHS community dimension, observed previously in the management privatization contexts via Social Healthcare Organizations (OSS)[22].

Problems in the organization of the CHW work process were also revealed in a cross-sectional study conducted by Nunes et al in 2015. They employed a representative national sample, concluding that only 67% of CHW were centrally committed to visiting certain groups, based on individual needs, and performing monthly household visits[26].

It is recognized that the FHS care model centered on community-oriented health surveillance faces implementation limits. Nevertheless, potential negative effects of the care model reorientation, driven by the 2017 Primary Care National Policy and a series of initiatives adopted from 2019 forth, may lead to the imbalance between individual and collective care, reinforcing emergency care.

At the same time that the 2017 PCNP allowed the creation of FHS teams with only one CHW or of primary care teams without CHW, ordinance 2979 of 2019 equated the financing of primary care teams and FH teams and abolished the FHS priority, which weakened the SUS' PHC community and collective dimensions. The continuity of these policies is an indication of an even wider reduction in CHW household visits over time.

Access to health care is a complex and multidimensional concept[27]. Having a usual source of care is a classic indicator of access and availability of services. It has been shown, for a long time now, that people who have access to a usual source of care receive more preventive and therapeutic services for chronic diseases[28,29,30]. As for the PNS, this indicator is investigated as the availability of a usual source of care.

One of the PHC features is to be the first point of service, i.e., the system gateway. In order to fulfill this feature and provide longitudinal care is that the PHCU be chosen as the usual source of care. Since 1998, with the implementation of the then new financing modality of per capita fund-to-fund transfers that expanded the PHC capillarity, population-based researches (PNAD-Health and PNS) have shown improvements in this indicator, revealing that an increasing proportion of residents gained access to a usual source of care[31].

Although PHCU remains the usual source of care for 69 million enrolled and non-enrolled residents, there is an increase in the population that seeks public emergency services, which may indicate a competition between the primary care model and the emergency care units (UPA), as first contact service. At the end of the 2000 decade, the country went through a federal induction for the implementation of emergency care units (UPA), within the scope of the national emergency care policy. As result, those units expanded under municipal management, although not succeeding in the health care regions integration, merely occupying the quantitative and qualitative shortfalls of PHC and hospital care[32,33].

Final comments

The 2019 PNS results reaffirm that FHS remains the main SUS' PHC model, providing successful results over time, being community and equity oriented. The guidance of recent national policy has nurtured a significant rupture in relation to the incentive priority towards FHS, without, however, delivering answers and proposals to historical problems concerning PHC qualification. The possibility of not counting with CHW in the team should affect one of the care model pillars, the one that characterizes FHS in its community and health promotion components, grounded on the social determination conception of the health-disease process and the expanded clinic[25].

In this context, maintaining population-based research such as the PNS is essential for monitoring and improving health policy in the country, to foster international comparisons and, above all, to closely monitor the right to integral, public and universal health by all actors involved in its defense.

Finally, it is essential to underline the importance and potential of the Family Health Strategy capillarity, covering 131 million Brazilians by means of its territorial responsibility. It is also of capital importance to emphasize its community orientation in coping with the Covid-19 pandemic by means of health surveillance with detection, notification, screening and follow-up of cases and contacts in home isolation; communication and health education; care of mild and moderate cases; social support for vulnerable populations and risk groups in conjunction with local organizations and leaders; and in the care[34] permanence of the huge population that relies on PHCU as its usual source of care.

Collaborations

L Giovanella and A Bousquat worked on the design, methodology, data analysis and final writing; PF Almeida worked on the analysis, discussion and final writing; S Schenkman worked on the methodology and data analysis; LMV Sardinha and MLFP Vieira worked on the conception, management and development of the research and on the final review of the paper.

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