

Chronic diseases in the non-village indigenous population: data from the National Health Survey, 2019

Doenças crônicas na população indígena não aldeada: dados da Pesquisa Nacional de Saúde, 2019

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DOI: 10.1590/2358-2898202414288891

ABSTRACT The aim of this study was to characterise the sociodemographic profile of the adult and elderly non-indigenous population of Brazil, as well as to estimate the prevalence of multimorbidity and specific chronic diseases/conditions, and for the most frequent ones, according to gender and age groups. Cross-sectional study with data from indigenous people (aged ≥ 20 years) who took part in the National Health Survey in 2019. The average age was 45.2 years (95% CI: 43.1-47.3), 23.2% were elderly (age ≥ 60 years), and 87.5% lived in urban areas. Around 60% had at least one chronic disease/condition, and the most prevalent were: hypertension (29.3%; 95% CI: 23.7-35.5), chronic spinal diseases/problems (20.6%; 95% CI: 17.3-24.5), hypercholesterolaemia (14.3%; 95% CI: 11.7-17.4), depression (10%; 95% CI: 7.4-13.5) and arthritis/rheumatism (10%; 95% CI: 6.6-14.9). In the elderly, the prevalence of hypertension was around 3.6 times higher than in adults (65% versus 18.1%; $p < 0.001$), and 28.6% reported chronic spinal diseases/problems compared to 18.2% of adults ($p = 0.019$). The study presents unpublished data on the prevalence of chronic diseases/conditions in the non-indigenous population in Brazil, indicating a high prevalence of hypertension, spinal diseases/problems, hypercholesterolaemia, depression and arthritis/rheumatism.

KEYWORDS Indigenous peoples. Health of indigenous peoples. Chronic disease. Health surveys.

RESUMO Objetivou-se caracterizar o perfil sociodemográfico da população indígena adulta e idosa não aldeada do Brasil, bem como estimar a prevalência de multimorbidade e doenças/condições crônicas específicas, e para as mais frequentes, de acordo com o sexo e as faixas etárias. Estudo transversal com dados de indígenas (idade ≥ 20 anos) que participaram da Pesquisa Nacional de Saúde em 2019. A média de idade foi de 45,2 anos (IC 95%: 43,1-47,3), 23,2% eram idosos (idade ≥ 60 anos), e 87,5% residiam em área urbana. Cerca de 60% apresentavam ao menos uma doença/condição crônica, e as mais prevalentes foram: hipertensão arterial (29,3%; IC 95%: 23,7-35,5), doenças/problemas crônicos da coluna vertebral (20,6%; IC 95%: 17,3-24,5), hipercolesterolemia (14,3%; IC 95%: 11,7-17,4), depressão (10%; IC 95%: 7,4-13,5) e artrite/reumatismo (10%; IC 95%: 6,6-14,9). Nos idosos, a prevalência de hipertensão arterial foi cerca de 3,6 vezes maior do que nos adultos (65% versus 18,1%; $p < 0,001$), e 28,6% referiram doenças/problemas crônicos da coluna vertebral em relação a 18,2% dos adultos ($p = 0,019$). O estudo apresenta dados inéditos sobre a prevalência de doenças/condições crônicas na população indígena não aldeada no Brasil, indicando elevadas prevalências de hipertensão arterial, doenças/problemas da coluna, hipercolesterolemia, depressão e artrite/reumatismo.

PALAVRAS-CHAVE Povos indígenas. Saúde de populações indígenas. Doença crônica. Inquérito de saúde.

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Introduction

The demographic censuses carried out in Brazil show that the population growth of indigenous people is greater than that observed for the Brazilian population as a whole¹⁻⁴. The number of people who declared themselves indigenous using the colour or race questionnaire rose from 294,131 in 1991 to 734,127 in 2000, and to 817,963 in 2010⁴. Indigenous belonging (people or ethnicity and languages spoken) was investigated for the first time in the 2010 Census, which identified more than three hundred indigenous peoples living mainly in the North and Northeast regions, and noted an increase of 78,954 people who considered themselves indigenous^{1,3}. The number of people who declared themselves indigenous in Brazil in 2022 was 1,693,535, which represented 0.83% of the country's total population, almost double that of the previous census⁵.

Since the 1988 Federal Constitution, various public policies have been created and implemented for indigenous peoples, such as the Indigenous Health Care Subsystem within the Unified Health System (SasiSUS – *Sistema de Atenção à Saúde Indígena no âmbito do Sistema Único de Saúde*), whose care model is organised through the Special Indigenous Health Districts (DSEI – *Distritos Sanitários Especiais Indígenas*), which must offer Primary Health Care (PHC) services to indigenous villagers on the lands and territories where they live^{6,7}. The National Policy for the Health Care of Indigenous Peoples (PNASPI – *Política Nacional de Atenção à Saúde dos Povos Indígenas*), created in 2002, was an important milestone, its main objective being to guarantee access to comprehensive health care, based on the principles and guidelines of the SUS and taking into account issues related to ethnic, cultural, geographical, epidemiological, historical and political diversity⁶⁻⁸.

Although the implementation of the PNASPI has achieved progress in relation to indigenous health in Brazil, with a view to guaranteeing comprehensive and equitable

care, the challenges faced in terms of access and comprehensive health care are still many^{2,9,10}. The urbanisation of the population can – to some extent – increase access to health services (such as consultations, examinations, hospitalisations, etc.), with an impact on the increase in the diagnosis of diseases (new and old cases) and treatment. However, difficulties in accessing quality health services and follow-up after diagnosis are still challenges for indigenous health care^{7,8,11}.

It is worth pointing out that before SasiSUS was created in 1999, information on indigenous health was not systematically collected, making it impossible to draw up a national picture of the health conditions of this population⁸. Based on SasiSUS information on notified cases, the occurrence of Chronic Non-Communicable Diseases (NCDs) increased from 138.5 to 203.4 per 10,000 inhabitants between 2015 and 2017; the most frequent diseases among indigenous people were cardiovascular diseases, chronic respiratory diseases, diabetes mellitus and neoplasms, which mainly affect women⁷. As for the causes of death in Brazil's indigenous population, a study that analysed mortality using data from the Mortality Information System (SIM – *Sistema de Informação de Mortalidade*) from 2000, 2010 and 2018 found a triple burden of disease, with a predominance of NCDs, especially those of the circulatory system, respiratory system, diabetes and neoplasms¹², a continuation of infectious and parasitic diseases, and an increase in external causes, changes that characterise the phenomena of demographic, epidemiological and nutritional transition^{7,9,12}.

In the national literature, there are no estimates of the prevalence of specific NCDs in the non-indigenous population. It should be borne in mind that a large part of this population in Brazil lives in urban areas and on the outskirts, places lacking in infrastructure and public facilities¹³. Also, contact with other cultures (resulting from this urbanisation) increases the risk of new health problems arising, related to changes in lifestyle, eating habits and other

health-related behaviours, which can increase the occurrence of NCDs^{2,7,13-15}. In this sense, the aim of this communication was to characterise the sociodemographic profile of the adult and elderly non-indigenous population of Brazil, as well as to estimate the prevalence of multimorbidity and specific chronic diseases/conditions, and for the most frequent ones, according to gender and age groups.

Material and methods

This study was carried out using public domain data on indigenous adults and elderly people (aged ≥ 20 years) who took part in the National Health Survey (PNS), a national household-based survey carried out in Brazil in 2019 (PNS 2019). The PNS 2019 database is available for public access and use on the PNS website via: 'About the survey'; 'Databases (PNS 2019, IBGE Microdata)'; 'PNS 2019 Microdata Archives'¹⁶.

The population surveyed in the PNS 2019 corresponded to residents of permanent private households in Brazil, excluding census tracts located in areas with special characteristics and low population, such as: barracks, military bases, lodgings, camps, boats, indigenous villages, penitentiaries, penal colonies, prisons, jails, asylums, orphanages, convents and hospitals. A detailed description of the conceptual and methodological aspects of the research has been published^{17,18}.

This study used data from individuals who declared themselves indigenous (information based on the question about colour or race) who answered the PNS 2019 questionnaire, referring to the selected resident ($n = 651$). Information on the following chronic diseases/conditions was taken into account: hypertension; diabetes; high cholesterol (hypercholesterolemia); heart disease such as heart attack, angina, heart failure or other; Cerebral Vascular Accident (CVA) or stroke; asthma or asthmatic bronchitis; arthritis/rheumatism; chronic spinal disease/problem such as chronic back or neck pain, lumbago, sciatica,

vertebrae or disc problems; Work-Related Musculoskeletal Disorder (WMSD); depression; other mental illness such as anxiety disorder, panic disorder, schizophrenia, bipolar disorder, psychosis or Obsessive-Compulsive Disorder (OCD); chronic lung disease such as pulmonary emphysema, chronic bronchitis or Chronic Obstructive Pulmonary Disease (COPD); cancer; chronic kidney failure; and other chronic illness. All questions referred to previous medical diagnosis, except for chronic spinal diseases/problems. In the investigation into depression, the diagnosis could have been given by the doctor or another mental health professional (psychologist/psychiatrist).

To compose the variable number of chronic diseases and estimate their prevalence, all the aforementioned chronic diseases/conditions were taken into account. When analysing specific diseases, stroke, asthma, WMSD, lung disease, cancer and kidney failure did not have enough cases to calculate specific estimates with acceptable precision.

Point and interval prevalences were estimated for the number of chronic diseases (none, one, two, three or more) and specific diseases, considering a 95% confidence interval (95% CI). Prevalence and Prevalence Ratios (PR) and the respective 95% CI of the most frequent diseases/conditions according to sex and age group were also estimated. Differences were verified using the chi-square test (Rao-Scott) with a significance level of 5%. PRs were obtained using Poisson regression. The analyses were carried out using Stata 15.1 statistical software, in the survey module, which considers the survey's complex sampling design.

PNS 2019 was approved by the National Research Ethics Committee (Certificate of Submission for Ethical Appraisal – CAAE n° 11713319.7.0000.0008 and opinion no. 3.529.376, dated 23 August 2019). All interviewees were previously consulted, informed and agreed to take part in the research^{17,18}. The data was collected and analysed in accordance with the guidelines and standards of Resolutions

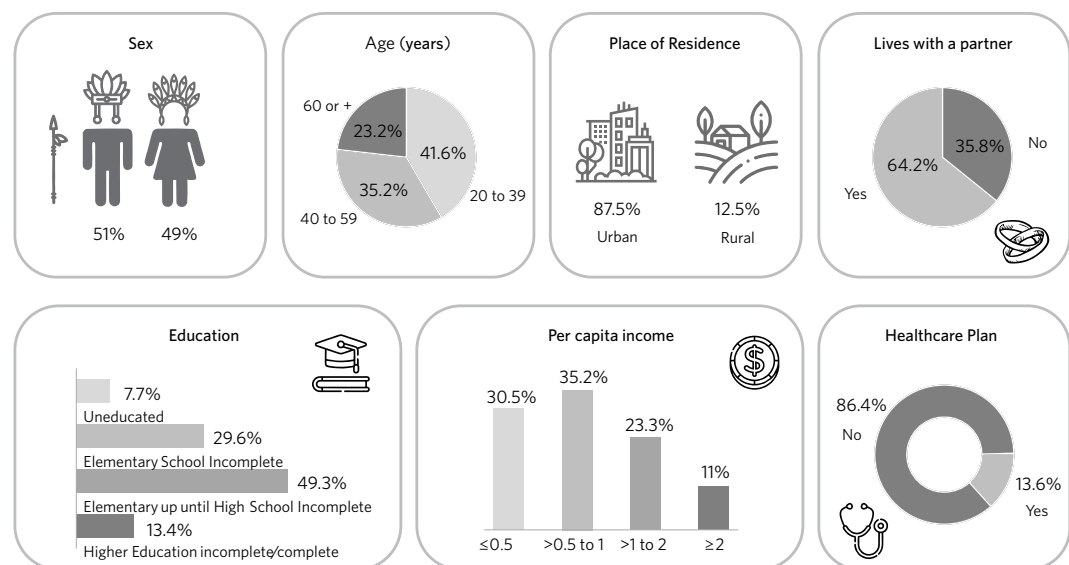
466/2012¹⁹ and 510/2016²⁰ of the National Health Council, which regulate the ethical and legal aspects of scientific research in Brazil.

Results

The average age of the non-indigenous population was 45.2 years (95% CI: 43.1-47.3), and

the gender distribution was similar ($p > 0.05$); 23.2% were aged 60 or over, 87.5% lived in an urban area, 64.2% lived with a partner, 37.3% had no education/ incomplete primary education, 30.5% and 35.2% had low incomes (less than or equal to 0.5 minimum wage and from half to 1 minimum wage respectively) and 86.4% did not have private health insurance (figure 1).

Figure 1. Sociodemographic characterisation of the indigenous population (age ≥ 20 years). National Health Survey, 2019



Source: own elaboration based on PNS 2019¹⁶.

In the adult population, around 60 per cent had at least one chronic disease, and 35.3 per cent had multimorbidity. Hypertension (29.3%; 95% CI: 23.7-35.5), chronic spinal diseases/problems (20.6%; 95% CI: 17.3-24.5), hypercholesterolaemia (14.3%; 95% CI: 11.7-17.4),

depression (10%; 95% CI: 7.4-13.5) and arthritis/rheumatism (10%; 95% CI: 6.6-14.9) were the diseases/conditions with the highest prevalence, in order of importance, among those investigated (table 1).

Table 1. Prevalence of Chronic Non-Communicable Diseases (NCDs) in the indigenous population (age \geq 20 years). National Health Survey, 2019

Diseases/Chronic conditions	Prevalence (%)	CI 95%
Number of chronic diseases		
None	40.7	33.4-48.4
One	24.0	20.2-28.2
Two	12.8	8.6-18.6
Three or more	22.5	18.5-27.1
Hypercholesterolemia	29.3	23.7-35.5
Diabetes mellitus	9.1	7.1-11.6
High Cholesterol	14.3	11.7-17.4
Stroke*	5.8	3.6-9.2
Asthma*	-	-
Arthritis/rheumatism	-	-
Spine problem	10.0	6.6-14.9
WMSD*	20.6	17.3-24.5
Depression	-	-
Other mental diseases	10.0	7.4-13.5
Pulmonary Diseases*	6.5	4.6-9.1
Cancer*	-	-
Chronic Renal Disease	-	-
Other chronic disease	-	-
Outra doença crônica	8.4	5.3-13.0

Source: Own elaboration based on the PNS 2019¹⁶.

CI 95%: Confidence Interval of 95%. *Insufficient number of cases to calculate estimates with acceptable precision.

WMSD: Work-Related Musculoskeletal Disorder.

For the most frequent chronic diseases/conditions, it was also found that the prevalence of hypertension was higher in women (37.5% versus 21.2%; $p = 0.001$) and that there were no significant differences for chronic spinal diseases/problems ($p = 0.809$). Regarding age group, in the elderly (age \geq 60 years),

the prevalence of hypertension was around 3.6 times higher compared to the adult population (65% versus 18.1%; $p < 0.001$), and 28.6% of the elderly reported spinal diseases/problems compared to 18.2% of adults ($p = 0.019$) (table 2).

Table 2. Prevalence and gross prevalence rate of hypertension, spine problem and high cholesterol in the indigenous population (age ≥ 20 years) according to sex and age groups. National Health Survey, 2019

Diseases/Chronic Conditions	%	CI 95%	p value	PR gross (CI 95%)
Arterial Hypertension				
Sex			0.0015	
Man	21.2	15.4-28.5		0.56 (0.39-0.81)
Woman	37.5	29.6-46.3		1
Age Groups			<0.0001	
20 to 59 years	18.1	13.4-23.9		1
60 years and more	65.0	55.6-73.3		3.59 (2.62-4.90)
Hypercholesterolemia				
Sex			0.3053	
Man	12.6	9.5-16.5		0.78 (0.49-1.25)
Woman	16.0	11.5-21.9		1
Age Groups			<0.0001	
20 to 59 years	10.4	7.6-14.2		1
60 years and more	26.3	19.8-34.0		2.51 (1.63-3.88)
Spine Problem				
Sex			0.8088	
Man	20.2	16.0-25.2		0.96 (0.67-1.36)
Woman	21.1	16.0-27.3		1
Age Groups			0.0187	
20 to 59 years	18.2	14.4-22.8		
60 years and more	28.6	21.5-36.9		1.57 (1.08-2.27)

Source: Own elaboration based on the PNS 2019¹⁶.

CI 95%: Confidence Interval of 95%. P value: p value of the chi-square test (Rao-Scott). PR: Prevalence Ratio.

Discussion

The results showed that, in Brazil, around 60% of indigenous people aged 20 and over had at least one chronic illness and that around 35% had two or more illnesses (multimorbidity). The most prevalent diseases were hypertension, chronic spinal diseases/problems and hypercholesterolaemia. Hypertension was more common among women. In the elderly, the prevalence of hypertension was around 3,6 times higher than in adults; hypercholesterolaemia, 2,5 times, and spinal diseases/problems were also more frequent in those aged 60 or over.

This study found that 67.2% of the indigenous population had completed at least primary school, a much higher percentage than that observed in previous demographic censuses¹. A study that looked at the sociodemographic characteristics of indigenous people in the 2000 and 2010 censuses found that the proportion of people with complete primary education or more increased significantly throughout the country (16.4% to 21.2%) and in urban areas (28.2% to 37.9%) and rural areas (3.5% to 10.5%)¹⁴. It should be noted that in recent years there has been an expansion of public policies aimed at education for indigenous people²¹, which may have

contributed to this increase, but they still have a lower level of education than the general population in Brazil¹.

Regarding per capita household income, most of the indigenous population (65.7%) reported having an income of up to 1 minimum wage. In the last demographic census (2010), it was found that most indigenous people (aged ≥ 10 years) had no income or received up to 1 minimum wage¹. Bastos et al.¹⁴ identified an 8.4% increase in the frequency of indigenous people earning less than 1 minimum wage (from 48.3% to 56.7%) and a 9.6% decrease in the frequency of individuals earning more than 2 minimum wages between 2000 and 2010.

It was also observed that 86.4% (95% CI: 82.1-89.8) of the adult and elderly non-indigenous population depended exclusively on the public system, the SUS, a higher percentage than that found for the non-indigenous adult population (72.8%; 95% CI: 71.7-73.3) (data not shown). This means that, for those who had access, almost all diagnoses of the diseases investigated were carried out in public health services. It should be borne in mind that health structures in indigenous territories are precarious, and the high turnover of professionals, as well as the logistical complexity found in some regions of the country, negatively affects the quality of the health services provided^{2,10,11}, which leads us to assume that there is a significant underdiagnosis of chronic diseases/conditions among indigenous villagers.

A study carried out by Araujo Junior⁸ revealed the precarious physical structure of the Indigenous Health Houses, which are responsible for housing and feeding patients and their companions, the need to provide health care and ensure better liaison with referral hospitals and medium and high-complexity care to reduce the long waiting period for treatment. Over the years, there has been a prioritisation of emergency and palliative care for this population and a weakening of PHC: the high turnover of health professionals and the lack of bonds make it difficult to understand the cultural specificities that permeate

the indigenous health care process^{2,22}, as well as the lack of professional training in approach, care and treatment – respecting the culture and diversity of knowledge of this population^{2,8}.

When critically evaluating the implementation of the PNASPI, Mendes et al.² highlights, among the challenges, the inequalities in health indicators that persist almost 20 years after the creation of the SasiSUS, the increase in the prevalence of NCDs, the low resolution of PHC actions, restricted access to data from the Indigenous Health Care Information System (SIASI) and problems related to the reliability of the information collected, as well as the capacity for articulation between traditional indigenous medicine and the SUS^{6,8,11}.

In addition to structural violence, such as inadequate health care and the endemic and deficiency diseases to which indigenous peoples are exposed, chronic diseases in this population may be a reflection of the impacts of subsistence strategies and environmental and territorial changes that have been occurring in this population over the years^{7,9,15,22}. In the city of Manaus, a study that sought to compare risk factors for cardiovascular diseases between indigenous and non-indigenous people (neighbours who shared the same socio-environmental conditions as the indigenous people) found that individuals from the upper Rio Negro had an anthropometric, metabolic and blood pressure profile that was more similar to that of non-indigenous groups²³. It should be noted that no previous epidemiological studies were found that analysed the prevalence of Chronic NCDs in the non-indigenous population in Brazil, which made it difficult to compare with the findings of this study.

When considering the indigenous population of Brazil as a whole, data from SIASI showed that between 2015 and 2017, 42,583 reported cases of Chronic NCDs were recorded, with a higher frequency in females (as in the general population, women tend to access health services more), with cardiovascular

diseases and diabetes being more prevalent in the population aged ≥ 40 years, and respiratory diseases in the elderly population⁷. It should be borne in mind that some risk factors for Chronic NCDs, such as the abusive consumption of distilled alcoholic beverages, are more prevalent in the non-indigenous population, a factor made worse by their proximity to the non-indigenous population^{24,25}.

In Brazil, there are few studies with information on other risk factors, such as smoking, physical inactivity and eating habits in the non-indigenous population²⁶. Studies carried out with indigenous villagers indicate unhealthy eating habits, a high percentage of overweight, sedentary lifestyles and high blood pressure in this subgroup²⁷⁻²⁹. In the Krenak population, on indigenous land located in the municipality of Resplendor, Minas Gerais, the prevalence of hypertension was 31.2% (34.4% for men and 27.6% for women), around 75% of the individuals were overweight, 57% were abdominally obese and 17.5% had hyperglycaemia²⁷. Data from the National Indigenous Health and Nutrition Survey (2008-2009) found that 46% of women in indigenous villages in Brazil were overweight or obese³⁰.

One of the limitations of the survey is that the PNS sample excluded households located in special census sectors, such as indigenous groups (village population), which means that the results cannot be extrapolated to all indigenous Brazilians. Furthermore, the PNS was not designed to represent specific populations, and the sample size was small for the indigenous population. Thus, for less frequent diseases/health conditions, estimates were not presented because the number of observations in some categories did not allow calculation with acceptable precision. Likewise, the assessment of the differences between prevalence rates by sex and age group was restricted to the conditions that occurred most frequently.

It should be emphasised that the estimates of the prevalence of Chronic NCDs are unprecedented and show the magnitude of these conditions for the adult and elderly indigenous

population of Brazil, contributing to the adoption of actions that can meet specific demands for care and treatment – which consider the culture, knowledge and other singularities of these Brazilians. Equity is one of the fundamental guiding principles of the SUS³¹, which seeks to recognise the differences in social determinants – living and health conditions – and the specific needs of distinct population groups, such as the indigenous population⁶.

The results of this study reveal that almost 60% of the adult and elderly Brazilian indigenous population not living in villages had at least one chronic disease, mainly hypertension, chronic spinal diseases/problems, hypercholesterolaemia, arthritis/rheumatism and depression. The challenge facing PHC is the *modus operandi* for implementing practices related to health promotion and disease prevention, considering that the right to health is based on social differences and must take diversity into account.

Collaborators

Francisco PMSB (0000-0001-7361-9961)* contributed to the conception, analysis and interpretation of data, drafting of preliminary versions, critical revision of the intellectual content and final approval of the manuscript. Assumpção D (0000-0003-1813-996X)* contributed to analysing and interpreting data, drafting preliminary versions, critically reviewing the intellectual content and final approval of the manuscript. Bacurau AGM (0000-0002-6671-2284)* contributed to data interpretation, preparation of preliminary versions, critical revision of the intellectual content and final approval of the manuscript. Leitão VBG (0000-0002-7424-7300)* contributed to the critical revision of the intellectual content and final approval of the manuscript. Malta DC (0000-0002-8214-5734)* contributed to data interpretation, critical revision of the intellectual content and final approval of the manuscript. ■

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Received on 09/11/2023

Approved on 06/10/2024

Conflict of interests: non-existent

Financial support: non-existent

Editor in charge: Jamilli Silva Santos