Most prevalent morbidities among older Brazilian adults according to sex, age groups, and major regions

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Abstract

Objective: To identify the most prevalent morbidities among older Brazilian adults in 2013 and 2019 and their percentage variation according to sex and age groups in the country's major regions. *Method:* This cross-sectional study used data from the 2013 and 2019 National Health Survey, including older adults aged 60 years or over who answered the selected resident questionnaire (2013: n=11,177; 2019: n=22,728). Complex sample analyses with sampling weights were performed, estimating prevalences and confidence intervals to ensure the representativeness of the results. Percentage variation was calculated using the formula [(value at the later time ÷ value at the earlier time) − 1] × 100. Associations between variables were assessed using Pearson's chi-square test ($p<0.05$). *Results:* The most prevalent morbidities in both years were hypertension, chronic back problems, hypercholesterolemia, diabetes mellitus, and arthritis or rheumatism. These conditions were more prevalent among younger older adults, females, and residents of the Southeast region. Overall, an increase in the percentage variation of morbidities among older adults was observed across the years analyzed, according to the Brazilian regions, although with important disparities by sex and age groups. *Conclusion:* The distribution of morbidities revealed inequalities according to sex, age groups, and regions, reflecting disparities in the aging process of the Brazilian population. These findings enhance the understanding of regional inequalities and support managers and healthcare professionals in organizing equitable care for older adults, guiding the development of public policies and clinical practice in geriatrics and gerontology.

Keywords: Morbidity. Chronic Disease. Aging. Health of the Elderly. Geriatrics.

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INTRODUCTION

An increase in noncommunicable chronic diseases (NCDs) has been observed among the older population, concurrently with population aging and the epidemiological transition[1]. Noncommunicable chronic diseases are among the leading causes of disability and premature mortality worldwide, accounting for approximately 71% of all deaths. In this context, older adults are the most affected, resulting in significant impacts on their quality of life and generating substantial costs for healthcare systems[2]. In Brazil, in 2019, noncommunicable chronic diseases accounted for more than 734,000 deaths, representing approximately 55% of all deaths in the country[1].

Previous studies have highlighted the importance of investigating the health of older adults, particularly regarding the most prevalent morbidities[3-6]. International[3,4] and national[5,6] research has shown differences according to sex and age groups, with the oldest old (80 years of age or older) women exhibiting higher prevalence of multimorbidity (two or more morbidities in the same individual) when up to 25 diseases and greater life expectancy are considered.

Within the context of Brazil's demographic transition, the older population has increased markedly, especially among those aged 80 years or over, compared with other age groups[7]. This phenomenon has triggered significant changes in morbidity and mortality patterns, with substantial regional diversity influenced by socioeconomic, cultural, and racial disparities, access to healthcare services, urbanization, and other factors[7].

Clarifying potential regional differences is essential for improving understanding and for developing effective strategies aimed at preventing health conditions and organizing healthcare delivery. This enables the recognition of specificities that are often rendered invisible by regional inequalities, contributing to the promotion of health and quality of life among older adults[6].

Few studies have examined the epidemiology of the most prevalent morbidities among older Brazilian adults within a regional framework, particularly considering sex, age groups, and temporal comparisons. This study seeks to address this gap in the literature, as understanding such diversity is essential for formulating more equitable public health policies and for delivering comprehensive healthcare to this population, especially considering Primary Health Care (PHC) as the main entry point into the Unified Health System (SUS)[5,6].

Thus, comparative analysis enables healthcare professionals to identify the most relevant aspects to be addressed in the assessment and monitoring of older adults' health, while also supporting decision-makers in developing or adjusting public policies. Therefore, this study aims to identify the most prevalent morbidities among older Brazilian adults in 2013 and 2019 according to sex and age groups across the country's major regions.

METHODS

This was a cross-sectional study using individual data from the Brazilian National Health Survey (PNS). This is the most comprehensive health survey conducted in Brazil and consists of a nationally representative household-based survey carried out in 2013 and 2019 across the country's major regions. It was developed by the Brazilian Institute of Geography and Statistics (IBGE) in partnership with the Ministry of Health. The methodology of the National Health Survey is internationally validated and allows for statistically rigorous comparison of regional realities in Brazil[8]. This study followed the recommendations of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for reporting observational studies.

The study population consisted of older adults aged 60 years or older residing in all Brazilian states. The sample included older adults who completed the selected resident questionnaire (2013: 11,177; 2019: 22,728). In both editions of the National Health Survey, sampling followed a three-stage cluster design. In the first stage, the primary sampling units were census tracts randomly selected. In the second stage, a random number of households was selected

within each tract, and in the third stage, one resident was randomly selected in each sampled household[8].

Publicly available data were obtained between April and June 2023 from the 2013 and 2019 National Health Survey databases, accessible on the IBGE website.

To assess the most prevalent morbidities, 14 noncommunicable chronic diseases included in both editions of the National Health Survey were considered, according to the survey's specific modules. Morbidities were identified using Module H on noncommunicable chronic diseases. The questions and their respective codes were: hypertension (Q002), diabetes mellitus (Q030), hypercholesterolemia (Q060), heart disease (Q063), cerebrovascular disease (Q068), asthma (Q074), arthritis/rheumatism (Q079), chronic back problem (Q084), work-related musculoskeletal disorder (Q088), depression (Q092), lung disease (Q116), cancer (Q120), and chronic kidney failure (Q124).

The identification of noncommunicable chronic diseases was based on the question: "Has any physician ever given you a diagnosis for this disease?", with dichotomous response options (yes/no). For chronic back pain, the survey relied on participants' self-reports, whereas for depression and mental health, previous diagnoses made by a mental health professional (psychiatrist or psychologist) were considered.

Based on a ranking derived from the prevalence analysis of all morbidities included in both editions of the National Health Survey, the five most prevalent morbidities in Brazil were selected for analysis (hypertension, chronic back problem, hypercholesterolemia, diabetes mellitus, and arthritis or rheumatism), as these accounted for more than 50% of all morbidities among older Brazilian adults.

Sociodemographic variables were drawn from different modules of the National Health Survey. Sex was identified in Module A – General Characteristics of Household Residents, question Q001: "What is your sex?" (male; female). Age was obtained from question Q002 of the same module: "How old are you in completed years?", and categorized into three age groups (60–69, 70–79, and ≥80 years). The region of residence was derived from the geographic location of the household, recorded in the identification and territorial classification block of the questionnaire, following the official IBGE division into five major regions: North, Northeast, Southeast, South, and Central-West. Educational level was obtained from Module C – Education Characteristics, question Q025: "What is the highest level of schooling you attended and completed?", categorized as no schooling, primary education, secondary education, and higher education. Perceived health status was extracted from Module J – Lifestyle and Health Perception, question Q001: "In general, how would you rate your health?" The response options were very good, good, fair, poor, and very poor; for analysis, categories were grouped as very good/good, fair, and poor/very poor.

For sample characterization, two groups of older adults were considered: a younger group (60–79 years) and an older group (80 years or over), following previous research on aging and morbidity distribution[9-13]. Variables were analyzed by sex and age group within the regional context. Considering the complex sampling design, sampling weights for the primary sampling unit, individual, and stratum were applied in all analyses, ensuring the representativeness of data for older Brazilian adults. For sample characterization, categorical variables were presented using relative frequencies (%) and 95% confidence intervals (95% CI). Morbidity prevalences and their respective 95% CIs were estimated according to survey year, sex, and age group across Brazil's major regions.

Associations between variables were analyzed using Pearson's Chi-square test with a 95% confidence level. Associations were considered statistically significant when the p-value was <0.05. Percentage variation was calculated as follows: $[(\text{value at the later time} \div \text{value at the earlier time}) - 1] \times 100$, in accordance with a previous study comparing percentages across the two editions of the National Health Survey[14].

This study used only secondary, public, and anonymized data from the National Health Survey, whose data collection was approved by the National

Research Ethics Commission (CONEP) under opinions Nº 328,159/2013 and Nº 3,529,376/2019, in compliance with National Health Council Resolution Nº 466/12. The present analysis, involving public data with no possibility of participant identification, also complies with the guidelines of National Health Council Resolution Nº 510/2016.

DATA AVAILABILITY

The full dataset supporting the results of this study is publicly available on the National Health Survey website and can be accessed at https://www.pns.icict.fiocruz.br/bases-de-dados/

RESULTS

Table 1 presents the proportional distribution of the relative frequencies of sociodemographic and health-related variables of older adults in 2013 and 2019, as well as the percentage variation for Brazil and its major regions. In both years, higher proportions of women, individuals aged 60-79 years, and those with incomplete primary education were observed in Brazil and in its regions. A greater proportion of very good/good perceived health status was found in the Southeast, South, and Central-West regions, whereas fair perceived health was more prevalent in the North and Northeast regions.

Table 1. Characteristics of older adults in 2013 (N = 11,177) and 2019 (N = 22,728), in percentages and 95% Confidence Intervals (95% CI). National Health Survey, Brazil, 2013 and 2019.

Variables	2013 % (95% CI)	2019 % (95% CI)	Percentage variation
BRAZIL			
Sex			
Female	56.4 (54.8-57.9)	56.7 (55.6-57.7)	0.5
Male	43.6 (42.1-45.2)	43.3 (42.3-44.4)	0.6
Age			
60–79 years	86.4 (87.2-89.5)	86.4 (85.7-87.2)	0
80 years or over	13.6 (12.6-14.7)	13.6 (12.8-14.3)	0
Educational Attainment			
No formal education	22.7 (21.4-24)	16.8 (16-17.7)	-35.1
Incomplete primary education	48 (46.3-49.7)	46.5 (45.3-47.6)	-3.2
Complete primary education or higher	29.3 (26-33.2)	36.7 (34-39.7)	25.2
Self-rated Health Status			
Very good/good	44.4 (42.1-46.8)	47 (45.4-48.9)	5.8
Fair	43.5 (42-45)	41.7 (40.6-42.9)	-4.3
Poor/very poor	12.1 (10.8-13.6)	11.3 (10.3-12.2)	-8
NORTH REGION	4.9 (4.5-5.3)	6.1 (5.8-6.4)	24.4
Sex			
Female	53 (47.3-58.6)	53.7 (51-56.4)	1.3
Male	47 (41.4-52.7)	46.3 (43.6-49)	-1.5
Age			
60–79 years	90.4 (87.5-92.8)	87.2 (85.2-88.9)	-3.6
80 years or over	9.6 (7.2-12.5)	12.8 (11.1-14.8)	33.3

to be continued

Continuation of Table 1

Variables	2013 % (95% CI)	2019 % (95% CI)	Percentage variation
Educational Attainment			
No formal education	27.4 (23.8-31.5)	25 (22.4-27.8)	10
Incomplete primary education	48.6 (43.9-53.2)	46.5 (43.7-49.3)	4.5
Complete primary education or higher	24 (17.5-33.1)	28.5 (23.3-34.9)	18.7
Self-rated Health Status			
Very good/good	35.6 (30-41.7)	39.7 (36.2-43.4)	11.5
Fair	48.2 (43.6-52.8)	47.4 (44.7-50.1)	-1.6
Poor/very poor	16.2 (12.3-21.4)	12.9 (10.9-15.6)	-26.3
NORTHEAST REGION	25.2 (24.1-26.4)	25.4 (24.6-26.2)	0.7
Sex			
Female	55.9 (53.1-58.6)	56.5 (54.7-58.3)	1
Male	44.1 (41.4-46.9)	43.5 (41.7-45.3)	-1.3
Age			
60–79 years	85.1 (83-87.1)	84.2 (82.7-85.6)	-1
80 years or over	14.9 (12.9-17)	15.8 (14.4-17.3)	6
Educational Attainment			
No formal education	39.2 (36.5-42)	34.5 (32.6-36.5)	-13.6
Incomplete primary education	41.6 (38.8-44.5)	40.9 (39-42.8)	-1.7
Complete primary education or higher	19.2 (15.4-23.7)	24.6 (21.5-28.2)	28.7
Self-rated Health Status			
Very good/good	34.7 (31.7-38)	35.1 (32.9-37.5)	1.1
Fair	48.3 (45.7-50.8)	48.8 (47-50.6)	1.2
Poor/very poor	17 (14.6-19.9)	16.1 (14.5-18)	-5.5
SOUTHEAST REGION	48.3 (46.8-49.8)	46.4 (45.4-47.5)	-4
Sex			
Female	57.1 (54.6-59.6)	57.6 (55.7-59.5)	0.8
Male	42.9 (40.4-45.4)	42.4 (40.5-44.3)	-1.1
Age			
60–79 years	85.6 (83.8-87.3)	86.6 (85.3-87.9)	1.1
80 years or over	14.4 (12.7-16.2)	13.4 (12.1-14.7)	-7.4
Educational Attainment			
No formal education	15.5 (13.6-17.5)	9 (7.9-10.2)	-72.2
Incomplete primary education	48.9 (46.1-51.8)	46.4 (44.4-48.3)	-5.3
Complete primary education or higher	35.6 (23-33.1)	44.6 (39.7-50.3)	25.2
Self-rated Health Status			
Very good/good	50.3 (46.3-54.5)	53.5 (50.3-56.7)	0.4
Fair	40.9 (38.5-43.4)	37.5 (35.5-39.5)	-9
Poor/very poor	8.8 (6.9-11.3)	9 (7.5-10.9)	2.2
SOUTH REGION	15.1 (14.2-16)	15.7 (15.1-16.4)	3.9
Sex			
Female	56.8 (52.8-60.7)	55.8 (53.7-57.9)	-1.7
Male	43.2 (39.3-47.2)	44.2 (42.1-46.3)	2.3

to be continued

Continuation of Table 1

Variables	2013 % (95% CI)	2019 % (95% CI)	Percentage variation
Age			
60–79 years	88.6 (86-90.8)	88.2 (86.7-89.6)	-0.4
80 years or over	11.4 (9.2-14)	11.8 (10.4-13.3)	3.5
Educational Attainment			
No formal education	14.7 (12.3-17.6)	8.3 (7-9.8)	-77.1
Incomplete primary education	56.7 (52.7-60.5)	55.3 (52.9-57.7)	-2.5
Complete primary education or higher	28.6 (22.5-36.5)	36.4 (31.1-42.5)	27.1
Self-rated Health Status			
Very good/good	45.6 (40.8-51)	50.5 (47.1-54.3)	10.7
Fair	42.2 (38.8-45.6)	40.2 (37.8-42.6)	-4.9
Poor/very poor	12.2 (9.2-16.2)	9.3 (7.5-11.3)	-31.1
CENTRAL-WEST REGION	6.5 (6-6.9)	6.4 (6-6.7)	-1.5
Sex			
Female	55.1 (51.3-58.9)	55.4 (52.2-58.6)	-0.5
Male	44.9 (41.1-48.7)	44.6 (41.4-47.8)	-0.6
Age			
60–79 years	89.1 (86.8-91.1)	88.9 (86.8-90.7)	-0.2
80 years or over	10.9 (8.9-13.2)	11.1 (9.3-13.2)	1.8
Educational Attainment			
No formal education	25.5 (22.5-28.7)	17 (14.9-19.4)	-50
Incomplete primary education	45.4 (41.7-49.1)	47.3 (44.1-50.4)	3.9
Complete primary education or higher	29.1 (22.6-37.8)	35.7 (29.5-43.3)	22.6
Self-rated Health Status			
Very good/good	43.3 (38.2-49.1)	46.5 (42.1-51.3)	7.3
Fair	43.4 (39.9-47)	42.9 (40-46)	-1.1
Poor/very poor	13.3 (10-17.4)	10.6 (8.5-13.3)	- 24.5

Percentages estimated using sampling weights; V: percentage variation between 2013 and 2019 [(value at the later time ÷ value at the earlier time) − 1] × 100. **Source:** National Health Survey, 2013 and 2019.

Figure 1 shows the proportional distribution of morbidity prevalences among older adults in the major Brazilian regions in 2013 and 2019. The most prevalent morbidities were, respectively: hypertension, chronic back problem, hypercholesterolemia, diabetes mellitus, and arthritis or rheumatism. Morbidities were consistently more prevalent in the Southeast, Northeast, and South regions. Hypertension was the leading chronic condition nationwide, with the highest percentage observed in the Southeast.

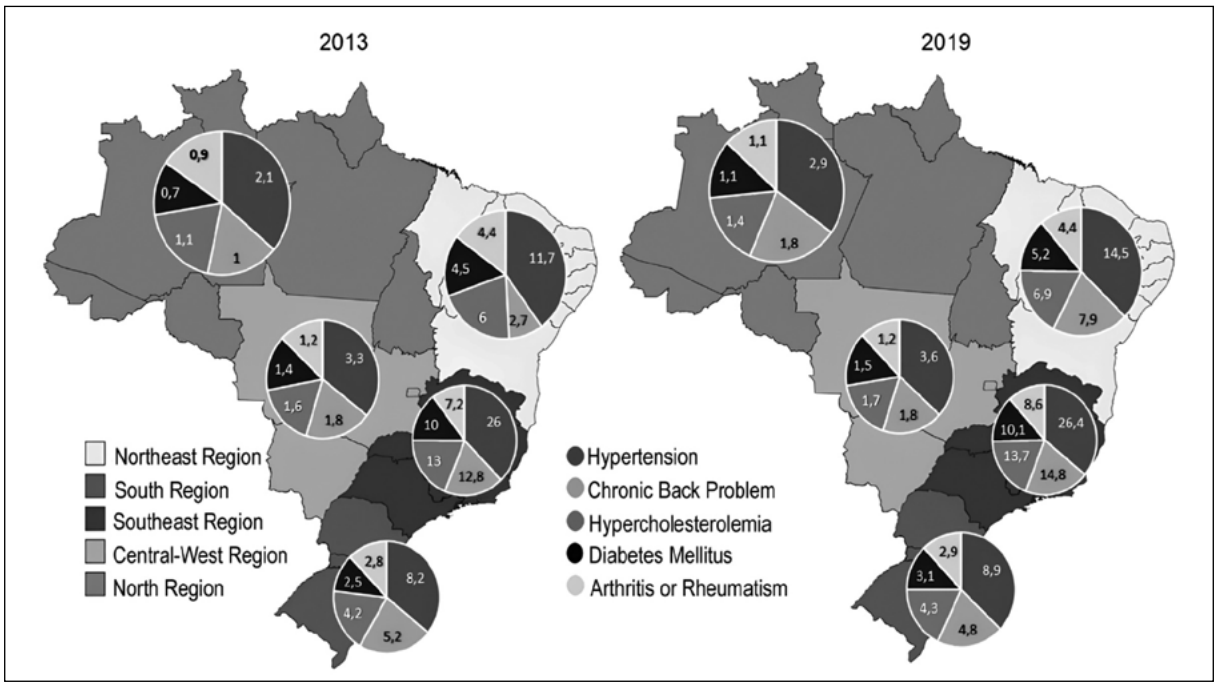

Figure 1. Distribution of morbidity prevalences among older adults in the major Brazilian regions. National Health Survey (2013: n = 11,177; 2019: n = 22,728), Brazil.

According to Table 2, hypercholesterolemia and diabetes mellitus showed significant percentage increases among men, whereas arthritis or rheumatism showed a percentage decrease in Brazil (-19.4%) and across all regions, especially in the Northeast (-40.6%). Conversely, among women, a significant increase in arthritis or rheumatism was observed, followed by chronic back problem and hypertension.

Important differences in percentage variation of morbidities between sexes were observed: in the North, the largest difference was the increase in chronic back problem among men; in the Northeast, hypercholesterolemia increased mainly among men; in the Southeast, arthritis or rheumatism increased among women and decreased among men; in the South, diabetes mellitus increased primarily among women; and in the Central-West, hypertension increased substantially among men. Furthermore, the Southeast and South regions presented percentages of hypertension higher than those observed in Brazil overall, according to sex, in both years.

Regarding age groups (Table 3), the Central-West region showed morbidity percentages higher than those identified in Brazil in both 2013 and 2019, whereas the Southeast and South regions showed higher percentages only in 2013. The greatest percentage variations were found in the increase in chronic back problem among younger older adults and in hypercholesterolemia among the oldest old in the North region. In the Northeast region, a substantial increase in chronic back problem was observed among the oldest old. 60-79 years.

Table 2. Distribution of prevalences and 95% Confidence Intervals (95% CI) of morbidities among older Brazilian adults according to sex and percentage variation between the years 2013 (n = 11,177) and 2019 (n = 22,728) in the major Brazilian regions. National Health Survey, Brazil, 2013 and 2019.

Variables	Male 2013 % (95% CI)	Male 2019 % (95% CI)	V*	Female 2013 % (95% CI)	Female 2019 % (95% CI)	V*	p* 2013	p* 2019
BRAZIL								
Hypertension	19.9 (18.6-21.2)	21.5 (20.6-22.4)	8	31.3 (29.8-32.8)	34.9 (33.9-36)	11.5	<0.001	<0.001
Chronic Back Problem	10.5 (9.5-11.6)	11.1 (10.4-11.7)	5.7	17.6 (15.5-18.9)	20 (19.1-21)	136	<0.001	<0.001
Hypercholesterolemia	7.7 (6.8-8.7)	8.9 (8.2-9.5)	15.5	18.2 (16.9-19.5)	19.1 (18.2-20.1)	4.9	<0.001	<0.001
Diabetes Mellitus	7.4 (6.5-8.4)	8.4 (7.8-9)	13.5	11.8 (10.7-12.9)	12.4 (11.7-13.2)	5	0.021	0.022
Arthritis or Rheumatism	4.3 (3.6-5.1)	3.6 (3.2-4)	-19.4	12.2 (11.2-13.3)	14.6 (13.7-15.5)	19.6	<0.001	<0.001
NORTH REGION								
Hypertension	17 (13.6-21)	19 (17-21.2)	11.7	26.7 (22.3-31.6)	29.3 (26.9-31.9)	9.7	0.013	<0.001
Chronic Back Problem	8.4 (5.9-11.9)	12.8 (11.2-14.6)	52.3	11.6 (8.4-15.7)	16 (14.1-18)	37.9	0.385	0.379
Hypercholesterolemia	7 (5-9.9)	7.3 (6.1-8.7)	4.2	15.6 (11.9-20.1)	16.9 (15-19)	8.3	0.008	<0.001
Diabetes Mellitus	5.2 (3.2-8.3)	7 (5.8-8.5)	34.6	10.6 (7.7-14.4)	10.7 (9.2-12.5)	0.9	0.049	0.072
Arthritis or Rheumatism	6 (3.7-9.7)	5 (4-6.4)	-20	13.2 (10.2-17)	13.7 (12.1-15.5)	3.7	0.006	<0.001
NORTHEAST REGION								
Hypertension	16.1 (14.2-18.1)	21.4 (20-22.9)	32.9	30.5 (28-33.1)	35.9 (34.2-37.5)	17.7	<0.001	<0.001
Chronic Back Problem	11.2 (9.6-13.2)	11.6 (10.5-12.8)	3.5	17.4 (15.4-19.7)	19.4 (17.9-21.1)	11.4	0.036	<0.001
Hypercholesterolemia	5.4 (4.3-6.6)	7.8 (6.8-8.9)	44.4	19.7 (17.7-21.9)	19.9 (18.5-21.3)	1	<0.001	<0.001
Diabetes Mellitus	5.7 (4.5-7.2)	7.4 (6.6-8.4)	29.8	12.9 (10.9-15.2)	13.2 (12.1-14.5)	2.3	0.001	<0.001
Arthritis or Rheumatism	4.5 (3.4-5.9)	3.2 (2.7-3.9)	-40.6	13 (11.2-15)	14.1 (12.9-15.5)	8.4	<0.001	<0.001
SOUTHEAST REGION								
Hypertension	21.7 (19.5-24.1)	21.6 (20-23.2)	-0.4	31.8 (29.4-31.4)	35.1 (33.3-37)	10.3	0.052	<0.001
Chronic Back Problem	9.5 (7.9-11.4)	10.6 (9.5-11.8)	11.5	17 (15-19.1)	21.2 (19.6-23)	24.7	0.005	<0.001
Hypercholesterolemia	8.5 (7-10.4)	9.3 (8.2-10.5)	9.4	17.7 (15.7-20)	19.8 (18.2-21.5)	11.8	<0.001	<0.001
Diabetes Mellitus	8.4 (6.9-10.1)	9.1 (8-10.3)	8.3	11.8 (10.2-13.8)	12.4 (11.2-13.7)	5	0.654	0.930
Arthritis or Rheumatism	4 (2.9-5.5)	3.5 (2.8-4.2)	-14.2	10.9 (9.4-12.6)	15 (13.4-16.8)	37.6	<0.001	<0.001

to be continued

Continuation of Table 2

Variables	Male 2013 % (95% CI)	Male 2019 % (95% CI)	V*	Female 2013 % (95% CI)	Female 2019 % (95% CI)	V*	p* 2013	p* 2019
SOUTH REGION								
Hypertension	21.5 (18.4-24.8)	22 (20.2-23.8)	2.3	32.6 (29.1-36.3)	35 (32.8-37.4)	7.4	0.049	<0.001
Chronic Back Problem	13.2 (10.7-16)	11.1 (9.9-12.4)	-18.9	21.5 (18.8-24.4)	19.7 (17.7-21.8)	-9.1	0.021	<0.001
Hypercholesterolemia	8.7 (6.6-11.3)	9.7 (8.5-11)	11.5	18.2 (15.6-21.1)	17.7 (15.9-19.6)	-2.8	0.001	<0.001
Diabetes Mellitus	7.2 (5.2-9.9)	8.2 (7.1-9.4)	13.9	9.4 (7.5-11.6)	11.3 (9.8-13)	20.2	0.703	0.425
Arthritis or Rheumatism	4.1 (2.8-6)	3.9 (3.2-4.7)	-5.1	14.6 (12.4-17.1)	14.4 (12.8-16.2)	-1.4	<0.001	<0.001
CENTRAL-WEST REGION								
Hypertension	19.1 (16.4-22.2)	22.2 (19.7-25)	16.2	31.6 (28.1-35.4)	34.7(31.9-37.7)	9.8	0.001	<0.001
Chronic Back Problem	9.9 (7.8-12.6)	10.5 (8.9-12.4)	6.1	18.6 (15.9-21.6)	17.9 (15.6-20.5)	-3.9	0.001	0.002
Hypercholesterolemia	8.2 (6.1-10.9)	9.1 (7.4-11.1)	11.0	17.6 (14.9-20.7)	17.1 (14.9-19.6)	-2.9	0.002	0.001
Diabetes Mellitus	7.9 (6-10.5)	8.7 (7-10.8)	10.1	13.2 (10.7-16.2)	14.4 (12.3-16.8)	9.1	0.150	0.024
Arthritis or Rheumatism	4.7 (3.3-6.6)	4 (3-5.4)	-17.5	13.3 (11.3-15.5)	14.1 (12.1-16.2)	6	<0.001	<0.001

Estimated percentages using sampling weights. V: percentage variation in prevalences between 2013 and 2019 [(value at later time ÷ value at earlier time)–1] × 100. *Chi-square test for the association between sexes.
Source: National Health Survey, 2013 and 2019.

Table 3. Distribution of prevalences and 95% Confidence Intervals (95% CI) of morbidities among older Brazilian adults according to age groups and percentage variation between the years 2013 (n = 11,177) and 2019 (n = 22,728) in the major Brazilian regions. National Health Survey, Brazil, 2013 and 2019.

Variables	60–79 years 2013 % (95% CI)	60–79 years 2019 % (95% CI)	V	80 years or over 2013 % (95% CI)	80 years or over 2019 % (95% CI)	V	p* 2013	p* 2019
BRAZIL								
Hypertension	43.8 (42.1-45.5)	48.1 (47-49.2)	9.8	7.4(6.6-8.3)	8.3 (7.7-8.9)	12.2	0.135	<0.001
Chronic Back Problem	24.4 (23-25.8)	27.1 (26.1-28.2)	11.1	3.8 (3.2-4.5)	3.9 (3.5-4.4)	2.6	0.840	0.139
Hypercholesterolemia	23.3 (21.9-24.7)	25.1 (24.1-26.1)	7.7	2.6 (2.1-3.1)	2.9 (2.5-3.3)	11.5	<0.001	<0.001
Diabetes Mellitus	16.6 (15.4-17.9)	18.1 (17.3-19)	9.0	2.5 (2.1-3.1)	2.7 (2.4-3.1)	8.0	0.702	0.630
Arthritis or Rheumatism	13.7 (12.7-14.8)	15.6 (14.7-16.5)	13.9	2.8 (2.3-3.3)	2.6 (2.3-3)	-7.7	0.007	0.329
NORTH REGION								
Hypertension	17.2 (13.4-21.9)	15.6 (13.9-17.6)	-10.3	2 (1.2-3.4)	3.1 (2.4-4.1)	55.0	0.712	0.023
Chronic Back Problem	18.4 (14.5-23.1)	25.8 (23.3-28.4)	40.2	1.6 (0.9-2.6)	3 (2.3-3.9)	87.5	0.445	0.067
Hypercholesterolemia	21.9 (17.9-26.5)	21.5 (19.4-23.7)	-1.9	0.7 (0.3-1.5)	2.7 (1.9-3.7)	285.7	0.001	0.236
Diabetes Mellitus	14.4 (10.8-19)	16.1 (14.1-18.2)	11.8	1.4 (0.8-2.4)	1.7 (1.2-2.4)	21.4	0.790	0.046
Arthritis or Rheumatism	17.2 (13.4-21.9)	15.6 (13.9-17.6)	-10.3	2 (1.2-3.4)	3.1 (2.4-4.1)	55.0	0.712	0.023
NORTHEAST REGION								
Hypertension	40 (37.3-42.7)	48 (46.2-49.8)	20.0	6.6 (5.4-8)	9.3 (8.2-10.5)	40.9	0.552	0.476
Chronic Back Problem	24.4 (21.9-27.1)	27.1 (25.3-28.9)	11.1	1.3 (3.2-5.6)	4 (3.2-4.9)	207.7	0.978	0.007
Hypercholesterolemia	22.5 (20.4-24.8)	24.2 (22.6-25.8)	7.6	2.6 (1.8-3.7)	3.5 (2.9-4.3)	34.6	0.018	0.009
Diabetes Mellitus	15.7 (13.8-17.8)	17.4 (16.2-18.7)	10.8	2.9 (2.1-4.1)	3.2 (2.5-4.1)	10.3	0.819	0.878
Arthritis or Rheumatism	14.3 (12.4-16.4)	14.5 (13.3-15.8)	1.4	3.2 (2.3-4.4)	2.8 (2.3-3.5)	-14.3	0.142	0.690
CENTRAL-WEST REGION								
Hypertension	45 (42.2-48)	48.6(46.6-50.5)	8.0	8.5 (7.2-10.1)	8.2 (7.2-9.3)	-3.7	0.113	0.068
Chronic Back Problem	22.5 (20.3-24.9)	27.5 (25.7-29.4)	22.2	4 (3-5.2)	4.3 (3.6-5.1)	7.5	0.690	0.945
Hypercholesterolemia	23.4 (21.1-25.8)	26.4 (24.5-28.3)	12.8	2.9 (2.2-3.8)	2.7 (2.2-3.3)	-7.4	0.023	<0.001
Diabetes Mellitus	17.4 (15.5-19.5)	18.7 (17.2-20.3)	7.5	2.9 (2.1-3.8)	2.7 (2.2-3.4)	-7.4	0.847	0.685
Arthritis or Rheumatism	12.1 (10.5-13.9)	15.9 (14.3-17.6)	31.4	2.8 (2-3.8)	2.6 (2-3.3)	-7.7	0.045	0.654

to be continued

Continuation of Table 3

Variables	60–79 years 2013 % (95% CI)	60–79 years 2019 % (95% CI)	V	80 years or over 2013 % (95% CI)	80 years or over 2019 % (95% CI)	V	p* 2013	p* 2019
SOUTHEAST REGION								
Hypertension	47.5 (43.9-51.2)	48.9 (46.4-51.3)	2.9	6.6 (4.9-8.8)	8.1 (7-9.5)	22.7	0.650	<0.001
Chronic Back Problem	31 (27.6-34.6)	27.1 (25-29.2)	14.4	3.6 (2.5-5.2)	3.7 (2.9-4.8)	2.8	0.565	0.778
Hypercholesterolemia	24.5 (21.5-27.8)	24.8 (22.9-26.8)	1.2	2.4 (1.4-3.9)	2.5 (1.9-3.3)	4.2	0.212	0.032
Diabetes Mellitus	15.3 (12.5-18.4)	17 (15.2-18.8)	11.1	1.3(0.7-2.3)	2.5 (1.9-3.4)	92.3	0.357	0.463
Arthritis or Rheumatism	16.2 (13.8-19)	16.1 (14.5-17.9)	0.6	2.4 (1.6-3.5)	2.2 (1.6-3)	9.1	0.515	0.965
SOUTH REGION								
Hypertension	44.8 (40.9-48.7)	49.8 (46.9-52.8)	11.2	6 (4.5-7.9)	7.1 (5.6-9)	18.3	0.731	0.066
Chronic Back Problem	26.3 (23-29.8)	25.6 (23.1-28.4)	2.7	2.2 (1.5-3.3)	2.8 (2-3.9)	27.3	0.068	0.431
Hypercholesterolemia	23.6 (20.4-27.2)	23.3 (20.8-26)	1.3	2.1 (1.4-3.3)	2.9 (2-4)	38.1	0.126	0.858
Diabetes Mellitus	18.9 (15.8-22.5)	20.7 (18.2-23.5)	9.5	2.2 (1.4-3.4)	2.4 (1.4-4)	9.1	0.897	0.750
Arthritis or Rheumatism	15.2 (12.7-18.1)	15.7 (13.6-17.9)	3.3	2.7 (1.9-3.9)	2.4 (1.7-3.4)	12.5	0.048	0.278

Estimated percentages using sampling weights. V: percentage variation in prevalences between 2013 and 2019 [(value at later time ÷ value at earlier time)–1] × 100. *Chi-square test for the association between age groups. **Source:** National Health Survey, 2013 and 2019.

DISCUSSION

The present study provides a comprehensive and representative analysis of the most prevalent morbidities among older Brazilian adults across regions. The analysis of proportional distributions according to sex and age groups at two distinct time points offers a broad understanding of the complexities of aging and contributes to advancing knowledge in geriatrics and gerontology.

Accelerated population aging in Brazil and its regions is evident, with the Southeast, Northeast, and South presenting the highest proportions of older adults in both years analyzed. The highest proportion of younger older adults was identified in the North region in 2013 and in the Central-West region in 2019, whereas the highest proportion of the oldest old was observed in the Northeast region in both years. This study reaffirms the country's regional disparities, especially in health, underscoring the need for regionally tailored actions[7].

Although chronic diseases have increased in the population, the perception of "very good/good" health also increased across all regions (especially in the North and South), whereas the perception of "poor/very poor" health decreased (except in the Southeast). However, studies show that the presence of chronic diseases is associated with worse self-rated health among older adults, particularly women, suggesting that this indicator remains highly subjective[15,16].

Corroborating the results of this study, a cross-sectional study conducted in Minas Gerais with 1,691 older adults aged 60 years and over, considering 25 noncommunicable chronic diseases, found the most prevalent morbidities to be hypertension (61.9%), followed by chronic back problem (48.6%)[17]. In the present study, these two morbidities were proportionally more prevalent in most Brazilian regions in both years, except in the North and Southeast regions in 2013, where hypertension and hypercholesterolemia were more prevalent.

Hypertension was also identified as the morbidity with the highest percentage of self-report among older adults in national[17,18] and international[19,20] studies. A time-series study using data from the Brazilian Surveillance System of Risk and Protective Factors for Chronic Diseases showed that self-reported hypertension increased significantly among older adults according to sex and age groups[21].

Cardiovascular diseases are the leading causes of death in Brazil and worldwide, with hypertension, diabetes mellitus, and hypercholesterolemia being the main risk factors[21]. Significant differences were observed in the prevalence of diabetes mellitus across regions and between sexes, with higher prevalence among men in the Southeast region and among women in the Central-West region in both years. Hypercholesterolemia showed the greatest percentage increase between the years in the oldest old in the North region, although this is the region with the lowest overall proportion of older adults[22].

These regional differences may be influenced by sociocultural specificities, which should be considered in the planning of public policies and health actions[8,11]. These morbidities require continuous control to prevent cardiovascular complications, which is directly related to patient adherence to treatment. In this regard, healthcare professionals must understand the factors that hinder adequate treatment, particularly among the oldest old, and develop health education strategies for correct medication use, educational groups that promote healthy lifestyles, and longitudinal and multidimensional follow-up of morbidities[23].

Chronic back problem showed the largest increase from 2013 to 2019 in the North region among both sexes and in the younger older adult age group. According to the IBGE, in 2019, spine-related diseases were the most common among residents of Rondônia and may be related to work activities characteristic of the North region, such as extractivism and agriculture/livestock[24]. This morbidity is highly prevalent and is associated with demographic, socioeconomic, and lifestyle factors[17]. It results in negative impacts on health conditions and requires intensified prevention, especially among younger age groups, as the severity of this problem increases with advancing age[17].

Arthritis or rheumatism showed a substantial reduction between the years among men, both nationwide and across all regions, whereas an increase

was observed among women, except in the South region. Although no other studies with this specific focus were identified, it is important to consider that the occurrence of this condition in older adults may be influenced by several factors, such as genetics, obesity, diet, and activities/occupation, which differ across sexes, age groups, and regions and may lead to decreased functional capacity[25].

The Southeast region presented the highest prevalence of morbidities. It stands out as the most populous and urbanized region, with the greatest population density in the country, in addition to being considered the region with the highest Gross Domestic Product (GDP)[26]. Aging in large urban centers is heterogeneous and shaped by factors such as average income and urban development processes, which demand distinct public policies. Furthermore, there is a feminization of aging in urban settings, marked by greater female migration from rural to urban areas, combined with women's greater longevity[27].

Brazilian regions present significant sociocultural disparities that may influence the different prevalence of morbidities among sex and age subgroups. The literature indicates that territorial, social, economic, and cultural inequalities significantly affect the socioeconomic and demographic conditions of the older population, reinforcing its heterogeneous distribution in Brazil[11]. Moreover, longevity is associated with social inequalities, resulting in distinct patterns of population growth and aging across Brazilian regions[28].

The morbidities investigated were more prevalent among older women, who also represent the majority of the population assessed. In general, women show greater concern with health conditions than men, resulting in more frequent use of healthcare services, which may partially explain the higher percentage of diagnoses of noncommunicable chronic diseases. However, according to studies using public data, women experience higher life expectancy with functional disability compared with men, across all ages and regions of Brazil[29].

Additionally, the distribution of morbidities was proportionally higher among younger older adults, as this group is considerably larger. This result may also be partially explained by the fact that most diagnoses of noncommunicable chronic diseases occur in the younger older adult age group. This may be due to the earlier onset of several chronic conditions and improved access to healthcare in this group, whereas monitoring and treatment levels tend to be lower among the oldest old[30]. Other studies assessing the presence of morbidities across older adult age groups have also found higher prevalence in the oldest age group[11].

It is important to consider the remarkable heterogeneity of biological age among individuals within the same age category. Furthermore, social disparities, which are already evident among older adults in Brazil, become even more pronounced among individuals aged 80 years and over[12]. These findings reinforce the importance of health promotion strategies adapted by sex and age group, while addressing social inequalities.

One limitation of this study relates to potential recall bias due to the use of self-reported information, as well as disparities in educational levels across regions, which may have influenced morbidity estimates. Another limitation concerns the absence of objective clinical measures to confirm diagnoses and other variables. Additionally, it was not possible to directly control the quality and standardization of data collection procedures or variable categorization, as previously collected secondary data were used. The exclusion of socioeconomic status from the main analyses may also have restricted the understanding of socioeconomic inequalities associated with morbidities.

Nevertheless, this study provides relevant data on the morbidity profile of older Brazilian adults, stratified by sex, age groups, and regions, based on a nationally representative sample. The findings contribute to the planning of actions aimed at preventing and managing chronic diseases, particularly within the context of Primary Health Care. The comparative analysis between 2013 and 2019 enables the identification of trends and the prioritization of strategies adapted to the epidemiological and regional context of the country, promoting greater equity.

CONCLUSION

The most prevalent morbidities were, respectively, hypertension, chronic back problem, hypercholesterolemia, diabetes mellitus, and arthritis or rheumatism, both in Brazil and across its regions. The distribution of morbidities was more prevalent among younger older adults, women, and residents of the Southeast region, despite notable differences across subgroups. Overall, we observed an upward trend in the percentage variation of morbidities among older adults between 2013 and 2019 across the Brazilian regions.

This study makes an important contribution to public health research, particularly in geriatrics and gerontology, by providing data on the distribution of morbidities among older Brazilian adults according to sex- and age-specific subgroups, as well as regional disparities. Identifying regional patterns and inequalities highlights the need for more tailored and integrated public health strategies to address the health challenges faced by this population.

For future studies, the monitoring and follow-up of these morbidities within regional contexts is recommended, considering their specific characteristics, to obtain a longitudinal understanding of the health profile of older adults in Brazil, given the importance of identifying health needs to promote quality of life and equitable healthy aging.

AUTHORSHIP

- Emily da Silva Eberhardt — conception, design, data analysis and interpretation; drafting and critical revision; final approval of the version; responsibility for all aspects of the work; project administration; formal analysis; conceptualization; data curation; writing – original draft; writing – review and editing; investigation; methodology; resources; approval of the version to be published.

- Sara Calumbi Nachipindo Kawalende — data analysis and interpretation; drafting and critical revision; final approval of the version; responsibility for all aspects of the work; formal analysis; conceptualization; writing – original draft; writing – review and editing; approval of the version to be published.

- Idiane Rosset — conception, design, data analysis and interpretation; drafting and critical revision; final approval of the version; responsibility for all aspects of the work; project administration; formal analysis; conceptualization; writing – original draft; writing – review and editing; investigation; methodology; resources; supervision; approval of the version to be published.

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