Acta Bioethica 2024; 30(1): 107-116

EFFICIENCY, PLANNING AND GOOD MANAGEMENT, DETERMINING FACTORS FOR A GREATER EQUITY ON HEALTH CARE EXPENSES: THE EXPERIENCE FROM THE PROGRAM FAMILY HEALTH STRATEGY IN BRAZIL

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Abstract: The present work presents as a research problem the importance of efficiency, planning, and principles of good management aiming at capillarity and equity to generate greater access and quality of services. The objective of this article was to identify the expansion of the Family Health Strategy in Brazil between 2007 and 2020, and which variables may explain this evolution. This is a descriptive, ecological research, developed between 2007 and 2020 in Brazil; its variable of interest was the estimated population coverage of this strategy (%). An increase in the coverage of the Family Health Strategy was observed in all regions of Brazil between 2007 and 2020, especially in the Northeast region. At the state level, this coverage showed a significant positive relationship with the following variables: towns with fewer than 40,000 inhabitants and monthly income inferior to half a minimum salary. The Brazilian version of the Family Health Strategy seeks inspiration from the best and most successful health models to achieve high performance and efficiency to provide equity and access to health services.

Keywords: strategy of family health, equity, management, unified health system, public management

Eficiencia, planificación y buena gestión, factores determinantes para una mayor equidad en los gastos sanitarios: la experiencia del programa estrategia de salud familiar en Brasil

Resumen: El presente trabajo aborda como problema de investigación la importancia de la eficiencia, la planificación y los principios de buena gestión que apuntan a la capilaridad y la equidad para generar un mayor acceso y calidad de los servicios. El objetivo de este artículo fue identificar la expansión de la Estrategia Salud de la Familia en Brasil entre 2007 y 2020 y las variables que pueden explicar esta evolución. Se trata de una investigación descriptiva y ecológica, desarrollada entre 2007 y 2020 en Brasil; su variable de interés fue la cobertura demográfica estimada de esta estrategia (%). Se observó un aumento de la cobertura de la Estrategia Salud de la Familia en todas las regiones de Brasil entre 2007 y 2020, especialmente en la región noreste. A nivel estatal, esta cobertura mostró una relación positiva significativa con las siguientes variables: municipios con menos de 40.000 habitantes e ingresos mensuales inferiores a medio salario mínimo. La versión brasileña de la Estrategia de Salud de la Familia busca su inspiración en los mejores y más exitosos modelos de salud para alcanzar un alto rendimiento y eficiencia para proporcionar equidad y acceso a los servicios de salud.

Palabras clave: estrategia de salud familiar, equidad, gestión, sistema sanitario unificado, gestión pública

Eficiência, planejamento e boa gestão, fatores determinantespara uma maior eqüidade nos gastos de cuidados à saúde: a experiência do programa Estratégia de Saúde da Família no Brasil

Resumo: O presente trabalho apresenta como um problema de pesquisa a importância da eficiência, planejamento e princípios de boa gestão objetivando capilaridade e eqüidade para gerar maior acesso e qualidade dos serviços. O objetivo desse artigo foi identificar a expansão da Estratégia de Saúde da Família no Brasil entre 2007e 2020 e quais variáveis podem explicar essa evolução. Esse é uma pesquisa descritiva, ecológica, desenvolvida entre 2007 e 2020 no Brasil: sua variável de interesse foi a cobertura estimada da população dessa estratégia (%). Um aumento na cobertura da Estratégia de Saúde da Família foi observada em todas as regiões do Brasil entre 2007 e 2020, especialmente na região Nordeste. A nível estadual, essa cobertura mostrou uma relação significante positiva com as seguintes variáveis: cidades com menos de 40.000 habitantes e renda mensal inferior a metade do salário mínimo. A versão brasileira da Estratégia de Saúde da Família busca inspiração nos melhores e mais bem sucedidos modelos de saúde para alcançar alto desempenho e eficiência no fornecimento de eqüidade e acesso a serviços de saúde.

Palavras chave: estratégia de saúde da família, eqüidade, gestão, sistema único de saúde, gestão pública

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Introduction

The Family Health Program (FHP) was created by the ordinance 692/94 as a result of a reorganization of health care promoted by the Ministry of Health (MoH). As a result of an action from the organized society, the program started to have an exclusive treatment from the Ministery of Health and the Federal Government from 1996, thus, no longer being a program and becoming a strategy named Family Health Strategy (FHS), based on a health surveillance proposal, with the aim of improving the health indicators of the country with the transformation of health care practice*(1)*. The most comprehensive explanation of the primary health care as a strategy is the one widespread at the International Conference on Primary Health Care, held in Alma-Ata the capital of the Soviet Kazakhstan in 1978, cosponsored and organized by the World Health Organization (WHO) and UNICEF. The Health Care must be based on methods and practical technologies, scientifically demonstrated and socially acceptable, whose access is guaranteed to all people and families in the community, so that they can support it at a cost that both the community and each country may able to maintain in each stage of development in which is found the spirit of self- confidence and self-determination*(2).*

In the second half of the 80's decade, especially in 1986, it was held in Ottawa (1986), Canada, the first International Conference on Health Promotion which was based on the Alma-Ata declaration. Countries like Brazil, England, Canada, Chile and Cuba, among others, have adopted in their systems and health services the Family Health approach. Obviously, the implementation has happened at different times and has varied according to the singularity of each country*(3).*

The medical proposal of Family Health expanded initially in the United States in 1969 when it was known as familiar medicine and recognized as a medical specialty. In the 1970 decade, the movement expanded in Canada, México and a few European countries. What happened was a revisit to the past when the liberal physician used to take care of the whole family (whoever could afford to pay). The movement of a family doctor emerged to fight the inadequacies in medical practice through reorientation in the medical professional training without moving forward in the discussion of reorganization of health institutions*(4)*.

In the beginning of the 2000's, after the disillusion with structural adjustment and the election of center and center-left governments in much of Latin America, the health systems have begun to be more progressive*(5)*. Therefore, in this context, one of the best-known examples of this national expansion is the Brazilian Family Health Program (FHP), the program Barrio Adentro, in Venezuela and the program of Primary Attention to Health from Costa Rica, all of them based on the equitable access with multidisciplinary teams and actions over social determinants and integration of care among all the levels*(6)*.

Brazil makes the biggest efforts to improve the primary care in the country and the FHS fits this goal playing a key role in the consolidation of the universal coverage in the Unified Health System (SUS). Positive results have been achieved through the expansion of FHS, with emphasis on the reduction of infant mortality, primary care-related hospitalizations and mortality from cardiovascular diseases.

According to Mioto, the main goal of the FHS is to identify the sources of family difficulties, the possibilities of change and all the resources (both families and social means) that may contribute to families being able to articulate responses compatible with a better quality of life. Such changes imply transformations in the agendas of internal relations and in the relation between families and necessities*(7)*.

The performance appraisal of various Systems of Health was the reason for the creation of new indicators by the WHO which led to the construction of a compound indicator denominated Overall Health System Performance Indicator, whose publication World Health Report in 2020, aimed to focus on the issue of performance evaluation of Health Systems*(8)*.

In 2001, in order to recognize the importance of assessing the performance of the Brazilian health system, it was proposed the development of a Methodology for Health System Performance

Evaluation (Proadess) whose assessment would be an analysis of the political, social and economic contexts. The first phase of the project was terminated in 2003 with the presentation of a conceptual matrix, indicators recommendation, always having the equity as the transversal axis. In 2008 continuing the project, the Ministry of Health allocated more resources aiming to monitor inequalities in health care and to improve the access to the services*(9)*.

Other indicators of the evaluation and characterization of the Primary Health Care (PHC) are the result of approaches and observation to several theoretical and conceptual frameworks among which the publication "Primary Care: Balancing Health Needs, Services and Technology" from Starfield, 1998, deserves to be highlighted. In this regard, the evidence on the role of the PHC in health systems, scientific evidence of its impact on populational health and the comparison of cost benefits among countries with different shapes and various implementation degrees of this strategy, in addition to proposing a structure to measure it and define its particularities*(10)*.

Regarding the binomial efficiency and equity, it is important to imply and admit the concerns are the fuel to economic development coexisting with equity. In the Brazilian scenario the concern was to promote greater equity and closely connection with increasing efficiency, providing greater development and repairing social injustices.

The Family Health Strategy can be considered the main effort to improve primary health care in Brazil and has as its goal the need to get to know the reality of the population under its responsibility: the familiar contexts and community life*(1)*. FHS offers a wide range of services in primary health care and operates on a logical reorganization of the care model, the composition of the Family Health Program teams is multi-professional, with the minimal team composed of a generalist or specialist in Family Health (FH) physician or a Family and Community Physician; one generalist or specialist in FH nurse; one nursing assistant or technician; and a Community Health Agents (CHA) enough to cover 100% of the registered population, in a maximum of 750 people per CHA and 12 CHA per teams of FHP. To this composition also can be added, when available the Oral Care, a surgeon-dentist and one oral health assistant and the team implementation is responsibility of the mayor of the municipality*(11)*.

A multi-professional work of this magnitude requires constant training to attend the changes in work organization and in the way health care professionals act. It is also necessary that the individuals are committed and stablish bonds and their work processes revolve around a common goal*(11)*.

In terms of Coordination, the proposal for this model for the health care organization makes the PHC work process to be restructured aiming the substitution of ordinary practices. For health organizations to become efficient it is necessary to stablish relationships among people, technologies, resources and administration. Consequently, the administrative function plays an essential role in health institutions, perceived as management/coordination. In general, these coordinators are health professionals nominated by the municipal manager and/or district manager, health care workers and/or community leaders to manage the Family Health teams, in which, usually cover a certain described area of the municipality. Some of those, besides the supervision and essential technical support in the health care, also perform a political function aiming to integrate the health care teams and the municipal management*(12)*.

As for financing, consistently with the process of decentralization carried out in the country, the Constitutional Amendment n.29, 2020, was edited defining for the Union, States and Municipalities, a minimum percentual of application on health department. In accordance with the Constitutional Amendment n.29, 2020, each government level must ensure the regular contribution of resources to corresponding funds. The regular or occasional transferences from the Union to States and Municipalities are conditioned to the counterpart of them and are materialized by means of the National Health Fund (directly to States and Municipalities) and State Health Fund (to Municipalities)*(13)*.

In a continental-sized country and with such cul-

tural, ethnic and economic diversity, to satisfy the social demand for better health conditions respecting ethic principles becomes a challenge for managers, health care professionals and communities*(14)*.

The objective of this article was to identify the expansion or non-coverage of FHS in Brazil and its association with low-income people, Gini index, household income per capita, human development index (HDI) and cities with a population under 40.000 inhabitants.

Methods

Data Collection

This is a descriptive and ecological research in which the variable of interest is the populational coverage estimated of Family Health (%), named CobSF, whose analyzed historical series starts in July of 2007 and ends in December of 2020, time frame available until the moment when this research was ended. The data are from public domain and free access and were obtained from the Information System for Primary Health Care of the Ministery of Health*(15)*. Due to the minor fluctuation of the CobSF throughout the year, these data were used in annual format, considering CobSF in the month of December of each year, that is, the value of December 2009, for example, will represent the value of the year of 2009.

The other variables used, and their respective designations in parenthesis, were percentage of the population with income lower than half the minimum wage (RendaBaixa), Gini Index (IndiceGini), household income per capita (RendaDomic), human development index and percentage of cities with population under 40.000 inhabitants (PorcPequena). These data are public domain and all of them were collected from Demographic Census from the year of 2010 conducted by the Brazilian Institute of Geography and Statistics per Federative Unit*(16)*. It is worth mentioning the Federal District in Brazil is composed only for the city of Brasilia, so, this city was not considered in the model that related CobSF with the others since the variable PorcPequena calculation is unconceivable in this Federative Unit.

The spatial distribution of the populational coverage on Family Health Program (%) was presented according to the Regions and Federative Units in Brazil. The North region is *composed by* the states: Rondônia (RO), Acre (AC), Roraima (RR), Amazonas (AM), Pará (PA), Amapá (AP) and Tocantins (TO); the Northeast region: Maranhão (MA), Piauí (PI), Ceará (CE), Rio Grande do Norte (RN), Paraíba (PB), Pernambuco (PE), Alagoas (AL), Sergipe (SE) and Bahia (BA); the Southeast region: Minas Gerais (MG), Espírito Santo (ES), Rio de Janeiro (RJ) and São Paulo (SP); the South region: Paraná (PR), Santa Catarina (SC) and Rio Grande do Sul (RS) and the Midwest region: Mato Grosso do Sul (MS), Mato Grosso (MT), Goiás (GO) e Distrito Federal (DF). In order to identify the spatial changes on the coverage in Brazil, maps with data from 2007 and 2020 were elaborated.

This research was developed as a part of the Public Health post-graduation program from the Federal University of Juiz de Fora (UFJF), and it was not necessary an appreciation by Research Ethics Committee because were used data from official health information systems, public domain, respecting the principles of the National Health Council Resolution number 466, from December 12, 2012.

Statistic Analysis

The correlation among the variable CobSF and the other variables collected was investigated through the adjust of a linear regression model with Gaussian Errors. The model can be described as:

$$yi = \beta 0 + \sum_{j=1}^{p} xij\beta j + \epsilon i, = 1, \dots, n,$$

in which yi represents the response variable, xi, i = 1, ..., p, the explanatory variables, β= (β1, ..., βp)T is the coefficient vector of the model and $\epsilon i \sim N(0, \sigma 2)$ the random error, which follows regular distribution with an average zero and variance $\sigma 2$.

The least square method was used to find estimates of the coefficients. The standard error was estimated, and t-statistics and its respective p-value was calculated for each one of the coefficients. In case it is substantial, there is evidence that the variable in question helps explain the variation of

the response variable. To represent significance at a 10% level it was used a dot (.), at a 5% level an asterisk (*), at a 1% level two asterisks (**) and 0,1% level three asterisks (***).

In this study, the response variable is CobSF and each observation corresponds to a state, therefore, n=26. The explanatory variables are RendaBaixa, IndiceGini, RendaDomic, IDH and PorcPequena, thus, p = 5. The variables were patterned to avoid multicollinearity in the choice of the best model, which was made through the selection algorithm stepwise. After chosen the best model, the regression was adjusted with the variables in its original scale.

The statistical analysis was made through the programming language R version 4.1.1*(17)* and the model adjustment, specifically, was made by using the GAMLSS package*(18)*.

Results

It is presented on Figure 1 the evolution of CobSF per region in Brazil, in which is verified the increase in the coverage in all Brazilian regions throughout the analyzed period, from 2007 to 2020:

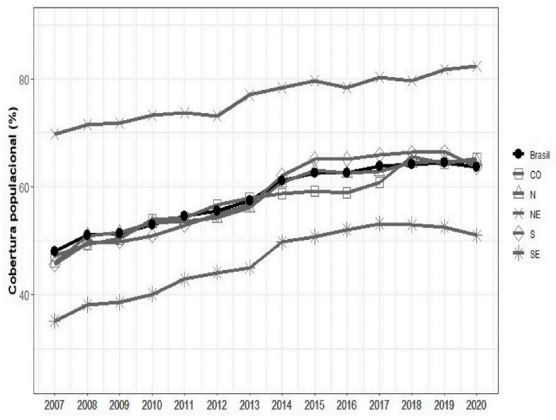


Figure 1 - Evolution of CobSF in Brazil and its regions, between the years of 2007 and 2020

Chart axis legend: Populational Coverage

Table 1 shows CobSF in 2007, 2019 and 2020 and the percentual variation that occurred between 2007 and 2020 and also 2019 and 2020.

The highest value of the CobSF was seen in 2007 and refers to the state of Piauí (PI), 95,91%, and maintained the highest value until 2020, 99,03 of coverage, while in 2007 the lowest coverage was in Distrito Federal (DF) with 4,77%, but in 2020 this position was occupied by the state of São Paulo (SP) with 38,82%. CobSF has growth in almost all the Federative Units in Brazil, except the state of Roraima (RR) with a reduction in coverage (-8,04%), ranging between 0,46% in Paraíba (PB) and 49,23% in Distrito Federal (DF). Regarding to the variations between 2019 and 2020, it is seen a reduction in 14 states and an increase in 13 states, varying between –4,11% in Rio Grande do SUL (RS) and 10,86% in Distrito Federal (DF).

On Figure 2 it can be observed the spatial distribution of CobSF in 2007 and 2020. While in 2007 there were 2 states, São Paulo (SP) and Distrito Federal (DF) presenting coverages under 25% and a coverage higher than 75% in only 6 stages, Tocantins (TO), Maranhão (MA), Piauí (PI), Rio Grande do Norte (RN), Paraíba (PB) and Sergipe (SE), whereas in 2020 there was no longer any state with a coverage under 25% and in the states with a coverage above 75% were added the states of Ceará (CE), Pernambuco (PE), Alagoas (AL) and Bahia (BA), integrating all the Northeast region, along with the states of Minas Gerais (MG), Santa Catarina (SC) and Acre (AC).

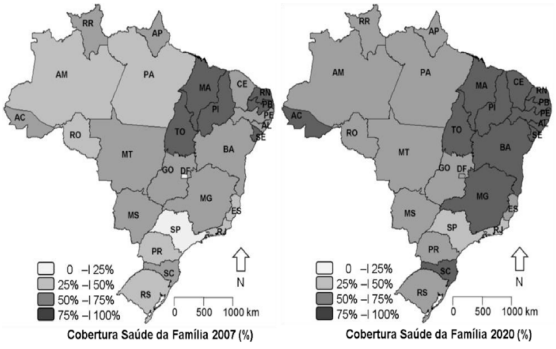


Figure 2. The Distribution of CobSF by Federative Units in 2007 and 2020 in Brazil

Legend: Family Health Coverage 2007 (%). Family Health Coverage 2020(%)

Table 1. Variation of the statewide percentage of CobSF from 2007 to 2020 and 2019 to 2020

Region	FU	2007	2020	Variation	2019	2020	Variation
North	RO	45.31	69.92	24.61	70.69	69.92	-0.77
	AC	61.54	75.18	13.64	71.38	75.18	3.8
	AM	48.14	64.12	15.98	61.17	64.12	2.95
	RR	74.56	66.52	-8.04	63.92	66.52	2.6
	PA	34.94	57.64	22.7	59.83	57.64	-2.19
	AP	59.41	63.73	4.32	59.01	63.73	4.72
Northeast	TO	76.53	92.76	16.23	94.15	92.76	-1.39
	MA	77.45	85.44	7.99	85.4	85.44	0.04
	PI	95.91	99.03	3.12	99.95	99.03	-0.92
	CE	68.1	83.88	15.78	82.9	83.88	0.98
	RN	78.63	80.56	1.93	78.28	80.56	2.28
	PB	94.53	94.99	0.46	95.85	94.99	-0.86
	PE	66.67	76.98	10.31	77.16	76.98	-0.18
	AL	70.09	75.54	5.45	75.99	75.54	-0.45
	SE	82.35	86.63	4.28	86.08	86.63	0.55
	BA	53.16	77.54	24.38	75.84	77.54	1.7
Southeast	MG	60.98	77.53	16.55	80.75	77.53	-3.22
	ES	46.29	65.11	18.82	63.22	65.11	1.89
	RJ	29.05	47.55	18.5	50.39	47.55	-2.84
	SP	24.3	38.82	14.52	39.47	38.82	-0.65
South	PR	48.51	63.31	14.8	64.6	63.31	-1.29
	SC	66.37	78.19	11.82	81.52	78.19	-3.33
	RS	31.61	54.87	23.26	58.98	54.87	-4.11
Middlewest	MS	54.2	74.57	20.37	70.65	74.57	3.92
	MT	57.82	70.12	12.3	69.86	70.12	0.26
	GO	56.91	64.07	7.16	68.08	64.07	-4.01
	DF	4.77	54	49.23	43.14	54	10.86

Source: elaborated by the authors.

Table 2. Matrix of correlation among variables (Source: elaborated by the author)

	RendaBaixa	IndiceGini	RendaDomic	IDH	PorcPequena
CobSF	0.55	0.20	-0.63	-0.55	0.65
RendaBaixa		0.72	-0.97	-0.95	0.08
IndiceGini			-0.59	-0.56	-0.16
RendaDomic				0.97	-0.21
HDI					-0.15

Table 3. Model Adjustment (Source: elaborated by the author)

	Estimative	Standard Error	t- statistic	p- Value	Significance
Intercept	-59.5712	18.8038	-3.1680	0.004455	**
RendaBaixa	0.5783	0.1302	4.4410	0.000205	***
PorcPequena	1.1718	0.2133	5.4930	0.000016	***

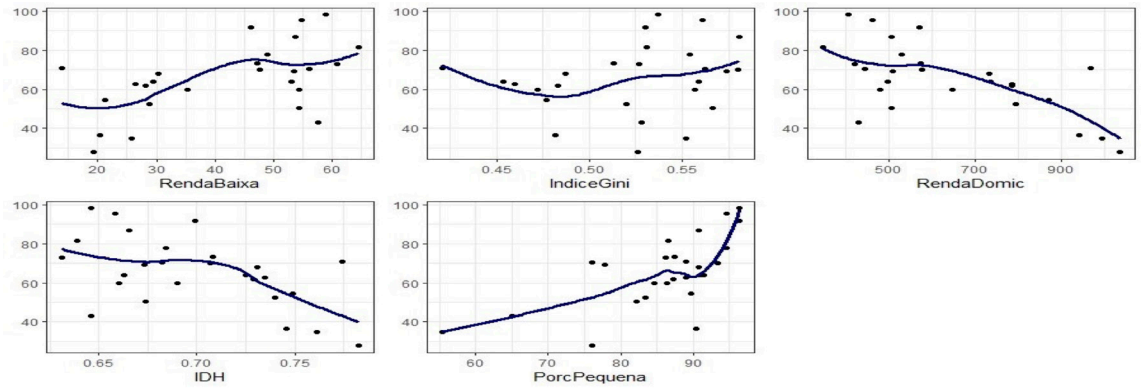


Figure 3. Scatter plots and curves adjusted by the local regression using the method LOESS, CobSF (y-axis)

Figure 3 shows scatter plots among the variable of interest and some variables referring to statewide population as well as non-linear trend curve, adjusted through local regression with LOESS method. It is notable an apparent positive correlation with the variables RendaBaixa and PorcPequena, negative correlation with RendaDomic and HDI and absence of explicit linear correlation with IndiceGini. A positive correlation indicates that once one increases, the other tends to increase as well, while a negative correlation indicates as one increases, the other tends to decrease.

However, some of these explanatory variables are highly correlated among each other. This can be seen from the correlation matrix presented below in Table 2. Strong correlations are noted among the variables RendaBaixa and IndiceGini, RendaBaixa and RendaDomic, RendaBaixa and IDH, RendaDomic and HDI.

As shown on Table 2, some explanatory variables are highly correlated, therefore these ones were patterned to avoid an issue of multicollinearity. After de application of a stepwise algorithm for the selection of the best model, the results presented in Table 3 were obtained and are adjusted in the variables original scale. It can be concluded the variables that help to explain the variation of CobSF in a significant way are RendaBaixa and PorcPequena. Both were significant at a 1% level of significance and presented positive coefficients, indicating that, on average, an increasing on RendaBaixa and PorcPequena are correlated with an increase in CobSF. In summary, states with a high population percentage with an income lower than half the minimum wage and with a high percentage of cities with a population of 40.000 inhabitants or less tend to present, on average, a high percentage of population covered by de Family Health Program.

The values of the coefficients indicate that an increase of 1 in RendaBaixa causes an increase of

0,5783 in CobSF and an increase of 1 in PorcPequena causes an increase of 1,1718 in CobSF. The estimative of the intercept represents the value of CobSF if RendaBaixa and PorcPequena were both equal to zero. Although it has no interpretation, the intercept is important for a good adjustment of the model and was, therefore, maintained.

Discussion

In conclusion, as described by Andrade et al. *(8),* the FHS is in a major position to reinforce the universal coverage of Brazilian health system and how it is organized, the FHS is the gateway to the Brazilian Unified Health Sistem as it guarantees to all the people to be registered and monitored in the health care system, creating a community whose program is based on integrated health care, where the family doctors are the main character.

Understanding the reason why many countries are not able to achieve good results in its investments in health care is one of the greatest challenges when it comes to global health care. Some of these countries manage to achieve equal or even better results than others, even spending half of its investment, once a higher efficiency is about more equity. Efficient health care systems that are able to provide greater equity have been practicing five successful principles in this field: integrated care in the Israeli model, standardization and simplification of the Indian model, prioritizing the social care in the Japanese model, hospitals as health care systems as in Singapore and, finally, an efficient payment system as the one used in the United Kingdom. On an international basis, comparing these models may offer a unique tool to politicians that are interested in comprehending if their health care systems are operating as well as they could and to identify improvements willing to guarantee a better functioning*(19)*.

According to the Ministry of Health, in 2006, the FHS had reached 87 million Brazilians with 27 thousand Family Health care teams. The Nacional Health Survey has pointed out that 60% of Brazilian households are registered in at least one Family Health Unit. The percentage represents 44 million households throughout the country.

The FHS conception brought all the Unified Health System closer to peripheral regions of the country, whereas once it was centered in metropolitan areas and more populous cities. Its implementation has helped to establish the principles of equity, universality and integrality in health care, contemplated in the Brazilian Federal Constitution of 1988*(20)*.

By the results presented, even towards big challenges, the expansion in the FHS coverage have been related to every region in Brazil and it is associated even to the smallest cities, under 40.000 inhabitants, in need of private and high complexity health care. In summary, states with a higher percentage of the population with an income lower than half the minimum wage and population of 40.000 inhabitants or less tend to present a higher percentage of the population covered by the FHP. Even expanding the FHS, a baseline populational study in the South region of Brazil identified that patients in a lower socioeconomic situation have had greater difficulty in accessing the Unified Health System's services*(21)*.

Besides the territorial expansion of the FHS, it must be considered that Brazil has a mixed health care system and ¼ of the population in a better financial situation have access to private health insurance, whilst the other part of the people depends exclusively on a public health care system able to assist the most vulnerable ones*(22)*.

While still valuing the association among the increase on the coverage of FHS and the ratio of small cities and low-income population, and not failing to mention the importance of other socioeconomic, demographic, political, geographic and individual variables, the expansion on the coverage of the Strategy has acted as a catalyst for the reduction on hospitalizations related to primary care conditions, mainly if this coverage is wider and easier to access*(13)*. For example, in the northern region of the country, in the Amazon Forest area, the increasing in coverage of the FHS has enabled access to local users, previously distant from SUS and its public health care services, reducing the quantity of hospitalizations and public medical expenses with patients *(23,24)*.

Along the same lines, in a medium-sized municipalities in the state of Paraná, South Region of

Brazil, it was identified a negative correlation between the increase on coverage of the Strategy and reduction of coefficients of hospitalizations related to non-communicable chronicle diseases associated to the reduction of expenses in SUS*(25)*.

In a national and international review study about the FHS in Brazil, it was demonstrated that the expansion of the Strategy has improved the access, the use of services and has promoted a reduction on the population health care inequality, mainly the most economical vulnerable and low-income population, covering the principles of equity and universality in health care*(26)*.

Conclusion

The Family Health Program was released by the Federal Government of Brazil in 1994 and with the expansion of the Unified Health System, a new model of health care was outlined and has promoted deep changes in the way of providing health care. The individual has become the center of the actions along with its family in their physical and social environment, combining health promotion actions with equity and also prevention and cure.

Besides difficulties been found, mainly in a country with huge dimensions and severe social inequalities, the expansion on the coverage of Family Health Strategy have been fulfilling its goal, enabling the access to health care services from Unified Health System towards the whole population and in every region of the country, especially the Northeast.

This expansion on the coverage of the Strategy can be justified by the presence of a positive association between the coverage of the Family Health Strategy and the regions with greater proportion of most economically vulnerable people, with an income lower than half the minimum wage and residents of municipalities with a population under 40.000 inhabitants.

Author Contributions

Luiz Oscar Machado Martins participated in the design of the project, development, writing and final revision of the project; Davi Oliveira Chaves responsible for designing the methods and statistical analysis; Marcio Fernandes dos Reis participated in the statistical analysis and final review of the project; Alfredo Chaoubah and Guilhermina Rego guided the production and revision of the text.

Funding

This research received no external funding.

Institutional Review Board Statement

The study was conducted in accordance with the Declaration of Helsinki.

Informed Consent Statement

Not applicable.

Data Availability Statement

The data presented in this study are available on request from the corresponding author.

Conflicts of Interest

The authors declare no conflict of interest.

References

1. Brasil. Ministério da Saúde. Secretaria de Políticas de Saúde. *A implantação da Unidade de Saúde da Família*. (Cadernos de Atenção Básica, 1). Brasília: Ministério da Saúde; 2000.
2. World Health Organization. *The World Health Report 2000: Health systems: improving performance.* Geneve: WHO; 2000.
3. Barros IC. *A importância da estratégia de saúde da família: contexto histórico*. [monografia]. Teófilo Otoni (MG): Universidade Federal de Minas Gerais; 2014.
4. Paim JS. Direito à Saúde, Cidadania e Estado. In: *Anais da 8ª Conferência Nacional de Saúde*; 1986 mar 17-21, Brasília, Brasil. Brasília: MS; 1986.
5. Ramírez NA, Ruiz JP, Romero RV, et al. Comprehensive primary health care in South America: contexts, achievements and policy implications. *Cad. Saúde Pública* 2011; 27(10): 1875-90.

6. Labonté R, Sanders D, Packer C, et al., editores. *Revitalizing Health for All Case Studies of the Struggle for Comprehensive Primary Health Care.* Toronto: University of Toronto Press; 2017.
7. Mioto R, Dalprá K. Serviços sociais e responsabilização da família: contradições da política social brasileira. In: *Anais do XIII Encontro Nacional de Pesquisadores em Serviço Social (ENPESS)*, 2012 nov 5-9; Juiz de Fora, Minas Gerais, Brasil. Juiz de Fora; 2012.
8. Andrade MV, Coelho AQ, Xavier Neto M, et al. Transition to universal primary health care coverage in Brazil: analysis of uptake and expansion patterns of Brazil's Family Health Strategy (1998-2012). *PloS One* 2018; 13(8): e0201723.
9. Fiocruz. *Projeto de Avaliação do Desempenho do Sistema de Saúde* PROADESS. Rio de Janeiro: Fiocruz; 2001 [cited 2022 Jul 16]. www.proadess.icict.fiocruz.br
10. Starfield B. *Atenção primária: equilíbrio entre necessidades de saúde, serviços e tecnologia*. Brasília: UNESCO/Ministério da Saúde; 2002.
11. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de AB. *Política Nacional de Atenção Básica*. Brasília: Ministério da Saúde; 2012.
12. Junqueira LAP. Gerência dos Serviços de Saúde. *Cad. Saúde Pública* 1990; 6(3): 247-59.
13. Aguiar DS. *A Saúde da Família no Sistema Único de Saúde: Um novo paradigma?* [dissertação]. Rio de Janeiro (RJ): Fundação Oswaldo Cruz, Escola Nacional de Saúde Pública; 2014.
14. Santos B, Lima D, Fontes C. Hospitalization for ambulatory care-sensitive conditions in the state of Rondonia, Brazil: descriptive study for the period 2012-2016. *Epidemiol. Serv. Saude* 2019; 28(1): e2017497.
15. Brasil. Ministério da Saúde. *Sistema de Informação em Saúde para Atenção Básica*. [cited 2022 Jul 16]. https://sisab.saude.gov.br/paginas/acessoRestrito/relatorio/federal/saude/RelSauProducao.xhtml
16. Instituto Brasileiro de Geografia e Estatística. *Estimativas da População*. 2021. [cited 2022 Aug 20]. https://www.ibge.gov.br/estatisticas/sociais/populacao/9103-estimativas-de-populacao.html?=&t=resultados
17. R Core Team. *A language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna, Austria. [cited 2022 Aug 10]. https://www.R-project.org/2021
18. Stasinopoulos MD, Rigby RA, Heller GZ, et al. *Flexible regression and smoothing: using GAMLSS* in R. New York: Chapman and Hall/CRC 2017.
19. Papanicolas I, Kringos D, Klazinga NS, et al. Health system performance comparison: new directions in research and policy. *Health Policy* 2013; 112(1-2): 1-3.
20. Eugênio S, Ventura C. Family Health strategy: a public initiative aimed at materializing the right to health among, vulnerable populations - a critical bibliographic review. *Cad. Ibero-Amer. Dir. Sanit.* 2017; 6(3): 129-43.
21. Wendt A, Marmitt LP, Nunes BP, et al. Socioeconomic inequalities in the access to health services: a population-based study in Southern Brazil. *Ciênc. saúde coletiva* 2022; 27(2): 793-802.
22. Serapione M, Tesser C. The Brazilian Health System in the face of international typology: a prospective and inevitable discussion. *Saúde debate* 2019; 43(n. esp 5): 44-57.
23. Santos BV, Lima DS, Fontes CJF. Hospitalization for ambulatory care-sensitive conditions in the state of Rondônia, Brazil: descriptive study for the period 2012-2016. *Epidemiol. Serv. Saude* 2019; 28(1): e2017497.
24. Carneiro VCCB, Oliveira PTR, Carneiro SR, et al. Evidence of the effect of primary care expansion on hospitalizations: Panel analysis of municipalities in the Brazilian Amazon. *PLOS ONE* 2021.
25. Campos JJB, Forster AC, Machado RC, et al. Study of the Ambulatory Care sensitive conditions in two large municipalities in Brazil. *R. Saúde Pública Paraná* 2019; 2(2): 49-58.
26. Macinko J, Mendonça CS. The Family Health Strategy, a strong model Primary Health Care that delivers results. *Saúde Debate* 2018; 42(n. esp. 1): 18-37.

Received: 20 June 2023
Accepted: 15 July 2023