



Health services utilization by older adults in rural and urban areas of Brazil

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Abstract

Objective: To assess health services utilization by older adults in urban and rural areas of Brazil. **Method:** A cross-sectional study was conducted analyzing data from the 2019 National Health Survey on older adults (≥ 60 years) selected from households based on 22,728 interviews (3,300 in rural and 19,426 in urban areas). For rural and urban areas, the prevalence of Family Health Strategy enrolment, time since last medical and dental visit, service use in past 2 weeks, and last blood pressure and blood glucose measurements were estimated. Also, the factors associated with medical and dental health services utilization in the past 12 months were explored. **Results:** Self-rated health of “Very good” or “Good” was greater in urban areas (47.32%), as was the proportion of older adults reporting a medical or dental visit within the last 12 months (90.54%). Rates of blood pressure (81.30%) and glucose (45.83%) monitoring were lower in rural areas. Older individuals that had low education, resided in rural areas, and the North region, had a lower likelihood of using health services. **Conclusion:** The older population living in rural areas had poorer health status compared with the urban population.

Keywords: Older adult health. Health service utilization. Rural population health. Epidemiological surveys.

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INTRODUCTION

The older population has inherent specificities, such as a higher prevalence of chronic diseases and functional decline, and requires organized care provision that differs to other age groups, placing greater demands on health systems¹⁻³. In response to this need, the National Health Policy for Older Adults (PNSPI)⁴ aims to provide the Brazilian older population with adequate quality health care. Thus, geriatric and gerontology services must address the specific needs of older adults, tailoring care to the peculiarities of this age group and adapting them to the sociocultural context of users.

This older patient group cites distance, waiting times and shortage of places as the main barriers to accessing health services, particularly in rural areas⁵⁻¹². The literature shows that the way people perceive the availability of health services influences decisions on seeking them, where geographical, financial, organizational and cultural barriers, among others, facilitate or obstruct people's ability to utilize health services¹³.

Health inequities in rural and urban populations are a global phenomena^{14,15}. Rural populations exhibit, besides poorer access to health services, albeit medical or dental, poorer living conditions and health status compared to urban populations. Rural communities also have a greater proportion of low-income families, higher illiteracy rates, and a greater incidence of neglected diseases¹⁶⁻¹⁸.

Information on the use of health services by older individuals is important for planning and assessment, helping to inform the reformulation of public policies and actions toward maintaining functional capacity and well-being in later life. In addition, this knowledge can contribute to organizing care for older users which takes account of their needs

and specificities according to the territory in which they reside, albeit urban or rural^{12,19}. These factors warrant the present study investigating general health service utilization by older adults in urban and rural areas of Brazil.

METHOD

A study was conducted which analyzed macrodata from the 2019 National Health Survey (PNS), a cross-sectional population-based national survey carried out by the Brazilian Ministry of Health in collaboration with the Brazilian Institute of Geography and Statistics (IBGE). The PNS is representative of the Brazilian population, macroregions, Federal Units (States), capital cities and their metropolitan regions, and also provides a basis for estimates of urban and rural areas in the country²⁰.

The sampling of the 2019 PNS was performed by conglomerate in three stages: census sectors, permanent private households, and one dweller aged ≥ 15 years randomly selected from each household, while households located in special or sparsely populated census sectors were excluded²⁰. The present study included all dwellers aged ≥ 60 years identified at the third stage of sample selection, based on a total of 22,728 interviews, comprising 3,300 rural residents and 19,426 urban residents.

The variables analyzed included sociodemographic characteristics of the participants: age, sex, race/skin color, literacy and years of formal education successfully completed. With regard to health services use, variables were selected from 3 blocks of questions on the PNS: modules B (Household Visits by Family Health Team and Endemic Agents), J (Health Service Utilization) and Q (Chronic Diseases), as outlined in Chart 1.

Chart 1. Variables used for analysis, extracted from the 2019 National Health Survey (PNS).

Module	Variable	Response options
B – Household Visits by Family Health Team and Endemic Agents	B1. Is your household registered with the Family Health Unit?	1. Yes 2. No 3. Does not know
J - Health Services Utilization	J1 – Overall, how would you rate your health status?	1. Very good 2. Good 3. Fair 4. Poor 5. Very poor
	J11a. When was the last time you saw a doctor?	1. < 1 year ago 2. 1-2 years ago 3. 2-3 years ago 4. >3 years ago 5. Has never been to the doctors
	J13a. When was the last time you saw a dentist?	1. < 1 year ago 2. 1-2 years ago 3. 2-3 years ago 4. >3 years ago 5. Has never been to the dentists
	J14. In the past 2 weeks, have you sought a health unit, service or professional for your own care?	1. Yes 2. No
	J17a. During this first attempt to see a health profession for this problem in the past two weeks:	1. visit was scheduled for another day/place 2. I was not seen. 3. I was seen
Q – Chronic Diseases	Q1a. When was the last time you had your blood pressure taken?	1. <6 months ago 2. 6-12 months ago 3. 1-2 years ago 4. 2-3 years ago 5. > 3 years ago 6. never
	Q29a. When was the last time you had a blood test to measure glucose level, i.e. blood sugar?	1. <6 months ago 2. 6-12 months ago 3. 1-2 years ago 4. 2-3 years ago 5. >3 years ago 6. never

For each variable, mean values or prevalence rates were estimated for rural and urban areas, together with their respective 95% confidence intervals (95%CI), considering the sample design and sample weightings of the survey (*svy* command). The estimates of outcomes for self-rated health and health service use were compared for area of residence using 95%CI. Lastly, logistic regression analyses were performed to assess the association of residence situation with the health services utilization

outcomes medical and dental health care in last 12 months, estimating crude and adjusted odds ratios (OR) for the other covariables. All statistical analyses were carried out using the software package Stata SE, version 17.0, licensed to author Fernando José Herkrath. The level of significance adopted was 0.05.

The 2019 PNS was approved by the National Board of Research Ethics (permit no.3.529.326) and the microdata are available online for public access and use from <https://www.ibge.gov.br/estatisticas/>

sociais/saude/29540-2013-pesquisa-nacional-de-saude.html?edicao=9177&t=microdados.

DATA AVAILABILITY

The complete dataset underpinning the results of the present study is available upon request from the corresponding author Gleica Soyan Barbosa Alves.

RESULTS

The majority of the older respondents of the 2019 PNS lived in urban areas (85.5%). Most of the rural population lived in the Northeast region,

while the urban population was predominantly in the Southeast. A gender difference for area of residence was identified, with a predominance of males in rural areas and females in urban areas. No age difference for area of residence was evident, where mean age of older respondents was around 70 years. With regard to race/skin color, rural areas had a higher proportion of residents who self-identified as brown, whereas urban areas had a higher proportion of white and yellow individuals. There was also a higher proportion of illiterate individuals in rural areas, while the average number of formal years of education successfully completed was also lower in the rural region. The sociodemographic characteristics of the older population studied according to area of residence are outlined in Table 1.

Table 1. Sociodemographic characteristics of older population interviewed in 2019 PNS, according to area of residence.

Variables	Rural	Urban
Region of residence, % (95%CI)		
North	9.19 (8.42-10.02)	5.56 (5.43-5.69)
Northeast	47.81 (45.98-49.65)	21.56 (21.23-21.89)
Southeast	21.08 (19.32-22.95)	50.75 (50.44-51.07)
South	17.00 (15.67-18.43)	15.52 (15.28-15.75)
Mid-West	4.92 (4.23-5.72)	6.62 (6.49-6.74)
Sex, % (95%CI)		
Male	53.96 (52.07-55.86)	41.51 (41.19-41.83)
Female	46.04 (44.14-47.93)	58.49 (58.17-58.81)
Age, mean (95%CI)	70.28 (69.96-70.62)	69.78 (69.59-69.98)
Race/skin color, % (95%CI)		
White	36.76 (34.73-38.83)	52.85 (51.60-54.09)
Black	10.74 (9.42-12.22)	10.20 (9.47-10.97)
Yellow	0.38 (0.21-0.70)	1.43 (1.14-1.80)
Brown	51.71 (49.43-53.98)	34.96 (33-82-36.11)
Indigenous	0.40 (0.24-0.65)	0.56 (0.42-0.75)
Ignored or not informed	0.01 (0.00-0.06)	-
Can read and write, % (95%CI)		
Yes	57.97 (55.82-60.09)	85.35 (84.46-86.19)
No	42.03 (39.91-44.17)	14.65 (13.81-15.54)
Years of formal education, mean (95%CI)	3.11 (2.97-3.25)	7.31 (7.17-7.45)

95%CI, 95% confidence interval

The variables associated with health services use by the older population are presented in Table 2. The proportion of respondents reporting Very good or Good self-rated health was greater in urban residents (49.1%; 95%CI=47.8-50.4) compared to rural residents (36.6%; 95%CI=34.5-38.8). Similarly, the proportion of respondents that reported a medical and dental visit within the last 12 months was also higher in the urban group. The percentage of respondents that reported never having seen a dentist was 5.8% (95%CI=4.7-7.2) in the rural population compared with 1.4% (95%CI=1.1-1.7) in urban residents. However, among respondents who had sought health care services within the past 2 weeks, 77.1% (95%CI=73.5-80.4) of rural residents were able to see a health professional the same day versus 66.7% (95%CI=64.6-68.8) of urban patients.

Also, rates of blood pressure and blood glucose monitoring proved lower in rural areas. More specifically, 4.1% (95%CI=3.3-4.9) of rural respondents reported having blood pressure measured >3 years

previous or never having measured it, compared with 2.4% (95%CI=2.1-2.8) of urban residents. This disparity was even greater for blood glucose testing, with rates of 17.5% (95%CI=16.0-19.1) in the rural area versus 7.5% (95%CI=6.9-8.1) in the urban area.

The results of logistic regression analyses of factors associated with last medical and dental visits among the older population are presented in Tables 3 and 4, respectively. Residing in a rural area and in the North region, being of male gender, having brown skin, lower educational level and better self-rated health, were factors statistically associated with a lower likelihood of having seen a doctor in the 12 months leading up to interview. The factors significantly associated with lower likelihood of having seen a dentist within this same period were living in a rural area and in the North region (relative to Southeast, South or Mid-West regions), higher age, declaring as black, brown or indigenous, having lower educational level, household registered with the ESF, and not rating overall health as Very Good.

Table 2. Aspects associated with self-rated health and health services use among older adults in Brazil, according to area of residence, 2019.

Variables	Rural % (95%CI)	Urban % (95%CI)
Household registered with ESF		
Yes	78.81 (76.65-80.89)	58.96 (57.33-60.56)
No	13.43 (11.76-15.28)	30.86 (29.38-32.38)
Does not know	7.77 (6.44-9.33)	10.18 (9.40-11.01)
Self-rated health		
Very good	3.65 (3.03-4.38)	8.67 (7.99-9.38)
Good	32.95 (30.93-35.03)	40.45 (39.22-41.68)
Fair	49.03 (46.87-51.18)	40.25 (39.00-41.51)
Poor	12.06 (10.70-13.55)	7.94 (7.36-8.56)
Very poor	2.31 (1.52-3.47)	2.69 (2.28-3.15)
Last medical consultation		
<1 year ago	81.76 (80.20-83.21)	90.54 (89.86-91.18)
1-2 years ago	7.83 (6.96-8.80)	4.93 (4.46-5.43)
2-3 years ago	2.95 (2.36-3.67)	1.40 (1.17-1.67)
> 3 years ago	6.72 (5.74-7.84)	2.95 (2.59-3.34)
Never been to doctor	0.74 (0.50-1.08)	0.18 (0.11-0.26)

to be continued

Continuation of Table 2

Variables	Rural % (95%CI)	Urban % (95%CI)
Last dental consultation		
<1 year ago	19.18 (17.65-20.79)	37.48 (36.15-38.82)
1-2 years ago	9.22 (8.04-10.56)	13.14 (12.37-13.95)
2-3 years ago	6.69 (5.72-7.79)	8.29 (7.65-8.97)
> 3 years ago	59.08 (56.79-61.33)	39.72 (38.39-41.05)
Never been to dentist	5.83 (4.73-7.15)	1.36 (1.11-1.67)
Sought health services in last 2 weeks		
Yes	22.20 (20.38-24.11)	30.64 (29.51-31.77)
No	77.80 (75.88-79.62)	69.36 (68.22-70.48)
Outcome of health care services sought in last 2 weeks		
Scheduled for another date/place	20.89 (17.72-24.45)	30.96 (28.90-33.08)
Was not seen	1.99 (1.18-3.33)	2.31 (1.81-2.93)
Was seen	77.12 (73.48-80.38)	66.73 (64.57-68.82)
Last blood pressure reading		
< 6 months	81.30 (79.54-82.93)	84.69 (83.77-85.55)
6 -12 months	8.62 (7.56-9.80)	8.40 (7.77-9.06)
1-2 years	4.64 (3.89-5.51)	3.54 (3.09-4.04)
2-3 years	1.37 (0.97-1.93)	0.96 (0.72-1.27)
> years	3.20 (2.56-3.98)	1.80 (1.53-2.12)
Never	0.87 (0.54-1.38)	0.62 (0.44-0.87)
Last blood glucose test		
< 6 months	45.83 (43.61-48.06)	61.01 (59.85-62.15)
6 -12 months	18.26 (16.78-19.83)	19.04 (18.12-19.99)
1-2 years	13.38 (12.10-14.76)	9.46 (8.81-10.15)
2-3 years	5.05 (4.22-6.04)	3.03 (2.62-3.50)
>3 years	11.13 (9.99-12.38)	5.68 (5.17-6.22)
Never	6.34 (5.41-7.42)	1.78 (1.46-2.14)

95%CI, 95% confidence interval

Table 3. Factors associated with medical visit within last 12 months among older adults in Brazil, 2019.

Variable	Crude OR (95%CI)	Adjusted OR(95%CI)
Area of household (ref. Urban)		
Rural	0.47 (0.41-0.53) ***	0.61 (0.53-0.70) ***
Region of residence (ref.: North)		
Northeast	1.30 (1.09-1.54) **	1.26 (1.05-1.51) *
Southeast	2.42 (2.00-2.94) ***	2.19 (1.79-2.69) ***
South	2.04 (1.64-2.53) ***	1.95 (1.53-2.47) ***
Mid-West	1.47 (1.17-1.86) **	1.43 (1.12-1.82) **
Sex (ref.: Male)		
Female	2.05 (1.81-2.33) ***	1.88 (1.65-2.14) ***
Age	1.03 (1.02-1.03) ***	1.03 (1.02-1.04) ***

to be continued

Continuation of Table 3

Variable	Crude OR (95%CI)	Adjusted OR(95%CI)
Race/skin color (ref.: White)		
Black	0.84 (0.67-1.04)	0.95 (0.74-1.21)
Yellow	1.49 (0.78-2.84)	1.46 (0.76-2.82)
Brown	0.68 (0.60-0.78) ***	0.85 (0.73-0.99) *
Indigenous	0.59 (0.29-1.22)	0.63 (0.31-1.30)
Can read and write (ref.: Yes)		
No	0.68 (0.59-0.77) ***	-
Years of formal education		
	1.03 (1.02-1.04) ***	1.04 (1.03-1.06) ***
Household registered with ESF (ref.: Yes)		
No	1.16 (0.99-1.37) ^a	0.97 (0.82-1.16)
Does not know	0.88 (0.72-1.08)	0.81 (0.65-0.99) *
Self-rated health (ref.: Very good)		
Good	1.22 (0.99-1.49) ^a	1.44 (1.16-1.79) *
Fair	2.05 (1.67-2.53) ***	2.91 (2.32-3.65) ***
Poor	3.77 (2.80-5.08) ***	5.81 (4.28-7.89) ***
Very poor	8.46 (4.91-14.57) ***	11.66 (6.70-20.27) ***

OR, odds ratio; 95%CI, 95% confidence interval ^a p<0.10; * p<0.05; ** p<0.01; *** p<0.001**Table 4.** Factors associated with dental visit within last 12 months among older adults in Brazil, 2019.

Variable	Crude OR (95%CI)	Adjusted OR (95%CI)
Area of Household (ref.: Urban)		
Rural	0.40 (0.35-0.44) ***	0.79 (0.69-0.89) ***
Region of residence (ref.: North)		
Northeast	0.99 (0.86-1.14)	1.12 (0.96-1.31)
Southeast	2.29 (1.97-2.66) ***	1.59 (1.34-1.87) ***
South	1.97 (1.69-2.30) ***	1.55 (1.30-1.85) ***
Mid-West	1.50 (1.26-1.79) ***	1.23 (1.01-1.49) *
Sex (ref.: Male)		
Female	1.00 (0.92-1.10)	-
Age		
	0.96 (0.95-0.96) ***	0.97 (0.97-0.98) ***
Race/skin color (ref.: White)		
Black	0.53 (0.44-0.64) ***	0.76 (0.62-0.93) **
Yellow	1.15 (0.73-1.81)	0.98 (0.62-1.54)
Brown	0.53 (0.48-0.59) ***	0.83 (0.74-0.94) **
Indigenous	0.31 (0.19-0.51) ***	0.44 (0.26-0.75) **
Can read and write (ref.: Yes)		
No	0.25 (0.22-0.29) ***	-
Years of formal education		
	1.17 (1.16-1.78) ***	1.13 (1.11-1.14) ***
Household registered with ESF (ref.: Yes)		
No	2.02 (1.81-2.27) ***	1.26 (1.12-1.42) ***
Does not know	1.51 (1.29-1.76) ***	1.05 (0.89-1.23)

to be continued

Continuation of Table 4

Variable	Crude OR (95%CI)	Adjusted OR (95%CI)
Self-rated health (ref.: Very good)		
Good	0.57 (0.48-0.86) ***	0.74 (0.63-0.88) **
Fair	0.34 (0.29-0.41) ***	0.64 (0.54-0.77) ***
Poor	0.23 (0.18-0.29) ***	0.52 (0.41-0.66) ***
Very poor	0.23 (0.15-0.33) ***	0.52 (0.34-0.80) **

OR, odds ratio; 95%CI, 95% confidence interval; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

DISCUSSION

The study findings revealed that the older population living in rural areas of Brazil were disadvantaged with regard to the use of health services compared with their urban counterparts. Although the majority of households were registered with the Family Health Strategy (ESF) (Primary Care clinics), the proportion of older respondents that reported having seen a doctor or dentist in the 12 months leading up to interview was lower in rural areas. Similarly, the rate of blood pressure monitoring and blood glucose testing was also lower in the rural population. Despite the overall poorer self-rated health of rural residents, a lower proportion of this group reported seeking health services within the past 2 weeks. However, a higher proportion of rural older adults that sought health services reported being seen the same day compared to patients from urban areas. Health service use was found to be associated with area of residence (rural/urban), region of residence, sex, age, race/skin color, years of formal education, registration with ESF, and self-rated health.

Negative self-rated health is a factor that appears to influence mortality risk⁵ with typically poorer ratings among low-educated individuals and those with a greater number of chronic diseases²¹. Evidence also suggests that people with fewer years of formal education make less use of health services, despite having a worse health status¹³.

Occupational aspects, besides a higher prevalence of males and low-educated individuals in the rural population, might also explain this lower propensity

to seek health services. Studies have shown that self-reported health status is worse among those living in rural than in urban settings, that men are less likely than women to seek health services, and that the behavior of seeking health services increases with higher educational level^{22,23}.

Geographic dispersion and socioeconomic vulnerability, together with a lack of or inadequate public health policies and shortage of resources dedicated to rural populations, have contributed to the situation of characteristic vulnerabilities of rural areas^{7,15,24,25}. Health-service seeking behavior is lower in rural areas and the rise in rurality has reduced perceived unmet health needs, suggesting different expectations of use among users from rural and urban areas^{22,26}.

The distance between rural communities and health services, coupled with other barriers, leads rural residents to delay longer before seeking health compared to individual livings in urban area^{26,27}. Moreover, lack of reliable transportation services is another factor often cited as a barrier to accessing services, where rural residents weigh up the transportation time, cost and risks, often resorting to community services to resolve health issues, irrespective of type of service offered^{17-9,27-30}.

The literature also reveals that health service use by older patients, in addition to being associated with greater educational level, is linked to the notion of needing to seek health services only for diseases, when falling sick or being diagnosed with a chronic disease^{31,32}. For dental services, use is greater

among older individuals experiencing pain and who recognize the need for treatment and/or a dental prosthesis³³. However, the lower availability of health services and professionals in rural areas, together with the greater barriers to access, explain the lower use of health services by older rural dwellers^{16,18}. Data from the 2013 PNS revealed that, of the older citizens surveyed, 16.5% had not seen a doctor and only 28.9% had seen a dentist within the past year¹. Despite an improvement in these rates in the 2019 PNS (10.3% and 34.8%, respectively), a significantly lower proportion of consultations was evident among older adults from rural areas.

Despite the apparent greater coverage by the ESF and the fact that most consultations were performed on the same day of seeking health services in the rural area, better health status and more frequent use of health services was found in the urban area. These findings underscore the importance of distinguishing coverage of primary care from the construct of access, which incorporates other dimensions, such as barriers encountered by older populations in seeking healthcare^{9,30}.

These findings also reveal the need to expand monitoring strategies for older adults with chronic conditions, especially among those living in rural areas, mainly to address the higher number of older patients seen at primary care services with systemic arterial hypertension and diabetes mellitus³⁴. Studies show that rural communities have major problems involving health infrastructure and staff retention, particularly physicians, contributing to poor access to clinical diagnosis and lack of basic equipment such as sphygmomanometers to measure blood pressure^{7,35}.

Evidence also suggests that older rural residents, despite having poorer health status, tend to delay seeking health services, navigating the numerous barriers to care only when there is a greater likelihood of being seen. This situation can lead to a worsening of the frailer health of the aged population¹⁶. A well organized primary health service can help attenuate inequities in access to health services between rural and urban populations^{18,35}. A previous study found that, in remote rural towns, primary care services were the first port of call for users, and that it was not uncommon for nurses to provide the initial

treatment at public primary care clinics due to a shortage of doctors at these facilities³⁵.

In this context, some specific target groups for priority actions can be elected, such as less-educated individuals and those living in rural areas in the North region of the country. Amid still low population coverage, an increase in the number of oral health teams in the ESF units, which are highly prevalent in these territories, can also help boost the use of oral health services.

This study has some limitations, such as the cross-sectional design which limits the interpretation of the findings. Thus, the associations identified should be interpreted with caution. The distribution of variables between rural and urban areas may be influenced by a survival bias (Neyman bias), expressing the prevalence among survivors at the time of the study, leading to underestimation of the worse health outcomes and of health services use in rural areas. Information bias may also have been present, given that the information obtained in the survey were self-reported by the respondents. However, strengths include the fact that the study assessed representative data from a national household survey, identifying differences in outcomes of health services use by older adults from rural versus urban areas in Brazil.

CONCLUSION

The study findings reveal that the older population living in rural areas of Brazil were disadvantaged with regard to the use of health services compared with their urban counterparts. Better self-rated health was found among older residents of urban areas, along with more regular visits to the doctor and dentist. Rurality was associated with lower likelihood of having seen a doctor or dentist in the 12 months leading up to interview, and also with living in the North region of the country and having a low educational level. Male gender was associated with a lower likelihood of medical visits. Older individuals had a greater probability of using medical services, but a lower chance of using dental services. Race/skin color, registration with the ESF and self-rated health, were also associated with health services use. Strategies for reducing barriers to accessing health

services faced by the rural population in Brazil should be implemented that take account of the specificities of the different rural territories in which they live.

AUTHORSHIP

Gleica Soyan Barbosa Alves – study conception and design; data analysis and interpretation; writing; original draft; and approval of final version for publication.

Rosana Cristina Pereira Parente – study conception and design; writing; review and editing; and approval of final version for publication.

Fernando José Herkrath – study conception and design; formal analysis; resources; programs; supervision; validation; writing; review and editing; and approval of final version for publication.

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