

Equitable access to health services for children aged 5 to 9 in a medium city of northeast of Brazil: a result of Family Health Strategy

Equidade no acesso aos serviços de saúde entre crianças de 5 a 9 anos em uma cidade média do nordeste do Brasil: resultado da Estratégia Saúde da Família

Adriana Xavier de Santiago¹, Ivana Cristina de Holanda Cunha Barreto¹, Ana Cecília Silveira Lins Sucupira^{II}, José Wellington de Oliveira Lima^{III}, Luiz Odorico Monteiro de Andrade¹

ABSTRACT: Introduction: The Brazilian National Health System may reduce inequalities in access to health services through strategies that can reach those most in need with no access to care services. **Objective:** To identify factors associated with the use of health service by children aged 5 to 9 years in the city of Sobral, Ceará, northeastern Brazil. **Results:** Only 558 (17.0%) children used health care services in the 30 days preceding this survey. Children with any health condition (OR = 3.90) who were frequent attenders of primary care strategy of organization (the Family Health Strategy, FHS) (OR = 1.81) and living in the city's urban area (OR = 1.51) were more likely to use health services. Almost 80% of children used FHS as their referral care service. Children from poorer families and with easier access to services were more likely to be FHS users. **Conclusion:** The study showed that access to health services has been relatively equitable through the FHS, a point of entry to the local health system.

Keywords: Social determinants of health. Health service/utilization. Health services accessibility. Equity. Family Health. Child Health Services.

¹Universidade Federal do Ceará – Fortaleza (CE), Brazil.

^{II}Universidade de São Paulo – São Paulo (SP), Brazil.

^{III}Universidade Estadual do Ceará – Fortaleza (CE), Brazil.

Corresponding author: Adriana Xavier de Santiago. Departamento de Saúde Comunitária, Universidade Federal do Ceará. Rua Professor Costa Mendes, 1.608, 5º andar, Rodolfo Teófilo, CEP: 60430-140, Fortaleza, CE, Brazil. Email: santiagoax@yahoo.com.br

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RESUMO: *Introdução:* O sistema de saúde deve ser capaz de reduzir a desigualdade no acesso aos serviços através de estratégias que alcancem aqueles que têm mais necessidade e não conseguem chegar até eles. *Objetivo:* Identificar os fatores associados à utilização dos serviços de saúde entre crianças de 5 a 9 anos do município de Sobral (CE). *Resultados:* Apenas 558 (17,0%) crianças utilizaram os serviços de saúde no mês anterior à entrevista. A ocorrência de problemas de saúde (OR = 3,90), a utilização frequente da Estratégia Saúde da Família (ESF) (OR=1,81) e o fato de residir na sede do município (OR = 1,51) aumentaram a chance de utilização. Quase 80% utilizam a ESF como serviço de referência. As crianças de famílias mais pobres e com melhores condições de acesso tiveram mais chance de utilização da ESF. *Conclusão:* Os resultados do estudo sugerem que o acesso aos serviços de saúde ocorrem de forma relativamente equitativa graças à definição da ESF como porta de entrada para o sistema público de saúde do município.

Palavras-chave: Determinantes sociais de saúde. Serviços de saúde/ utilização. Acesso aos serviços de saúde. Equidade. Saúde da Família. Serviços de Saúde da Criança.

INTRODUCTION

Dahlgren and Whitehead's model supports that health services are the main social determinants of health mediating health promotion and maintenance¹. But health service utilization is inequitable. The literature shows health services are mostly used by women^{2,3}, who are white^{4,5}, have higher schooling^{5,6} and monthly income, and good or excellent self-rated health^{3,7}.

The health system may reduce this inequality in access through strategies that can reach people that are most in need, with no access to care services because of personal, social, and geographic factors.

Evidence shows that health systems have been actively reducing health and social inequalities. In countries where there are no universal free public health systems, the poor become poorer due to health-related problems.

A World Health Organization (WHO) report on children's health revealed that in Asian countries the financial cost to meet the population's health needs is higher among the poor than the rich⁸.

Andersen⁹ proposed a behavioral model of health service utilization that identifies factors associated with service utilization and provides measures of access to medical care and a classification of the determinants related to the health service utilization.

The model includes factors associated with contextual characteristics of health service utilization (demography, health policies, health financing, organization), individual characteristics (gender, skin color/race, income, health needs), health behaviors (diet, physical exercise, patient-provider relationship, frequent health service utilization) and user satisfaction¹⁰.

In Brazil several studies on health service utilization have used data from the National Household Survey (PNAD), Health supplement^{2,11-13}. However, these studies have been based on data at the national level, not taking into consideration local specific characteristics. It was thus possible to investigate aspects not previously identified in the national survey, for instance, in the Pelotas¹⁴, São Paulo¹⁵ and Sobral, Ceará, studies¹⁶.

The current study aimed to identify factors associated with health service utilization in children aged 5 to 9 years living in an urban area, and characterize the local health system in terms of equity in access.

METHODS

A study was conducted in Sobral, a city located in the northern region of the state of Ceará, northeastern Brazil. The city of Sobral is geographically divided into a main administrative area and 11 districts. According to the 2000 Population Census, Sobral had a population of 155,276 inhabitants, with 86.6% and 13.4% living in urban and rural areas, respectively. It had a predominantly young population, 48% were within the age group 0 to 19 years¹⁷.

The data used in this study were obtained from the supplement Consumption of Health Services, part of a population-based survey entitled "Study of health status, education and quality of life in children aged 5 to 9 years living in the urban area of Sobral, Ceará, Brazil". The study was approved by the Research Ethics Committee of Universidade Estadual Vale do Acaraú. There were conflicts of interest.

A random sampling, stratified by year of birth, based on the registration of sample units (households) was carried out by family health teams and officers from the Sobral Department of Health. Only one child per household was included and a sample of children born between 1990 and 1994, aged between 5 and 9 years, was drawn. The sample size was calculated based on the estimated prevalence of events to be studied for a lowest rate of 10%. A total of 2,900 children would be required. The drawing of 4,400 children provided a loss of 10%.

The final sample comprised 3,274 children. Household interviews were conducted with the child's parent (mother) or caregiver. The methods of this study have been detailed by Barreto and Grisi¹⁶.

The dependent variables were health service utilization during the 30 days preceding the survey (yes/no); and most frequently used service (FHS/other). The dependent variable was dichotomized to use logistic regression (FHS/other). Originally, the answers were:

FHS, hospital, private health insurance and others. In the current study, FHS stands for the health care unit providing FHS services. The independent variables or determinants were defined as proposed by Andersen⁹.

The predisposing variables were: gender; age; skin color/race; child relationship to the head of family; and maternal level of education. The variables related to resources available included area of residence; number of people living in the household; *per capita* household income; number of household consumer goods; frequent health service utilization; proximity/travel time to health services; private health insurance. The need for care was defined as the occurrence of any health condition in the 15 days preceding the study.

For the identification of factors associated with frequent health service utilization and utilization in the 30 days preceding the survey, Pearson's χ^2 , linear trend and Fisher's exact tests were performed when appropriate. For quantitative variables Student's t-test was performed to identify differences between means. For significant variables at 5%, the *Odds Ratios* (OR) and their confidence intervals (CI) were estimated. Logistic regression was used to determine the final explanatory model of health service utilization. Models were constructed for each dependent variable including factors associated with $p \leq 0.20$ in the χ^2 test.

Several models were tested, and the final model had the highest coefficients of determination, Cox & Snell R^2 and Nagelkerke R^2 . In addition, the model's goodness of fit was assessed using the Hosmer-Lemeshow test¹⁸. Data analysis was performed using the Statistical Package for Social Sciences (SPSS) version 15.

RESULTS

Regarding Andersen's predisposing factors, the study sample had a similar proportion of female and male children ($n = 1,637$ subjects each). A total of 2,370 children (72.4%) were referred by their parent/caregiver as black/mulatto/mixed skin color, while 894 (27.3%) were referred as white. The father was the head of the household for 2,275 (69.6%) children while other relative was the head for 538 (16.4%). Almost half (46.9%) of the mothers had up to three years of schooling (Table 1).

Data analysis revealed that 2,864 (87.5%) children lived in the main administrative area; 2,554 (78.0%) mothers/caregivers thought they lived close to a health care unit, while 337 (10.3%) thought it was far from their homes; 2,060 (62.9%) children were usually consulted on the same day that they searched for care and 1,151 (35.2%) were sometimes or never consulted on the same day; 2,996 (91.5%) were enrolled in the FHS; only 186 (5.7%) had private health insurance (Table 2).

Regarding resources available, the average number of people living in the household was 6 (standard deviation – SD = 2.2 people). The average monthly household income was 2.4 minimum monthly wages (MMW) (1 MMW = US\$ 84.83). The *per capita* monthly income was on average slightly lower than 0.5 MMW. However, there was a wide income difference between families (SD = 0.55).

The travel time to the health unit from home ranged between 1 minute to 5 hours, mean 11.6 minutes (SD = 12 min).

With regard to health needs (Table 3), 1,439 (44.0%) children had any health condition during the 15 days preceding the study. Only 558 (17.0%) of the children had used health services during the 30 days prior to the study.

A (crude) univariate analysis was performed to assess the associations between the study variables and health service utilization during the 30 days preceding the survey. None of the predisposing factors was statistically significant. Regarding the resources available, the analysis showed that children living in the main administrative area were 1.87 times more likely to use health services than those living in rural districts ($p < 0.001$).

Frequent FHS utilization (Table 4) was associated with health service utilization. Those who were frequent FHS attenders were 1.78 times more likely to use any service during the 30 days preceding the survey compared to those who were occasional attenders or non-attenders ($p < 0.001$).

Table 1. Predisposing characteristics of children aged 5 to 9 years, city of Sobral, Ceará, northeastern Brazil, 1999 – 2000.

Variables	n	%
Gender		
Female	1,637	50.0
Male	1,637	50.0
Skin color		
Black/mullato/mixed	2,370	72.4
White	894	27.3
Other	10	0.3
Head of the household		
Father	2,275	69.6
Mother	329	10.0
Other relative	538	16.4
Other	132	0.4
Mother schooling		
0 years	391	11.9
1 – 3 years	1,145	35.0
4 – 7 years	898	27.4
8 – 11 years	359	11.0
≥ 12 years	302	9.2
No mother/missing	179	5.5

Table 2. Enabling resources of children aged 5 to 9 years, city of Sobral, Ceará, northeastern Brazil, 1999 – 2000.

Variables	n	%
Area of residence		
Main administrative	2,864	87.5
Districts	410	12.5
Distance FHS to home		
Close	2,554	78.0
More or less	374	11.4
Far	337	10.3
Missing	9	0.3
Consultation on the same day		
Always	2,060	62.9
Sometimes	985	30.1
Never	166	5.1
Missing	63	1.9
Enrollment in the FHS		
Yes	2,996	91.5
No	275	8.4
Missing	3	0.1
Private health insurance		
Yes	186	5.7
No	3,067	93.7
Missing	21	0.6
Variables	Mean	SD
Total of household members	5.9	2.2
Average monthly household income	2.4	2.7
<i>Per capita</i> monthly income (MMW)	0.46	0.55
Household consumer goods	3.8	1.3
Travel time to the FHS unit from home (minutes)	11.6	12.0

FHS: Family Health Strategy; SD: standard deviation; MMW: minimum monthly wages.

Table 3. Health needs of children aged 5 to 9 years, city of Sobral, Ceará, northeastern Brazil, 1999 – 2000.

Variables	n	%
Occurrence of any health condition in the 15 days prior to study		
Yes	1439	44.0
No	1835	56.0
Health service utilization in the 30 days prior to study		
Yes	558	17.0
No	2715	82.9
Missing	1	0.1
Type of health service utilization		
FHS	2586	79.1
Hospital	443	13.5
Private practices or contracted health services	112	3.4
Other	116	3.5
Missing	17	0.5

Table 4. Final model of health service utilization in the 30 days preceding the survey, city of Sobral, Ceará, northeastern Brazil, 1999 – 2000.

Variables	Crude				Adjusted			
	OR	CI95%	p-value*	OR	CI95%	p-value*		
Occurrence of any health condition in the 15 days prior to study								
Yes	3.92	3.21	4.78	< 0.001	3.90	3.19	4.77	< 0.001
No	1.00				1.00			
Frequent FHS utilization								
Always	1.78	1.48	2.14	< 0.001	1.81	1.50	2.19	< 0.001
Occasional	1.00				1.00			
Area of residence								
Main administrative area	1.87	1.35	2.60	< 0.001	1.51	1.04	2.18	0.03
Districts	1.00				1.00			

*significant.

Cox & Snell $R^2 = 8\%$; Nagelkerke $R^2 = 13\%$; Hosmer-Lemeshow test: $p = 0.79$.

Regarding the need for care, as measured by the occurrence of any health condition during the 15 days preceding the study (Table 4), a child who had any health condition was 3.92 times more likely to use health services compared to those who did not ($p < 0.001$).

The (adjusted) multivariate analysis showed that the following factors were associated with health service utilization in the 30 days preceding the survey: occurrence of any health condition in the 15 days preceding the study; frequent FHS utilization; and area of residence (Table 4). They were all included in the final model.

In our results, those children with any health condition in the 15 days preceding the study were 3.90 times more likely to use a health service. Studies have evidenced an association between health service utilization and self-rated health status. However, the types of services used are different. Individuals who self-rated their health status as poor/very poor are more likely to use emergency services and hospital admissions.

The model showed that children who were frequent FHS attenders were 1.81 times more likely to use health services in the 30 days preceding the survey. The FHS was implemented in the city of Sobral in 1997, in units selected based on the local community needs and at locations that would allow easy access to services¹⁹. A mean travel time on foot from home to the FHS unit of about 11 minutes found in the current study and that almost all children took no more than 0.5 hour to get to the unit. In addition, more than 90% of the households surveyed were enrolled in the FHS.

Table 4 also shows that children living in the main administrative area were 1.51 times more likely to use health services than those living in rural districts. Area of residence is determinant for health service utilization mainly because of service availability and access. Fewer services are available in rural areas, and most health services are concentrated in large urban centers. Moreover, people living in rural areas take longer to get to health services from home, thus their need for care is the most driving factor for seeking care.

Since the study found a relatively equitable access to health services in the city of Sobral, the next step was to identify potential differences between types of service available.

A total of 2,586 (79.1%) respondents said their children were frequent attenders of the FHS while 443 (13.5%) reported using a hospital service. Only 112 (3.4%) children attended private practices or contracted health services. The remaining 4% of the sample reported turning to other types of care (pharmacies, healers, godmothers and grandmothers) or did not answer the question (Table 3).

To identify factors associated with the type of service more frequently used, this variable was dichotomized as FHS and Other services. The final model of frequent FHS utilization included the following variables: maternal level of education, residence in main area of the municipality, consultation on the same day, enrollment in the FHS, private health insurance, per capita monthly income, household consumer goods, and travel time to the FHS unit from home (Table 5).

Frequent utilization of a FHS unit was greater among those with lower education. Children whose mothers had ≤ 7 years of schooling were twice more likely to use the FHS than those whose mothers had ≥ 8 years of schooling. This finding contrasts with those reported in other studies, which demonstrated a positive relationship, i.e., greater health service utilization among more educated people, regardless of service category (private or public)^{5,14,20}.

Table 5. Final model of frequent health service utilization of the Family Health Strategie program, city of Sobral, Ceará, northeastern Brazil, 1999 – 2000.

Variables	Crude			Adjusted				
	OR	95%CI	p-value*	OR	95%CI	p-value*		
Mother schooling (years)								
0	6.97	4.86	10.01	< 0.001	2.09	1.29	3.40	0.001
1 – 3	7.05	5.33	9.34	< 0.001	2.50	1.71	3.66	< 0.001
4 – 7	5.09	3.84	6.75	< 0.001	2.11	1.47	3.04	< 0.001
8 – 11	3.19	2.30	4.41	< 0.001	1.47	0.99	2.20	0.057
≥ 12	1.00				1.00			
Residence area								
Main administrative area	1.00				1.00			
Districts	3.62	2.47	5.31	< 0.001	6.32	3.40	11.73	< 0.001
Consultation on the same day								
Always	2.04	1.45	2.86	< 0.001	1.05	0.65	1.70	0.83
Sometimes	3.22	2.23	4.65	< 0.001	1.88	1.13	3.13	0.02
Never	1.00				1.00			
Enrollment in the FHS								
Yes	5.21	4.03	6.73	< 0.001	3.74	2.70	5.19	< 0.001
No	1.00				1.00			
Private health insurance								
Yes	1.00				1.00			
No	9.26	6.73	12.73	< 0.001	3.69	2.46	5.55	< 0.001
<i>Per capita</i> monthly income (MMW)	0.23	0.19	0.28	< 0.001	0.42	0.32	0.54	< 0.001
Household consumer goods	0.63	0.58	0.67	< 0.001	0.84	0.76	0.92	< 0.001
Travel time to the FHS unit from home (minutes)	0.97	0.96	0.98	< 0.001	0.96	0.95	0.97	< 0.001

*significant.

Cox & Snell R² = 20%; Nagelkerke R² = 32%; Hosmer-Lemeshow test: p = 0.49; FHS: Family Health Strategy; MMW: minimum monthly wages.

With regard to reside in the main area of the municipality, those living in the districts were 6.32 times more likely to use the FHS than those living in the main administrative area. This can be explained by the fact that the FHS was the only service available in the districts, for hospitals and private and contracted outpatient services are only available in the main administrative area.

Respondents enrolled in the FHS and who did not have private health insurance were 3.7 times more likely to use the FHS than those who were not enrolled in the program and had private insurance ($p < 0.001$).

A major factor for FHS utilization was the enrollment of families by community health workers (CHWs). According to Andrade and Martins Junior¹⁹, the enrollment of families by CHWs was the first action for FHS implementation in each area covered.

Our study showed that the higher the *per capita* income and household consumer goods, the lower FHS utilization. For each unit of increment in per capita income there was a 58% reduction in the likelihood of using the FHS (OR = 0.42). For each unit of increment in consumer goods there was a 33% reduction in the likelihood of using the FHS (OR = 0.67).

Children who were sometimes consulted on the same day were 1.88 times more likely to use the FHS than those who were never consulted on the same day ($p = 0.02$). Travel time to the FHS from home was also associated with the use of this service. For every one-minute increase in travel time, there was a 4% reduction in the likelihood of using it (OR = 0.96). The location of the FHS unit was also a major factor affecting service utilization. Respondents who reported living close to a FHS unit were more likely to use the service.

DISCUSSION

HEALTH SERVICE UTILIZATION DURING THE 30 DAYS PRECEDING THE SURVEY

According to the 1998 PNAD data, the proportion of people who regularly use health services is 10% higher in urban areas². However, in Brazil, differences are not only seen between urban and rural areas. Data analyzed by macroregions showed that different service availability also affected utilization. Compared to the south and southeastern macroregions, health service utilization was lower in the northern (45%), northeastern (40%) and central-western regions (23%) in 2003⁶.

The study in Sobral in 2000 did not corroborate some factors previously reported in other studies^{5,6,21} as associated with health service utilization. For example, education and socioeconomic condition (income, household consumer goods, and private health insurance) did not show a significant association with health service utilization.

In a population-based study conducted in southern Brazil, the final model also included the need for care and frequent health service utilization as the main variables associated with utilization of outpatient services in the two months prior to the study. However, predisposing factors and resources available were also included in the model: gender, income, education, stressful life events and private health insurance²⁰.

The factor most strongly associated with health service utilization in the 30 days prior to the survey was the occurrence of any health condition, i.e., need for care. According to

Andersen¹⁰, a health system should not be defined by health beliefs or resources available, but rather by individual health needs.

Hence, the model of health service utilization during the 30 days prior to the study showed that the local health system in Sobral provided relatively equitable access for the children studied.

FREQUENCY OF HEALTH SERVICE UTILIZATION

The 2003 PNAD data showed that over 60% of consultations in the 15 days preceding to the study was covered by SUS, 27.9% by private health insurance and only 10% by out-of-pocket payment¹³. A study by Puccini et al.²² found that 88% of children under 5 received care in public health services, out of which 35.1% were seen at public primary care units and 11.6% at private or contracted services.

The rate of consultations at SUS in the city of Sobral was higher than that reported in the 2003 PNAD. In contrast, the rate of care provided in private or contracted services was much lower than that reported nationwide. High coverage of FHS in Sobral may explain why more than 70% of the sample used this service in the month prior to the study.

The final explanatory model of FHS as a referral care service showed that, except for maternal level of education, factors associated with the use of service were related to available resources. It demonstrated that poorer children with lower education and uninsured who lived in the city's districts were the most frequent attenders of the FHS. In fact, the population group that is most susceptible to diseases and has the largest proportion of poor health status was the one that benefited most from FHS. It is also true that these children had easier access to FHS, were enrolled in the program and lived closer to care unit.

These results are different from other studies^{21,23} that showed that outpatient service utilization was greater among those with higher economic condition, education and income and that unfavorable social conditions tended to reduce the likelihood of using these care services.

The SUS has ensured access to health services for disadvantaged population groups through the FHS. Travassos et al.²¹ compared data on health service utilization from 1989 to 1996 – 1997 and found that a health policy introduced during this period had an impact towards more equitable access to health. Barata et al.⁵ have argued that the SUS appears to ensure access to medical consultations and hospitalization due to illness (poor health status) regardless of race and family income.

According to Andersen criteria, health systems explained only by the resources available can be classified as inequitable. This author argues that people with lower economic conditions and education and poor health status living far from urban centers are the least likely to use health services.

Yet in the current study, although the explanatory model included almost exclusively variables related to the resources available, the contrasting finding was that those poorer

with lower education living in remote areas were more likely to use health services. It seems reasonable to classify the local health system as equitable because it actually benefits those most in need.

Data from the 1998 and 2003 PNAD and other local studies showed that social inequalities in Brazil has been reduced in some aspects but health service utilization only increased in areas where service organization and availability improved^{6,21,22,24}.

Goldbaum et al.²⁴ analyzed health service utilization in an area with FHS and another one without it. In the FHS area, income and education were not associated with service utilization while that in the non-FHS area utilization was higher among people with higher educational level and income. This study corroborates that the FHS actively promotes equity in health.

Puccini et al.²² conducted a study in the metropolitan area of São Paulo, southeastern Brazil, based on the assumption that disadvantaged population groups did not have access to health care. Their hypothesis was not confirmed because there was no significant difference in health service utilization in the past 15 days. The main service used was a primary care unit.

Fernandes et al.²⁵ found a utilization profile similar to our results. Individuals with lower socioeconomic conditions and uninsured were more likely to use the FHS unit in the past 15 days preceding the survey. In contrast, those with higher socioeconomic conditions and health insurance coverage were more likely to use other types of services, including hospital services, private and contracted clinics, among others. These authors points to a reduction in inequalities in utilization after the implementation of SUS and FHS. New health policies promoted the inclusion of lower income populations probably through the strategy of making the family health team work in their area of coverage.

As to the need for care, information is a key factor for improving people's perception of their health status and practices of health promotion and disease prevention. Andersen⁹ suggests educational campaigns, and incentives can be used to improve service utilization and help changing this perception.

Frequent or excessive FHS utilization can be improved by ensuring adequate quality of care, physical infrastructure and provisions, and a policy for human resources for health addressing from labor issues to continuing education. There is also a need for effective communication with the local population to encourage adequate service utilization. Mendoza-Sassi et al²⁰ suggest that education campaigns guide people to best use health services and asserts that exercising this right is a way to promote utilization among most people in need.

Finally, regarding the area of residence, it is known that districts and rural areas have less health services available and therefore lower utilization rates. This inequality can be tackled by providing more health services in these areas.

CONCLUSIONS

The study results showed there was virtually no inequality in access to health service and equity was fairly achieved in public health care in Sobral. It is a result of the adoption

of primary care strategy, especially the Family Health Program. Frequent service utilization was seen among most vulnerable people, who require priority care. This finding emerged from an analysis by type of service evidencing the profiles of different service users.

One important limitation of this study lies in the fact that the need for care was measured only by any health condition reported by the child's mother/caregiver. An actual self-rated assessment of health needs was not conducted, neither was performed a proper medical evaluation of these children's health needs, which probably underestimated the weight of this variable.

There are many aspects that need improvement in order to achieve universal health care for all. Actions should be taken so that non-attenders will become aware of service availability and frequent attenders will continue using the services provided.

Improved quality of care including effective patient-provider communication, reduced waiting time for care, and flexible working hours (lunch time, third shift and weekends) is critical to attract people to the FHS units.

Studies on utilization and access to health services at the local level are crucial, for they can provide information on different local Brazilian realities. Brazil has marked health inequalities nationwide, but a shift of focus to the cities shows the importance of FHS for promoting equity.

The need for regular surveys such as the PNAD should be emphasized. Consecutive local surveys carried out years apart can provide data to assess whether the FHS keeps bringing constant benefits to the city after its implementation.

The current study was not specifically designed to identify a perfect model for health service utilization. Many individual and contextual characteristics were not included in the study, even though some of them are known to possibly affect the use of health services. The study revealed some pieces of a very complex puzzle that brings together socioeconomic and demographic characteristics and perception of health needs, which cannot be fully understood through theoretical models and statistical analyses. But the local organization of SUS based on the FHS showed it has the power to change it.

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