

Socioeconomic inequalities in the access to health services: a population-based study in Southern Brazil

Desigualdades socioeconômicas no acesso aos serviços de saúde:
um estudo de base populacional no sul do Brasil

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Abstract *This article aims to measure socioeconomic inequalities regarding access to health services, contact with health professionals, and specific health interventions. This was a cross-sectional population-based study with individuals aged 18 years or older, living in the city of Rio Grande. The outcomes were the following: Family Health Strategy (FHS) coverage; having a health insurance plan; receiving a visit of a community health worker; medical consultation; dental consultation; dietary counseling; having a class with a physical education professional; flu vaccination; mammography, cytopathological and prostate exams. Relative and absolute measures were used to assess inequalities in the distribution of the outcomes. There was a response rate of 91% (1,300 adults were interviewed). Coverage indicators ranged from 16.1%, for having a class with a physical education professional, to 80.0% for medical consultation. FHS coverage and visit of a community health agent presented higher proportions among the poorest while outcomes regarding contact with health professionals, screening exams and flu vaccine were more prevalent among richest group. We observed low coverage levels of access to health services and professionals in addition to marked socioeconomic inequalities.*

Key words *Health services, Health inequalities, Socio-economic*

Resumo *O objetivo deste artigo é mensurar desigualdades socioeconômicas no acesso a serviços de saúde, no contato com profissionais e em intervenções específicas. Estudo transversal de base populacional com indivíduos (18 anos ou mais) vivendo em Rio Grande. Os desfechos mensurados foram: cobertura da Estratégia de Saúde da Família (ESF), plano de saúde, visita do agente comunitário de saúde, consulta médica, consulta com dentista, aconselhamento nutricional, aula com professor de educação física, vacina da gripe, mamografia, exames citopatológico e de próstata. Medidas de desigualdade absolutas e relativas foram utilizadas para avaliar a distribuição dos desfechos. A taxa de resposta foi de 91% (1.300 adultos entrevistados). A cobertura dos indicadores variou de 16,1%, para ter aula com professor de educação física, a 80,0%, para consulta médica. Cobertura de ESF e visita do agente comunitário de saúde apresentaram maior proporções entre os mais pobres, enquanto desfechos de contato com profissionais de saúde, exames de rastreamento e vacina da gripe foram mais prevalentes entre os mais ricos. Foram observadas baixas coberturas de acesso aos serviços e contato com profissionais, bem como desigualdades sociodemográficas importantes.*

Palavras-chave *Serviços de saúde, Desigualdades, Socioeconômico*

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Introduction

Socioeconomic inequalities in Brazil are a historical problem¹. Even with a couple of decades with significant growth, disparities in income distribution remained, resulting in attenuated but persistent health inequalities². In addition, wealth inequalities are also responsible for altering the health profile of the population³, with substantial differences in health-related behaviors and outcomes observed among population groups, and in general, more significant difficulties to access health care are observed among the poor^{2,4,5}.

Universality is one of the fundamental principles of the Brazilian Unified Health System (Sistema Único de Saúde – SUS). It determines that access to actions and services must be guaranteed to all people, without discrimination⁶. Many programs and strategies have been created over time to guarantee this access to health. The most important was the Family Health Program (FHP), created in 1994, to allow teams of doctors, nurses, and community health workers to work in strategic locations in the country⁷. Despite the created strategies and the relative growth of the public sector, and mainly the subsidized growth of the country's private services, the persistence of inequalities imposes a need to identify vulnerable groups. The prevalence of health care for specific groups may differ from national averages, with vulnerable groups showing results that can be both worse and very distant from other groups^{4,5}.

Previous studies in Brazil have shown this perspective of inequality at the national level⁴. A study with a sample from the National Health Survey carried out in 2013 found lower access to health services among the poorest individuals and young adults⁸. In terms of changes over time, a study using data from National Households Sample Surveys (Pesquisa Nacional de Saúde – PNAD) assessed whether the participants visited a doctor or dentist. It also assessed whether they had been hospitalized in the last 12 months and whether they had sought health care in the last two weeks. A decrease in inequalities was observed for all outcomes between 1998 and 2008. However, a persistent difference between the poorest and the richest groups was observed⁹. Regarding prevalence of reproductive and maternal interventions, there is also evidence regarding the relevance of implementing SUS as a strategy for reducing inequalities across the time^{10,11}.

In this context, it is possible to assume that a substantial part of the social disparities for morbimortality results from unequal access to health care¹². Identifying health inequalities and

assessing their magnitude is essential to ensure universal access to health, quality of life, and social well-being, and develop strategies to decrease social injustices. Although some evidence at the national level is available to understand changes over time and the current scenario of socioeconomic health inequalities, monitored at the local level, are still required to help planning efficient strategies to improve public system process¹¹. Furthermore, Brazil is a vast country with different characteristics across the cities. Our study is carried in a medium-sized Southern city of the country and understanding how inequalities behave in small cities may help to promote health in this context. Thus, this study aims to measure socioeconomic inequalities in health services, contact with health professionals and specific health interventions using a population-based sample of adults from a city in Southern Brazil.

Methods

This was a cross-sectional population-based study with individuals aged 18 years or older, living in the city of Rio Grande, Southern Brazil. Rio Grande has about 200 thousand inhabitants, with 96% of them residing in the urban area. This study is part of a larger project entitled “Health of Population of Rio Grande”¹³, which aimed to investigate several health-related behaviors and some chronic diseases. The research protocol was approved by the Ethics Committee of Research on Health from the Federal University of Rio Grande, under process number 20/2016.

The sampling process was carried out in two stages: first, we systematically selected 72 census tracts (a quarter of all in the urban zone), and after we selected an average of 10 households with probability proportional to the tract size, totaling 720 households. Because the mean estimated number of individuals aged 18 years or more per household was two, we expected to find approximately 1,440 individuals. All individuals aged 18 years or more were considered eligible for study¹³.

Data was collected in 2016 by means of a standardized questionnaire. This instrument was administered by face-to-face interviews, at participants households, by trained interviewers. The participants should sign a consent form if they agree to participate in the study. More methodological details of the research can be found elsewhere¹³.

With regards to the socioeconomic evaluation, we used the levels of education (in complete

years in school); family income in the previous month (which was divided into quartiles); and an assets index, that was generated through a principal component analysis (eigenvalue = 3.3; explainability of 30%), considering 11 items of home characteristics or home goods, and further divided into quartiles.

We considered the following indicators : household being registered in the FHS program; a community health worker visit in the previous 12 months; having a health insurance plan; medical consultation in the previous 12 months; dental consultation in the previous six months; dietary counseling in the previous year¹⁴; class with a physical education professional in the previous three months¹⁵; flu vaccine in the previous 12 months; mammography exam and cytopathological exams (for women); and prostate exam (for men).

The mammography target population included women aged 50 to 69 years old and prevalence criteria was at least one exam in the previous two years, according to the Brazilian Ministry of Health¹⁶. The cytopathological exam was targeted to women aged 25 to 64 years old and the prevalence criteria consisted of at least one exam in the previous three years, according to the Brazilian National Institute of Cancer¹⁷. Prostate exam was targeted to men aged 45 years old or more, according to the Urological Society of Brazil¹⁸, and considered at least one exam in the life course. All indicators were coded as binary (yes/no) variables.

For statistical analysis, the sample was first described presenting absolute and relative frequencies and Confidence Interval 95% (95%CI). For all analysis, the indicators were divided in three groups: a) Health services (FHS registration; a community health worker visit in the previous 12 months; having a health insurance plan); b) having contact with health professionals (medical and dental consultation; dietary counseling and participation in class with a physical education professional); and c) specific health interventions (flu vaccine, mammography exam and cytopathological exam for women; and prostate exam for men). Secondly, equiplots were presented to show inequality in prevalence of indicators. These graphs present the prevalence in each subgroup of population and thus the gaps between these groups and inequality structure may be easily visualized¹⁹. We also estimate complex measures of inequality; the Slope Index (SII) as measure of absolute inequality, and the Concentration Index (CIX) as a measure to relative inequality. SII is a complex measure for ordinal dimensions of in-

equality that vary from -100 to 100 with 0 representing equity. Positive values indicate higher prevalence in richer groups and negative values in poorer groups. SII is interpreted in percentage points. CIX indicate if the prevalence of indicator is concentrated and varies from -100 to 100 with 0 representing equity. Positive values indicate concentration of indicator in richer groups and negative values in poorer groups¹⁹. Although we carried out the main analysis with wealth index quartiles, we also present supplementary material containing same analysis with family income and education. Supplementary material includes prevalence of each indicator for each dimension of inequality and values of SII and CIX. Chart 1 shows detailed definition for indicators, stratifiers and inequalities measures. The analyses were performed in Stata 15.1, considering the sample design effect.

Results

Out of 1,429 eligible individuals, 1,300 were interviewed, corresponding to 91% of response-rate. The mean age was 46 years (standard deviation [SD] = 17); the median of schooling level was 11 years (interquartile interval [IQ] = 6 to 13); the median of monthly income per capita was roughly U\$ 250 (IQ = 150 to 440). Regarding the dependent variables, 16.1% of the participants reported having had a class with a physical education professional in the last three months and 80.0% reported at least one medical consultation in the previous year (see TS1, available from: <https://doi.org/10.48331/scielodata.XT3UHH>).

Figure 1 presents proportion of participants who are registered at the FHS, received a visit of community health agents and those covered by private health insurance according to wealth index. While the prevalence of FHS registration and community health agent visits were around 40 and 25 percentage points higher among the poorest compared to the richest group, private health insurance presents an inverse pattern. This indicator was around 40 percentage points higher among those participants belonging to the 25% richest group, compared to the 25% poorest.

Having contact with health professionals according to the wealth index was presented in Figure 2. For all these indicators, the richest group presented the highest prevalence. The indicators medical consultation, with a relatively high prevalence in all groups, and dietary counseling (with low prevalence in all groups) presented lower levels of inequality (Figure 2).

Chart 1. Indicators, stratifiers and inequality measure definitions.

Indicators		Definition	
Health services characteristics	Family Health Strategy registration	Household being registered in the Family Health Strategy program	Is your household registered in the Family Health Strategy?
	Visit of community health agent	Receive a visit of a community health worker in the previous 12 months	Have you received a visit from a community health agent or a member of the Family Health team since last year?
	Private health insurance	Private health insurance	Do you have a private health plan?
Contact with health professional	Dental consultation	Having a dentist consultation in the last six months	When was the last time you went to the dentist?
	Medical consultation	Having a medical consultation in the last 12 months	When was the last time you saw a physician?
	Dietary counselling	Having a dietary counseling in the previous year	Have you received any recommendations on eating habits since last year?
	Class with physical education professional	Having class with physical educator in the last three months	Have you had a class with a physical education professional in the previous three months?
Screening and vaccine	Cytopathologic exam	At least one cytopathologic exam in the previous three years (for women aged 25 to 64 years old)	Have you ever done a uterine cancer screening? How long ago?
	Flu vaccine	Flu vaccine in the previous 12 months	Have you taken the flu vaccine shot this year? Did you take it last year?
	Mammography exam	At least one mammography exam in the previous two years (for women aged 50 to 69 years old)	Have you ever done a mammogram? How long ago?
	Prostate exam	At least one prostate exam at any time (for men aged 45 years old or more)	O Sr. já fez exame de próstata, toque retal ou PSA? Have you ever done a prostate exam?
Stratifier		Definition	
Familiar income	Amount received by all family members in the previous month divided in quartiles. First quartile represents the poorest group and the fourth, the richest		
Wealth index	Take in account characteristics from household (source of drinking water, number of dormitories and number of toilets) and a list of assets (TV, computer, car, internet, telephone, etc). A principal component analysis was carried out and the first component resulting was divided into quartiles. First quartile represents the poorest group and the fourth, the richest		
Education	Completed years of scholarship		

Source: Authors.

The prevalence of medical consultation, dental consultation, dietary counseling, and class with a physical education professional were 5, 25, 10 and 20 percentage points higher in the richest group, compared to the poorest group, respectively.

Figure 3 shows screening exams (cytopathological exam, prostate exam, mammography)

and flu vaccine. The richest present higher prevalence for all indicators in this groups. For cytopathological, mammography, and flu vaccine, the prevalence was around 9-15 percentage point higher in the richest group. Large inequalities were observed in the prostate exam for men (prevalence around 30 percentage points higher in the richest group).

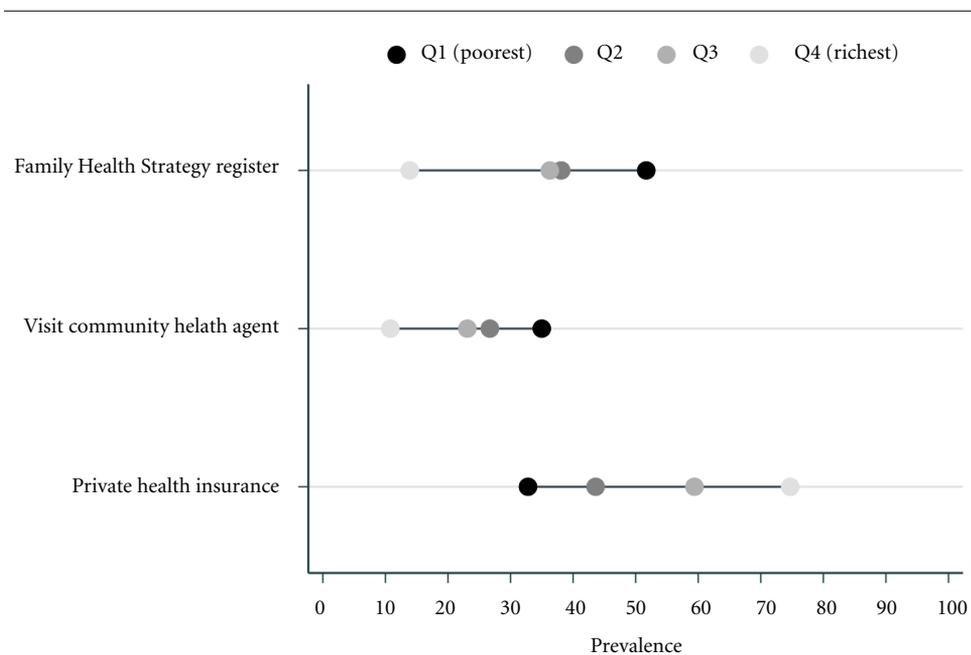


Figure 1. Health services characteristics according to wealth index in adults from Rio Grande/Brazil.

Source: Authors.

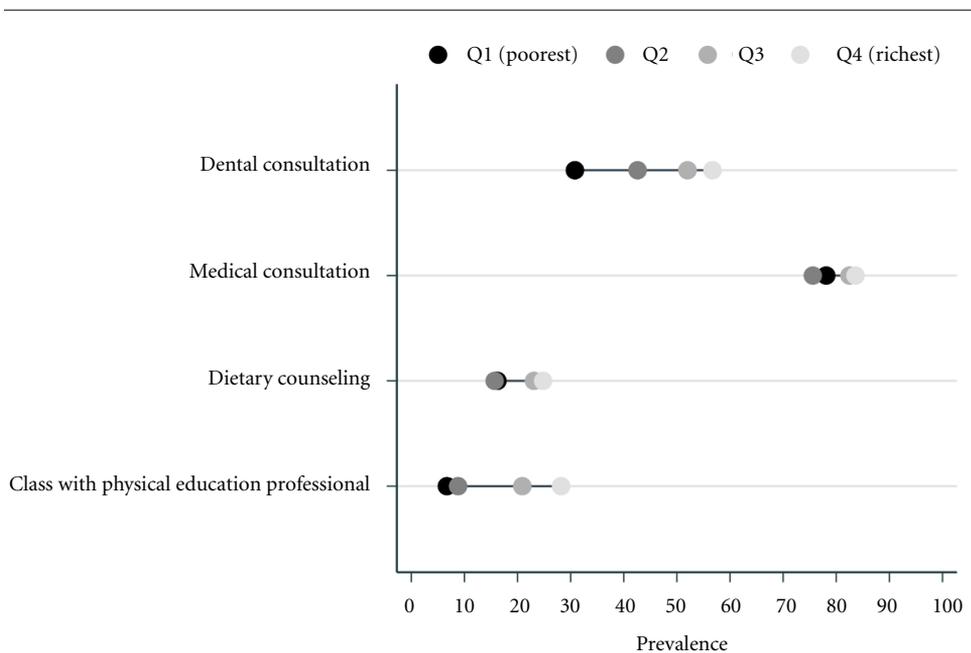


Figure 2. Contact with health professional according to wealth index in adults from Rio Grande/Brazil.

Source: Authors.

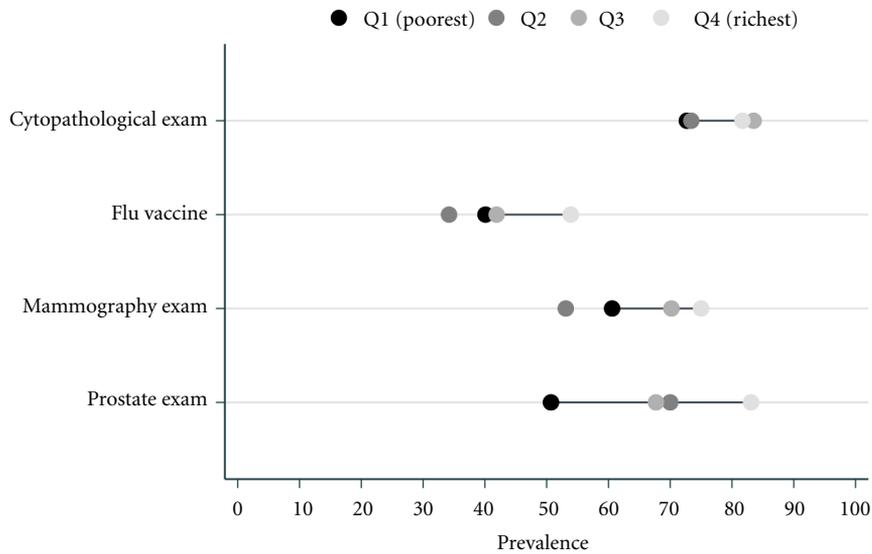


Figure 3. Screening and vaccine according to wealth index in adults from Rio Grande/Brazil.

Source: Authors.

Supplementary Figures (FS1-FS6, available from: <https://doi.org/10.48331/scielodata.XT3UHH>) show prevalence of all indicators according to quartiles of family income and education. The pattern was similar to wealth index for all indicators except to flu vaccine, in which the group with lower education level presented a higher level of vaccination.

Figure 4 shows the relationship between absolute (slope index) and relative (concentration index) inequality, presenting a summary of findings, as well as comparing absolute and relative indices of inequality. There are only two indicators (FHS registration and community health agent visit) presenting higher prevalence among the poorest. The most unequal indicators based on absolute inequality include private health insurance, prostate exam and, dental consultation. Participating in classes with physical education professionals was the most unequal indicator based on the relative inequality measure.

Discussion

Inequalities in the indicators related to health services, contact with health professionals, screening, and flu vaccination were presented using three different socioeconomic dimensions of inequality in a medium size Southern city of

Brazil. For the majority of the indicators pro-rich patterns were identified, in which the richest group presented higher prevalence compared to the poorer groups. Having contact with physical education professionals was the indicator with higher relative inequality (CIX), while private health insurance presented the highest absolute inequality (SII). Households covered by the FHS and receiving a community health agent visit were the only two assessed indicators which presented a pro-poor pattern.

To explore inequalities in health service in medium sized cities and non-capitals is a relevant exploration approach. Vast urban centers may accumulate opportunities and jobs but also risks to health and inequalities²⁰. While large cities concentrate inequalities, Brazil is a country with huge cultural diversity and with important differences in city structures in health services. A recent study has shown that, for example the coverage of Family Strategy program in the country may vary reaching 64.7% in the Northeast while in the Southeast is only 46%²¹. The authors also highlighted the differences between coverage in capitals and interior-cities. In the state of Rio Grande do Sul, the program coverage was 49.5% and in the state capital (Porto Alegre), 52.2%²¹. These differences in coverage of the program may reflect other characteristics of access to health care in the country. In addition, another

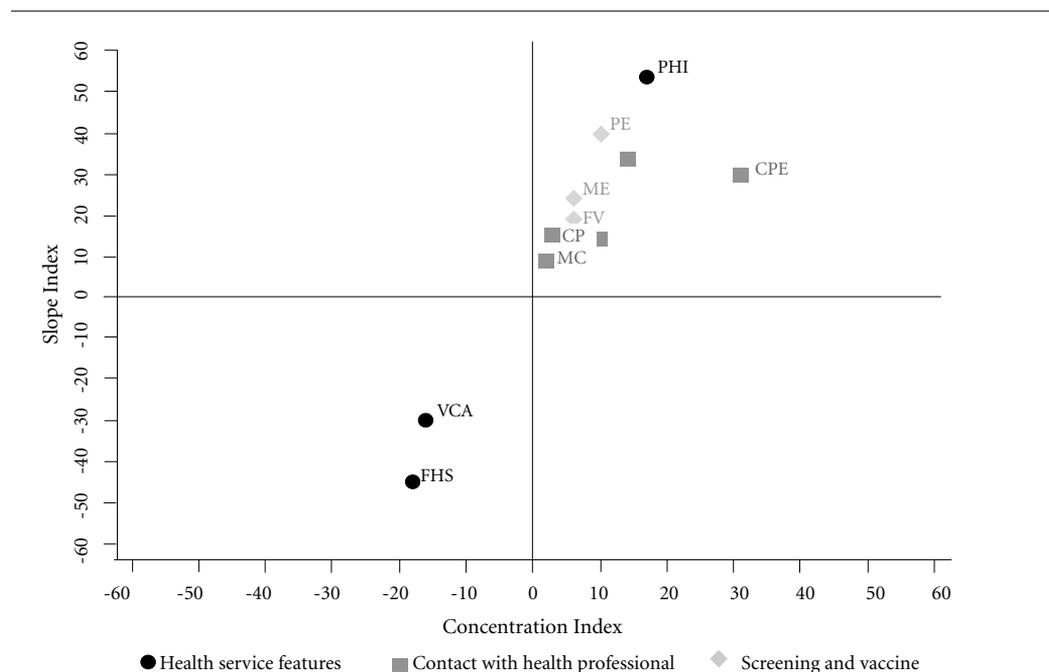


Figure 4. Relationship between slope index and relative index for health services features, contact with health professional, screening and vaccine in adults from Rio Grande/Brazil.

FHS: Family Health Strategy registration; VCA: visit of community health agent; PHI: private health insurance; DeC: dental consultation; MC: medical consultation; DiC: dietary counseling; CPE: class with physical education professional; CP: cytopathological exam; FV: flu vaccine; MM: mammography; PE: prostate exam.

Source: Authors.

study found that human development index for income and longevity of cities is positively associated with the utilization of dental services²². Thus, the exploration of health care inequalities in medium and small sized cities is relevant to understand the country as a whole.

In addition to inequality measures, it is also relevant to highlight the lower prevalence for some indicators. Prevalence for FHS registration, community health agent visit, dental consultation, dietary counseling, class with a physical education professional, and flu vaccination did not reach 50% of the population. The fact these indicators were not close to 50% is a public health problem to be tackled as the overall prevalence is not high at all. By observing these indicators according to wealth quartiles, we noticed a prevalence of less than 10% for consultation with physical educators and of only 30% for dental consultation in the poorest group. The focus on underprivileged groups is likely to be a sound strategy to improve overall prevalence^{2,19,23}.

On the other hand, households with FHS registration and a community health agent's visit were

the indicators with higher prevalence among the poorest group. This finding was expected because this program, created in 1994 in Brazil, aimed to improve health care for low-income families²⁴. Neves et al. showed that FHS prevalence increased in most parts of Brazil's federative units in the period from 2006 to 2016²⁵. However, one of the challenges of the strategy nowadays is expanding to populations other than the poorest since it does not reach the middle-upper income families²⁴. Instead of a problem, it contributes to the equity of the system. However, if, on the one hand, the greater use of public services for the population with greater social vulnerability shows a tendency towards equity, on the other hand, FHS remains considered by some as "medicine for the poor"²⁶. Some authors also refer to a selective universalization process, focusing on primary care services for the most vulnerable groups and specialized care for the richest, reinforcing a class character associated with the concept of primary health care^{27,28}. The historic lack of public investment in the Brazilian Unified Health System – public expenditure lower than other similar international health

systems – and the recent austerity measures have limited the strengthening and expansion of FHS as well as compromising even further the provision of more complex health care, impacting the integrality of the system²⁹.

The most significant inequalities were observed among the indicators of participation in activities with a physical education professional and private health insurance ownership. The latter is easy to understand, as it is directly related to individuals' purchasing power. Furthermore, a literature review has shown that individuals with health insurance are doubled covered by public and private services using the Brazilian Unified Health System when insurances do not cover the type of service required or use hospitals financed by the public sector³⁰. The indicator consulting a physical education professional tends to present a much lower prevalence among the poorest groups, even with the recent increase in the access to this professional by the public health system due to its inclusion in some policies of the Brazilian Unified Health System. Another study carried out in the same municipality found that only 16% of the adult and the elderly had contact with physical education professionals in the last three months. The authors stressed the non-democratic access to these professionals, being a privilege of few population groups, only those with higher education and wealth index¹⁵. Although physical activity may be performed in other situations or even without a professional, the availability in public sectors is still scarce. For the most part, the individuals need to pay for this service resulting in a barrier to the poorest group³¹.

Another indicator that demonstrated significant inequality in favor of the richest was dental consultation. The Brazilian government implemented the National Oral Health Policy (PNSB) to reduce inequities in oral health in 2004, expanding dental care in the Unified Health System³². However, it does not seem to have contributed significantly to reducing inequity in access in the studied municipality. The use of this service network enabled the user to provide more comprehensive care, but studies still report low supply and difficulty in accessing this service^{33,34}. Inequalities in the use of oral health services are identified even among public service users at different assistance levels. A Brazilian study on the use of public services showed a focus on primary care for the poorest and specialized care for the richest, who possibly have more power to break access barriers³³.

Socioeconomic conditions seem to have a direct relationship with health indicators. In this

sense, the “The Inverse Care Law”, published in 1971, is a persistent scenario mainly in low- and middle-income settings. The Inverse Care Law emphasizes that the ones who are in most need for healthcare, are exactly those less likely to receive it: the poorest and most vulnerable population³⁵. A study in a nearby city investigated inequalities in access and quality of health care services. According to social class and education, the study did not find significant differences in the use of health care services. On the other hand, waiting periods of 5 or more days for assistance and waiting time in line equal to or greater than 1 hour were both more frequent in lower social positions and lower education groups³⁶. This fact may help to understand that sometimes the quality of the services may be more affected than the access depending on the social position. Still, Brazil's current austerity policies freezing Brazilian Unified Health System funding have caused increased private health spending by families, accentuating inequalities³⁷. Monitoring of these inequalities is even more relevant in this scenario.

Our study has shown the relationship between absolute and relative measures. We have identified differences in more unequal indicators using absolute and relative measures. None of the measures is better than the other, and both present advantages and limitations. Thus, it is important to show both measures to demonstrate the entire scenario of inequality. Considering the different limitations of inequality measures, some authors recommend using more than one measure, and preferably at least one absolute and one relative measure³⁸. Highlighting this statement, we also found in this study that the most unequal indicators are different when using relative or absolute measures. For example, in this study, the prevalence of having a private insurance plan was 33% in the poorest group and 75% in the richest. The prevalence in the poorest and richest groups was 7% and 28% for classes with physical education professionals, respectively. Although private health insurances have a higher prevalence in the richest group in absolute terms (percentage points), we can see a very relevant relative difference for classes with physical education professionals because the prevalence is small for all groups in this indicator. In mathematic terms, the measures are different, and evaluate both is very important because an indicator not considered as a priority by one measure may be by another.

Another relevant point in this study is the use of different stratifiers for inequalities. Although family income, wealth index, and education may reflect the same idea, they also present different

mechanisms for inequalities³⁹. For example, education may be related to information, income to amount of family resources and wealth index to living standards^{39,40}. In our study, for most findings, the inequalities were consistent across the stratifier groups confirming the patterns for different dimensions of inequality.

We would like to highlight that the results of this study represent the reality of a medium-sized city located in the Southern region of Brazil, and we may extrapolate these findings to other cities in the region. The South and Southeast regions of Brazil are known for having greater coverage of health services, better indicators, and lower inequalities in health than other regions of the country⁴. Therefore, we assume that in other places, inequality in access to health services, as evidenced by this study, might be even more severe.

We should consider a few limitations of this study. All information was self-reported, and the analysed outcomes required different recall peri-

ods from respondents, which may have affected each outcome differently. Additionally, we did not ask the reasons for not seeking health services from those who reported not doing so. On the other hand, it is also worth noting that this is a population-based study, rare in small cities, that investigated several outcomes and three different socioeconomic indicators as dimensions of inequality.

In general, we observed a low prevalence/coverage for indicators related to health service access. Besides, inequalities were identified for the vast majority of health indicators with a pro-rich pattern. Such inequalities must be considered to improve coverage, mainly in the most vulnerable groups of society. Strategic programs created by the government have been collaborating to improve health assistance in the most impoverished communities. However, this assistance has been restricted to this group, not reaching a larger part of the society.

Collaborations

SC Dumith and I Crochemore-Silva conceived and designed the analysis; SC Dumith collected the data; A Wendt and LP Marmitt performed the analysis. A Wendt, LP Marmitt, SC Dumith, I Crochemore-Silva and BP Nunes wrote the paper, carried a critical review, and approved the final version.

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