

## Prevalence of having a regular doctor, associated factors, and the effect on health services utilization: a population-based study in Southern Brazil

Prevalência do médico de referência, fatores associados e seu efeito na utilização de serviços de saúde: um estudo de base populacional no Sul do Brasil

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**Abstract** *In order to assess the prevalence of having a regular doctor, associated factors, and the effects on health services utilization, a cross-sectional study was performed in Rio Grande, Brazil, from January to May 2000. A total of 1,260 individuals 15 years or over were interviewed. Adjusted prevalence ratios and 95% confidence intervals were calculated, using a Poisson regression model. Some 37% of the sample had a regular doctor. Adjusted analysis revealed a direct and linear association with income. Female gender, age, private health insurance coverage, and chronic health problems were also associated with the outcome. Having a regular physician was associated with a 51% increase in clinical breast examination and a 62% increase in cervical cancer screening during the previous year, as well as a 98% increase in prostate cancer screening in the previous year in men 40 years or over. The study concluded that the prevalence of having a regular doctor in Brazil is low and is directly associated with socioeconomic factors. Individuals with a regular physician tend to have better access to health services. The promotion of consultation with a regular doctor among the population may improve health care quality and health services access, particularly in the poorest groups.*

**Key words** *Health Services Accessibility; Continuity of Patient Care; Regular Doctor*

**Resumo** *Com a finalidade de estudar a prevalência do médico de referência, os fatores associados e seu efeito na utilização de serviços de saúde, foi realizado um estudo transversal, na cidade de Rio Grande, Brasil, entre janeiro e maio de 2000. Um total de 1.260 pessoas com 15 anos ou mais foram entrevistados. Calcularam-se as razões de prevalência e os intervalos de confiança de 95%, utilizando o modelo de Poisson. A prevalência de médico de referência foi de 37%. A análise ajustada mostrou uma associação direta e linear com renda. Sexo feminino, idade, seguro de saúde e problema crônico de saúde também associaram-se com o desfecho. Ter um médico de referência provocou um aumento de 51% na probabilidade de realizar um exame clínico de mama, e de 62% de realizar a prevenção do câncer de colo, durante o último ano. Nos homens, aumentou a probabilidade de realizar um exame de próstata em 98%, para o mesmo período. Pode-se concluir que a prevalência do médico de referência no Brasil é baixa e associada diretamente aos fatores sócio-econômicos. Pessoas com esta característica tem melhor acesso a serviços de saúde. A promoção do médico de referência na população pode melhorar o acesso aos serviços de saúde e melhorar a qualidade da atenção, especialmente nos grupos mais pobres.*

**Palavras-chave** *Acessibilidade aos Serviços de Saúde; Continuidade de Assistência ao Paciente; Médico de Referência*

## Introduction

Having a regular doctor characterizes continuity of health care and is associated with improved health services utilization. Continuity of care has two different meanings: the follow-up from one visit to another ("continuity" *per se*), and the constant ("longitudinal") relationship between patient and health care provider (Rogers & Curtis, 1980; Starfield, 1980). This paper will use the latter definition, and the variable "regular doctor" will be employed as a proxy.

A regular source of care, and particularly a regular doctor, can be considered a component of health services which improves accessibility (Andersen & Aday, 1978). Studies have demonstrated a strong association between this characteristic and health services utilization (Hayward et al., 1991). Having a regular doctor is associated with an increase in the number of visits (Lambrew et al., 1996) and a decrease in both the number of hospitalizations (Wasson et al., 1984) and length of stay (Mainous & Gill, 1998). Individuals with a regular physician decide to see their doctor earlier (Sox et al., 1998) and wait less time for an appointment (Forrest & Starfield, 1998). In countries like Canada and England, which have universal-access health systems with the general practitioner at the center, there are high proportions of people with a regular physician. In the United States, the prevalence of consultation with a regular doctor varies from 70 to 80% and is closely associated with socioeconomic status (Hayward et al., 1991; Lambrew et al., 1996; Mainous & Gill, 1998). There is limited information about such prevalence in other countries.

In Brazil, several authors have identified inequity in health services access (Almeida et al., 2000). As discussed by Travassos (1997), the Unified Health System (SUS) created in 1988 attenuated some (but not all) of these differences, and further measures are needed to improve access. Recently introduced health policies and programs like the Family Health Program have tended to improve access to health services and to reduce inequities between groups.

There is little information about either frequency or regularity in the source of care (i.e., the physician or site of care) or related factors in Brazil. According to a study by Stein in Porto Alegre, southern Brazil, 30% of users of an emergency room (ER) in a hospital located within an area with a family health program had their own regular physician (Stein, 1998). According to a national household survey on health services utilization and access, 28.8% of

the population had no regular source of care (IBGE, 1998).

Since having a regular physician is associated with improved access and quality of health care, it is relevant to ask who is more likely to have a regular doctor in Brazil and what effects this could have on health services utilization. Thus, the aim of this paper is to: (a) study the prevalence of having a regular doctor among the adult population in a city in Southern Brazil; (b) identify associated factors; (c) assess the distribution across socioeconomic groups; and (d) study the effect on preventive and non-preventive visits to the physician. The information obtained here will aid in the design of future interventions to improve accessibility and quality of care.

## Methods

### Study design and sample

A cross-sectional study was performed from January to May 2000 in an urban population 15 years of age or over in the county of Rio Grande, southern Brazil, where only five percent of the population lives in the countryside. The sample size was calculated to detect a relative risk (RR) of two, with 80% power, 95% confidence level, a 6:1 ratio of unexposed/exposed, and a 17% prevalence rate for having a regular doctor among the unexposed. The initial sample size was increased by 10% for losses, 20% to control confounding, and 20% for design effect, thus reaching 641 individuals. A cluster sampling process was performed, using census tracts.

The proportion of individuals 15 years or over residing in the city in 1996 was 73%, with an average of 3.4 individuals per household (1996 Census). Consequently, the required number of households to reach the projected sample was 264. Since this survey was part of another study requiring a larger sample, a total of 540 households were visited. Forty-five of the 242 census tracts inside the city limits (2000 Census) were selected. One block from each census tract was randomly selected, as was one corner from each block. Every third household from the selected corner was visited until data were collected from 12 households.

Twelve trained interviewers applied a pre-coded and pre-tested questionnaire. All individuals 15 years or over were considered eligible for the study. Seven percent of the individuals were re-visited by an independent interviewer for quality control purposes. Two independent technicians entered the information in an EpiInfo 6.04b database. The data were

cleaned by the researchers for consistency and amplitude errors, and the database was converted to Stata 6.0 for Windows to perform the statistical analysis.

### Variables

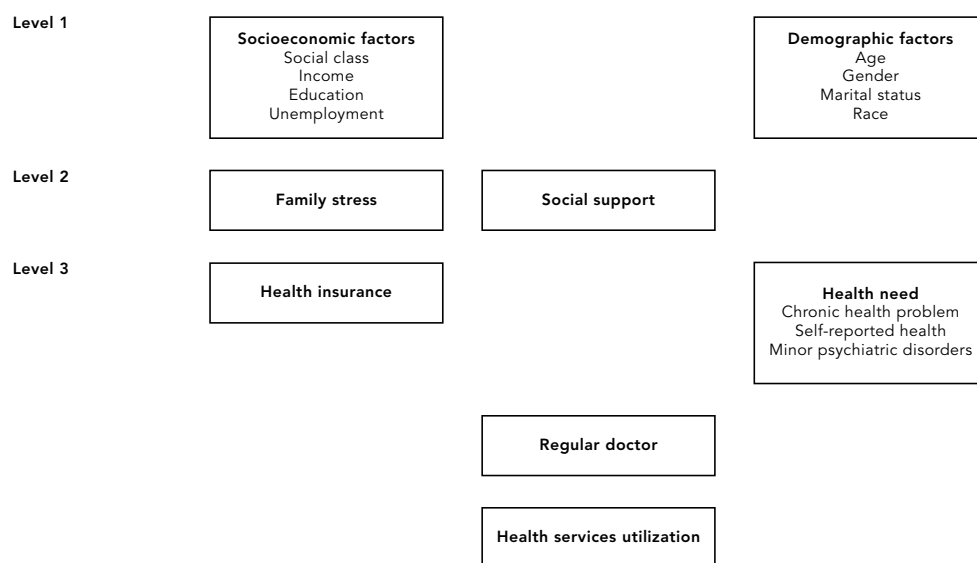
The questionnaire included questions on socioeconomic, demographic, social, psychological, health services, and self-reported health needs data. A brief definition of some questions is provided below. The dependent variable “regular doctor” was used as a proxy for continuity of care. A conceptual framework was used, based on the hierarchical level of determination (Victora et al., 1997). Figure 1 represents the hierarchical position of factors in relation to the outcome and was constructed taking causality and temporality into account. At the first level of determination, socioeconomic and demographic factors appear which determine the others. Immediately below, social and psychological variables are represented which can affect some variables at the subsequent level. The third level contains factors closely related to the outcome. Finally, the outcome “regular doctor” is considered a determinant of health services utilization.

### Definition of variables

- Regular doctor, defined by three consecutive questions: “If you have a health problem and decide to see a doctor, is there a physician to whom you normally go?” “What is the doctor’s name?”, and “How long has he/she been your doctor?” The variable is considered positive if the interviewee answered “yes” to the first question, provided the doctor’s name, and reported having consulted this physician for more than 12 months.
- Social class, defined according to criteria set by the Brazilian Association for Market Research (ABIPEME). This is a composite variable based on years of schooling and type of utilities present in the household and has 5 categories in descending order: A, B, C, D, E (ANEP, 1997).
- Family stress, or family dysfunction measured by a questionnaire (Smilkstein, 1979), with a score from 0 to 10. Classified as “absent” (score 0-4) and “present” (score 5-10).
- Social support, or assistance that individuals expect from others in case of any kind of problem. Measured as “no” (if they never or only sometimes expect to receive help) or “yes” (if they always or frequently expect to receive help).

Figure 1

Hierarchical analysis model for having a regular doctor.



- Health insurance, if the person has any other health insurance besides public coverage under the SUS.
- Chronic health problem, if the doctor informed the person that he/she had a chronic health problem.
- Self-perceived health, addressed by the question "How has your health been in the last 12 months prior to the interview?" Rated as poor, fair, good, or excellent.
- Minor psychiatric disorders, or non-psychotic disorders assessed by *Self-Report Questionnaire-20* (Mari & Williams, 1986). A five/six cut-off point was used for men and seven/eight for women.
- Visit to doctor, if the person had visited a doctor within the previous 12 months.
- Clinical breast examination, performed by a physician in women 40 years or over in the previous 12 months.
- Mammography, in women 40 years or over in the previous 12 months.
- Breast self-examination, by women 15 years or over.
- Cervical cancer screening in women 40 years or over in the previous 12 months.
- Prostate cancer screening: digital rectal examination, biochemical test, or ultrasound in men 40 years or over in the previous 12 months.

#### Statistical analysis

Stata 6.0 for Windows was used for statistical analysis. A significance level of 0.05 was previously defined. Prevalence ratios (PR) and 95% confidence intervals (CI) were calculated in the bivariate analysis. A chi-square test was used to assess their significance. A Poisson model was used in the multivariate analysis. The choice of this particular type of regression was based on the higher prevalence of the outcome, in which case an OR would overestimate the PR. Since the study focuses on prevalence and associated factors for having a regular doctor, a PR tends to be more useful. The use of models such as Cox regression has been suggested in order to directly estimate the PR (Lee & Chia, 1993, 1994). The problem with this approach is that the CIs are larger than they should be. However, if the observational periods are equal for every case, the Poisson regression is equivalent to the Cox model, with the advantage that it is possible to correct the CIs by using a robust estimation of variance, based on sandwich estimators (Lin & Wei, 1989). Therefore, and based on the suggestion by Hirakata (2000), a Poisson regression with robust estimation of variance was used in

order to obtain a direct estimate of the PR with corrected CIs.

The Wald test was used to assess the significance of the results for dichotomous and continuous variables. Linear trends were explored for ordinal categorical data, and a linear hypothesis test was performed using the estimation parameters. Variables were entered using a conceptual framework (Victoria et al., 1997), as shown in Figure 1. A backward regression technique was performed at each level. Variables with a  $p \leq 0.2$  and/or a  $PR \geq 1.5$  were retained for the next level, due to the possibility of negative confusion. Kappa test was performed to measure the inter-rater agreement of categorical data in the quality control group. In order to consider the distance between non-concordant rates for variables with more than two possible rates, a weighted kappa was calculated.

## Results

### Characteristics of the sample

A total of 540 households with 1,348 individuals were visited, and 1,260 individuals answered the questionnaire. Of the 88 (6.6%) who were not included in the study, 57 refused to participate, and 31 had not been located after three attempts. The kappa results of the quality control interviews were all above 0.8. Table 1 shows the frequency of the study factors. Mean monthly per capita family income (and SD) by group were: US\$ 33.59 (15.35) in group 0-56, US\$ 73.03 (8.74) in group 57-92, US\$ 136.68 (30.68) in group 93-194, and US\$ 443.16 (328.83) in group 195-5000. More than 20% of the sample had completed only three years of school or less, and the overall illiteracy rate was 7%. There were more women than men (54%), and most of the interviewees were white (85%). Mean age was 40.33 years (SD 17.71), range 15-94 years.

Chronic health problems were reported by 25% of the sample, and the same proportion reported poor or fair health within the last year; 38% had some additional health insurance beyond public coverage. More than 71% reported having a regular source of health care for more than a year; 37% reported having a regular doctor, and 34% reported using a regular site of care. When no time restriction was used, the latter two prevalence rates increased to 41% and 36%, respectively.

Some 66% of the sample reported having visited a doctor in the previous year. Within the previous 12 months, 31.2% of women aged 40 or over had received a clinical breast examination,

Table 1

Sample study characteristics. Rio Grande, Rio Grande do Sul State, Brazil, 2000 (n = 1,260).

Characteristic	%
Social class – ABIPEME* (n = 1,258)	
E	4.1
D	29.4
C	39.7
B	23.9
A	2.9
Education: years of schooling completed (n = 1,259)	
3 or fewer	21.2
4-7	32.4
8-10	21.1
11 or more	25.3
Gender	
Male	46.1
Female	53.9
Age groups	
15-24	23.9
25-44	37.1
45-64	27.8
≥ 65	11.2
Race	
White	84.7
Black & other	15.3
Marital status	
Married	61.3
Divorced	6.6
Single	26.9
Widowed	5.2
Family stress (0 to 10 points)	
Score 5 or more	9.0
Social support (n = 1,256)	
None	9.3
Occasional	10.1
Frequent	9.6
Constant	71.0
Health insurance	38.4
Chronic health problem	25.4
Self-reported health: previous 12 months	
Good/Excellent	74.4
Poor/Fair	25.6
Minor psychiatric disorders	
Male	12.7
Female	22.1

(continues)

Table 1 (continued)

Characteristic	%
Physician visit in previous 12 months (n = 1,247)	66.3
Clinical breast cancer examination** in previous 12 months (n = 333)	31.2
Breast self-examination (n = 674)	57.4
Mammography** in previous 12 months (n = 333)	17.4
Cervical cancer screening** in previous 12 months (n = 333)	36.6
Prostate cancer screening*** in previous 12 months (n = 267)	22.5
Regular doctor for more than 12 months (n = 1,244)	37.4
Regular site of care for more than 12 months (n = 1,244)	34.1

\* ABIPEME: Brazilian Association for Market Research.

\*\* women 40 years or over.

\*\*\* men 40 years or over.

17.4% a mammography, and 36.6% cervical cancer screening; 57.4% of women 15 or over reported performing breast self-examination. In men 40 or over, 22.5% had undergone prostate cancer screening during the previous year.

#### **Bivariate analysis**

Table 2 presents the crude PR for having a regular doctor and the study factors. A dose-response relationship was found between social class and the outcome; compared to the lowest class, class C showed a 29% increase in the probability of having a regular doctor, while classes A/B showed a 71% increase. The income variable also showed a dose-response relationship, and compared to the poorest group (E), group D displayed a 33% increase and group C a 65% increase, while the highest-income group had a more than twofold increase. Each year of schooling increased the probability of the outcome by more than 1%, but this increase was not significant (PR: 1.013; 95% CI: 0.99-1.04;  $p = 0.3$ ).

Among demographic factors, female gender increased the probability of having a regular doctor by more than 50%. There was an age-related dose-response relationship, and in comparison with the youngest group, the 25-44-year group had a 58% increase, the 45-64-year group a more than twofold increase, and the oldest group a nearly threefold increase. Blacks and other non-Whites were 30% less likely to have a regular physician than Whites. In relation to social and psychological factors, individuals from dysfunctional families were 27% less likely to have a regular doctor. For persons with social support, there was a non-significant 15% increase as compared to those without support.

As expected, there was an association between the outcome and additional health insurance; individuals with private insurance were 80% more likely to have a regular doctor. Two of the morbidity variables were significantly associated: individuals with chronic health problems showed a nearly twofold increase in the PR of having a regular doctor, while those with poor/fair self-reported health showed a 36% increase. There was no association in either men or women between the outcome and the presence of minor psychiatric disorders.

#### **Multivariate analysis**

As displayed in Table 3, for the first level of analysis and after adjustment, most of the socioeconomic and demographic factors remained significantly associated with the outcome. The dose-response relationship for the income variable persisted, and depending on the study category there was a 17%, 41%, or 70% increase in the probability of having a regular doctor. Each year of school increased the probability of having a regular doctor by two percent, but the significance test was above the defined cut-off point (PR: 1.02, CI: 0.99-1.04,  $p = 0.08$ ). Social class was removed from the model because it did not meet the previously defined criteria.

There were no major changes in demographic variables after adjustment. Women maintained a 50% increase in the probability of having a regular doctor, and the age-related dose-response relationship persisted. Compared to the youngest group, the 25-44-year group showed a 63% increase in the outcome, the 45-64-year group showed a more than twofold increase, and the oldest group had a nearly threefold in-

Table 2

Regular doctor and crude prevalence ratios for some demographic, socioeconomic, social, and morbidity characteristics. Rio Grande, Rio Grande do Sul State, Brazil, 2000 (n = 1,244).

Characteristic	Prevalence % (n)	PR (95% CI)	p
Social class (ABIPEME) (n = 1,242)			
D-E	28.7 (118)	1	0.001**
C	36.9 (183)	1.29 (1.06-1.56)	
A-B	48.9 (164)	1.71 (1.41-2.06)	
Monthly per capita family income US\$ (n = 1,227)			
0-56	24.3 (83)	1	0.001**
57-92	32.5 (89)	1.33 (1.04-1.72)	
93-194	40.2 (125)	1.65 (1.31-2.08)	
195-5,000	52.8 (159)	2.17 (1.75-2.69)	
Schooling (years)			
1 yr.		1.01 (0.99-1.04)	0.3
Gender			
Male	28.6 (163)	1	
Female	44.7 (302)	1.56 (1.34-1.82)	0.001
Age by group			
15-24	21.4 (63)	1	0.001**
25-44	33.8 (155)	1.58 (1.23-2.04)	
45-64	45.9 (161)	2.15 (1.68-2.75)	
65 or more	61.9 (86)	2.90 (2.25-3.74)	
Race			
White	39.0 (412)	1	
Black & others	28.2 (53)	0.72 (0.57-0.92)	0.005
Marital status			
Married	40.3 (308)	1	0.001*
Divorced	43.4 (36)	1.08 (0.83-1.40)	
Single	59.4 (38)	1.47 (1.18-1.84)	
Widowed	47.8 (143)	0.82 (0.61-1.11)	
Social support (n = 1,240)			
No	33.2 (80)	1	
Yes	38.1 (381)	1.15 (0.94-1.40)	0.09
Family stress (n = 1,240)			
No	38.1 (430)	1	
Yes	27.7 (31)	0.73 (0.53-0.98)	0.03
Health insurance			
No	28.2 (215)	1	
Yes	51.9 (250)	1.84 (1.59-2.12)	0.001
Chronic health problem			
No	29.9 (277)	1	
Yes	58.9 (188)	1.99 (1.72-2.25)	0.001
Self-reported health			
Good/Excellent	34.2 (315)	1	
Poor/Fair	46.4 (150)	1.36 (1.14-1.62)	0.001
SRQ+ male			
No	28.5 (141)	1	
Yes	29.7 (22)	1.04 (0.72-1.52)	0.8
SRQ+ female			
No	43.9 (230)	1	
Yes	47.3 (71)	1.08 (0.89-1.31)	0.5

\* P for at least one PR  $\neq$  1.

\*\* Linear trend test.

Table 3

Regular doctor and adjusted prevalence ratios for demographic, socioeconomic, and morbidity characteristics. Rio Grande, Rio Grande do Sul State, Brazil, 2000.

Characteristic	PR (95% CI)	p
Monthly per capita family income <sup>a</sup>		
0-56	1	0.001*
57-92	1.17 (0.89-1.53)	
93-194	1.41 (1.05-1.89)	
195-5,000	1.70 (1.29-2.23)	
Schooling <sup>a</sup>		
1 year	1.02 (0.99-1.04)	0.08
Gender <sup>a</sup>		
Male	1	
Female	1.53 (1.34-1.75)	0.001
Age group <sup>a</sup>		
15-24	1	0.001*
25-44	1.63 (1.19-2.25)	
45-64	2.07 (1.49-2.87)	
65 or more	2.84 (1.95-4.14)	
Health insurance <sup>b</sup>		
No	1	
Yes	1.48 (1.19-1.84)	0.001
Chronic health problem <sup>b</sup>		
No	1	
Yes	1.54 (1.32-1.80)	0.001
Self-reported health <sup>b</sup>		
Good/Excellent	1	
Poor/Regular	1.22 (1.03-1.46)	0.02

\* Linear trend test.

<sup>a</sup> First level: per capita income, schooling, gender, and age (n = 1,226).

<sup>b</sup> Third level: first level + chronic health problem, health insurance, and self-reported health (n = 1,226).

crease. At the second level, none of the social or psychological variables met the established criteria, and were thus removed from the model.

At the third level of analysis, and adjusted to previous factors, most of the variables remained associated with the outcome. The probability for individuals with health insurance was attenuated but still maintained an increase of nearly 50%. For individuals with chronic health problems, the probability of having a regular doctor was 54%. For those who reported poor or fair health, probability of the outcome was 22% greater. No association was found with minor psychiatric disorders.

Table 4 shows the crude and adjusted effects of having a regular doctor on some key health services utilization measures. Before controlling for demographic, socioeconomic, health-insurance, and health-need variables, individu-

als with continuity of care showed a significant increase in the probability of making preventive and non-preventive visits to their physician. After adjustment, the target characteristic remained significantly associated with some health services utilization measures: women 40 years or over with continuity of care had a 51% greater probability of clinical breast examination and 62% greater probability of cervical cancer screening within the previous year; men aged 40 or over with a regular doctor had an 98% increased probability of prostate cancer screening in the same period; individuals aged 15 years or over with the target characteristic increased the probability of having visited a doctor in the previous year by 23%. There was a non-significant increase in the probability of breast self-examination and mammography.

## Discussion

Results of the multivariate analysis suggest that individuals with a regular doctor enjoy better access to health services, including preventive visits, and that this characteristic is strongly associated with socioeconomic status. However, there are some possible methodological constraints.

First, no causality can be inferred, because temporal criteria between outcome and independent variables were not sufficiently established, although some attempts were made in this direction. The findings must therefore be interpreted merely as associations. While the possibility of reverse causality between exposure to a regular doctor and utilization of health services exists, it is less likely, because in order to be classified as having a regular doctor, the individual had to report having visited this physician for more than 12 months (while most of the health services utilization variables were measured for the previous 12 months). In addition, selection bias should also be considered. However, since losses were only seven percent, this type of bias appears unlikely. Even so, the proportion of men in the sample was lower than in the losses (46% vs. 69%, p = 0.01); if the men who did not answer the questionnaire were more closely associated with the outcome, then the effect of gender might have been overestimated. However, other studies addressing this issue have found a very similar effect, making this bias less likely (Hayward et al., 1991; Merzel, 2000).

Keeping these possible limitations in mind, the study shows that having a regular doctor in Brazil is not as common as in other countries,



Table 4

Effect of regular doctor on health services utilization. Rio Grande, Rio Grande do Sul State, Brazil, 2000.

Utilization measure	Crude PR (95% CI)	p	Adjusted PR (95% CI)*	P
Clinical breast examination (n = 327)**	1.57 (1.13-2.17)	0.007	1.51 (1.09-2.10)	0.01
Breast self-examination (660)	1.21 (1.04-1.41)	0.02	1.11 (0.94-1.32)	0.2
Mammography (332)**	2.09 (1.13-3.85)	0.02	1.58 (0.82-3.04)	0.2
Cervical cancer screening (n = 327)**	1.57 (1.18-2.09)	0.002	1.62 (1.18-2.21)	0.003
Prostate cancer screening (n = 264)**	2.89 (1.89-4.43)	0.001	1.98 (1.25-3.12)	0.004
Visit to doctor (n = 1,224)**	1.36 (1.26-1.48)	0.001	1.23 (1.12-1.35) ***	0.001

\* Adjusted for age, income, schooling, health insurance, chronic health problem, and self-reported health.

\*\* Within previous 12 months.

\*\*\* Adjusted to previous variables and gender.

reaching only 37% of the population aged 15 years or over. Even if one places no time restriction on the definition of "having a regular doctor", the prevalence only increases to 41%. While these proportions are higher than the 30% found by Stein (1998), they are not as high as might be expected. Although Stein's study was done in an emergency ward, where it is more likely to find patients without continuity of care, the hospital where the study was conducted had a well-organized family health program in the surrounding neighborhood, thus possibly explaining the small difference. The results are consistent with those of the 1998 household survey (IBGE, 1998). Considering all individuals with a regular source of care (physician or health care facility), the prevalence reached 71.5%, almost the same proportion found in the above-mentioned household survey (71.2%).

Also consistently with other studies (Merzel, 2000), women were more likely to have a regular doctor than men, possibly reflecting reproductive health needs. It was also consistent that the frequency of having a regular doctor increased with age (CDC, 1998). In agreement with other studies, individuals with greater health needs and those with health insurance were more likely to have a regular doctor (CDC, 1998; Hayward et al., 1991).

There was a strong association between "regular doctor" and socioeconomic variables. The complete linear trend with income clearly shows that the likelihood of continuous care increases with per capita income. As other studies have shown, the poor are more likely to lack a regular doctor because of financial barriers (Hayward et al., 1991). This situation is cause for concern because, as discussed below, having a regular doctor is associated with a higher rate of health services utilization, and the dis-

parity therefore indicates a potential source of inequity.

Individuals with a regular doctor have better access to certain health services, including preventive ones. Even after adjusting for some potential confounders, continuity of care increased the probability of a physician visit, clinical breast examination, and cervical cancer screening, as other authors have found (Lambrew et al., 1996). The absence of effect on mammography may be due to lack of power (the identified prevalence ratio for this characteristic was less than expected). In the case of breast self-examination, the absence of association may reflect the impact of public campaigns addressing this issue. Another important finding is that men also benefited from having a regular doctor (for example, showing better access to prostate cancer screening).

In conclusion, the results emphasize the importance of having a regular doctor in Brazil. Health authorities should be aware that the frequency is not as high as in other countries and that a campaign focusing on the importance of continuity of care could provide a good strategy for improving health services access and quality of health care.

Furthermore, Brazilian health authorities should realize that access to a regular doctor is unequal across socioeconomic groups, and a specific campaign targeting the poorest population should be a priority. By enjoying continuity of care, these underserved groups will gain better quality of health care and improved access to health services, thus diminishing the differences in comparison to higher income groups. The Family Health Program, implemented in Brazil since 1994, deals specifically with this issue.

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## References

- ALMEIDA, C.; TRAVASSOS, C.; PORTO, S. & LABRA, M. E., 2000. Health sector reform in Brazil: A case study of inequity. *International Journal of Health Services*, 30:129-162.
- ANDERSEN, R. & ADAY, L. A., 1978. Access to medical care in the US: Realized and potential. *Medical Care*, 16:533-546.
- ANEP (Associação Nacional de Empresas de Pesquisas), 1997. *Economic Classification Criterion – Brazil 2000*. 20 March 2000 <[http://www.anep.org.br/CCEB\\_ENGLISH.pdf](http://www.anep.org.br/CCEB_ENGLISH.pdf)>.
- CDC (Centers for Disease Control and Prevention), 1998. Demographic characteristics of persons without a regular source of medical care: Selected States, 1995. *JAMA*, 279:1603.
- FORREST, C. B. & STARFIELD, B., 1998. Entry into primary care and continuity: The effects of access. *American Journal of Public Health*, 88:1330-1336.
- HAYWARD, R. A.; BERNARD, A. M.; FREEMAN, H. E. & COREY, C. R., 1991. Regular source of ambulatory care and access to health services. *American Journal of Public Health*, 81:434-438.
- HIRAKATA, V. M., 2000. *Alternatives for Logistic Regression in Cross-Sectional Studies: An Empirical Comparison of Models that Directly Estimate the Prevalence Ratio*. Dissertação de Mestrado, Pelotas: Universidade Federal de Pelotas.
- IBGE (Fundação Instituto Brasileiro de Geografia e Estatística), 1998. *Pesquisa Nacional por Amostragem de Domicílios. Acesso e Utilização de Serviços de Saúde*. Brasília: IBGE.
- LAMBREW, J. M.; DEFRIESE, G. H.; CAREY, T. S.; RICKETTS, T. C. & BIDDLE, A. K., 1996. The effects of having a regular doctor on access to primary care. *Medical Care*, 34:138-151.
- LEE, J. & CHIA, K. S., 1993. Estimation of prevalence rate ratios for cross sectional data: An example in occupational epidemiology. *British Journal of Industrial Medicine*, 50:861-862.
- LEE, J. & CHIA, K. S., 1994. Use of the prevalence ratio vs. the prevalence odds ratio as a measure of risk in cross-sectional studies. *Occupational and Environmental Medicine*, 51:841.
- LIN, D. & WEI, L., 1989. The robust inference for the Cox proportional hazards model. *Journal of the American Statistical Association*, 84:1074-1078.
- MAINOUS, A. G. & GILL, J. M., 1998. The importance of continuity of care in the likelihood of future hospitalization: Is site of care equivalent to a primary clinician? *American Journal of Public Health*, 88:1539-1541.
- MARI, J. & WILLIAMS, P., 1986. A validity study of a psychiatric screening questionnaire (SRQ-20) in primary care in the city of São Paulo. *British Journal of Psychiatry*, 148:23-26.
- MERZEL, C., 2000. Gender differences in health care access indicators in an urban, low-income community. *American Journal of Public Health*, 90:909-916.
- ROGERS, J. & CURTIS, P., 1980. The concept and measurement of continuity in primary care. *American Journal of Public Health*, 70:122-127.
- SMILKSTEIN, G., 1979. The family APGAR: A proposal for family function test and its use by physicians. *Journal of Family Practice*, 6:1231-1239.
- SOX, C. M.; SWARTZ, K.; BURSTIN, H. R. & BRENNAN, T. A., 1998. Insurance or a regular physician: Which is the most powerful predictor of health care? *American Journal of Public Health*, 88:364-370.
- STARFIELD, B., 1980. Continuous confusion? *American Journal of Public Health*, 70:117-119.
- STEIN, A. T., 1998. *Acesso a Atendimento Médico Continuado: Uma Estratégia para Reduzir a Utilização de Consultas Não Urgentes em Serviços de Emergência*. Tese de Doutorado, Porto Alegre: Universidade Federal do Rio Grande do Sul.
- TRAVASSOS, C., 1997. Equidade e o Sistema Único de Saúde: Uma contribuição para debate. *Cadernos de Saude Pública*, 13:325-330.
- VICTORA, C. H.; FUCHS, S. & OLINTO, M. T., 1997. The role of conceptual frameworks in epidemiological analysis: A hierarchical approach. *International Journal of Epidemiology*, 26:224-227.
- WASSON, J. H.; SAUVIGNE, A. E. & MOGIELNICKI, P., 1984. Continuity of outpatient medical care in elderly men: A randomized trial. *JAMA*, 252:2413-2417.

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