

PREVALENCE OF SELF-REPORTED CHRONIC DISEASES AND HEALTH SERVICES UTILIZATION BY ETHNIC MINORITIES IN MANAUS METROPOLITAN REGION

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Objectives: To assess the prevalence of, and associated factors to, self-reported chronic diseases and health care utilization by ethnicity in the Manaus Metropolitan Region.

Methods: We conducted a cross-sectional, population-based survey from May through August 2015. Using probabilistic sampling in three stages, we recruited adults aged ≥ 18 years. Ethnicity was self-identified as White, Black, Yellow, Brown (Brazilian mixed-race), and Indigenous. We calculated adjusted prevalence ratios (PR) and 95% CI of chronic diseases and health service utilization for each ethnic minority and compared the data using Poisson regression with data from White respondents.

Results: In this study, we interviewed 4,001 people. Of these, 15.9% were White, 7.5% Black, 3.4% Yellow, 72.1% Brown, and 1.0% Indigenous. Indigenous respondents had the highest prevalence of self-reported hypertension (29.4%), diabetes (12.3%) and hypercholesterolemia (17.0%) among the ethnic respondent groups. Compared with the White population, Browns had less health insurance coverage (PR=.76; 95% CI: .62-.93) and reported hypertension (PR=.84; 95% CI: .72-0.98) and diabetes (PR=.69; 95% CI: .51-.94) less frequently. Yellows visited the doctor more frequently than Whites (PR=1.13; 95% CI: 1.04-1.22), with no significant difference in prevalence of diseases.

Conclusions: Indigenous respondents had higher prevalence rates of the investigated diseases. Compared with Whites, Brown respondents had lower rates of self-reported arterial hypertension and diabetes, as well as lower rates of private health insurance coverage. *Ethn Dis.* 2018;28(1):49-54; doi:10.18865/ed.28.1.49

INTRODUCTION

Ethnic minorities are groups whose historical, ethnic, linguistic, religious, and cultural characteristics are distinct from those shared by the dominant population.¹ Associations between self-reported diseases and ethnic minorities have been reported worldwide, including in Brazil;² and, evidence indicates that many of the differences identified may be due to inequalities in access to health care.³

Since the demographic transition that occurred in Brazil, non-communicable diseases have become a major cause of morbidity.⁴ Currently, chronic diseases account for more than 70% of all deaths in the Brazilian population, and they have a negative impact on both the life expectancy and quality of life. Heart disease, stroke, cancer, chronic respiratory diseases, and diabetes are among the leading causes of mortality.⁵ The transition has also affected ethnic minor-

ity populations, which, due to genetic and cultural particularities, may suffer more significant health consequences.

The population of the state of Amazonas, in northern Brazil, is 21.2% White, 4.1% Black, .9% Yellow, 68.9% Brown, and 4.7% Indigenous.⁶ Amazonas has the largest self-declared Indigenous population in Brazil. Of the five Brazilian municipalities with the largest Indigenous population, four are located in Amazonas.⁷

The objectives of our study were to assess the prevalence of, and associated factors to, self-reported chronic diseases and health care utilization by ethnicity in the Manaus Metropolitan Region, in Amazonas, Brazil.

METHODS

Study Design

We conducted our population-based cross-sectional study in the Manaus Metropolitan Region from

Keywords: Brazil; Chronic Disease; Ethnic Groups; Surveys; Cross-Sectional Studies; Health Services

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May to August 2015. The primary outcome was the prevalence of self-reported chronic diseases and health care utilization by ethnicity. This article reports on analysis of data that is part of a larger research effort that aimed to assess use of health care services and resources in the area.⁸

Participants

Adults, aged ≥ 18 years, who signed a written, informed consent form were eligible for the study. Participants were selected using a three-stage cluster sampling design with stratification by sex and age. In the first stage, the 2,647 urban census tracts in the Manaus Metropolitan Region were considered;⁶ of these, 400 primary and 20 replacement tracts were randomly selected. The second stage selected 10 households from each chosen tract by systematic sampling of 1 in every 20 households. In the third stage, all residents aged ≥ 18 years of age were identified and one participant was chosen based on sex and age quotas.

Variables, Sources of Data, and Measures

Interviewers trained in qualitative research conducted face-to-face interviews in Portuguese. Study variables included: age; sex; marital status; level of education; socioeconomic class according to 2015 Brazil criterion of economic classification,⁹ which consists of six strata (from the wealthiest to the poorest: A, B1, B2, C1, C2 and D/E); health insurance coverage; and presence/absence of previously diagnosed chronic diseases (hypertension, diabetes mellitus, and hypercholesterolemia). The use of

health services was measured by self-reported visit to physician, visit to dentist and hospital admission over the preceding 12 months, pursuit of private health insurance and report of searching for a health service to meet a health need (connection to the service). All variables were collected using a validated, semi-structured, and pre-coded questionnaire and are detailed in a previous article.⁸

Ethnicity was self-identified by those interviewed according to

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the Instituto Brasileiro de Geografia e Estatística (IBGE), the official Brazilian institute for demographics studies.⁶ IBGE has five categories for self-classification of ethnicity or color in the Brazilian population: White, Black, Yellow (descendants and mixed-race from Asians), Brown (Brazilian mixed-race, miscegenation from Indigenous, African and European).

A pre-test was performed with 150 participants to assess the adequate comprehension of the instrument. To ensure the reliability of the collected data, 20% of the interviews were audited by telephone, and part of the interview was digitally recorded. The data were automatically tabulated.

Sample Size

According to estimates, the Manaus Metropolitan Region had 2,316,173 adults aged ≥ 18 years in 2013.⁶ The sample size was calculated from an estimated 50% prevalence of use of health care services.⁸ A total sample of 3,598 individuals was calculated with 95%CI, 2% precision, and a design effect of 1.5. An attrition rate of 10% was applied for a target sample size of 4,000. Field data collection continued until reaching this target number.

Statistical Analyses

The prevalence of self-reported chronic disease (hypertension, diabetes mellitus, and hypercholesterolemia) by ethnicity and 95% CI were calculated. Differences across groups were measured by chi-square test at a significance level of $P < .05$. Sex- and age-adjusted prevalence ratios (PR) of chronic diseases and health services utilization among Black, Yellow, Brown and Indigenous groups were compared with the rates among Whites. We used Poisson regression with robust variance and considered the complex sampling design using the Stata 14.2 software. The calculation of PR by this method provides more accurate measures, avoiding overestimations inherent to logistic regression models.¹⁰

RESULTS

Of the 5,410 individuals invited, 4,001 (73.9%) agreed to participate and were included. Of these, 15.9% were White, 7.5% Black, 3.4% Yellow, 72.1%, Brown, and 1.0% Indigenous (Table 1).

Most respondents were aged ≤34 years (49.7%), female (52.8%), single (54.3%), belonged to lower-middle socioeconomic class (C; 57.1%) and had up to high school education (47.5%; Table 1). Most respon-

dents had no health insurance coverage (87.0%) and showed a high use of medical services including visits to the doctor (76.6%), to the dentist (35.9%) and hospital admission (6.8%) over the previous 12 months.

Most White and Yellow respondents had high socioeconomic status (classes A/B), whereas most Indigenous respondents were in the lower social classes (D/E). Indigenous respondents had a non-significant higher prevalence of self-reported hypertension, diabetes and hyper-

cholesterolemia. Non-communicable diseases did not statistically differ across the ethnic groups (Table 1).

Eighty-seven percent of participants had no health insurance and this frequency did not significantly differ across ethnic groups. Black and Yellow respondents visited a physician more frequently over the past 12 months (P=.006). When in need of a health service, most Indigenous people (83.1%) sought the same health unit, while Yellow respondents reported this pattern less frequently

Table 1. Participants' characteristics overall and by ethnicity

Variables	Overall n=4,001	White n=636	Black n=300	Yellow n=138	Brown n=2,886	Indigenous n=41	P
Age group, years							.029
18–24	20.9	24.9	20.5	23.9	20.1	4.7	
25–34	28.8	29.7	26.0	23.1	29.2	26.9	
35–44	21.1	20.0	18.7	24.1	21.5	21.9	
45–59	19.3	17.0	24.7	18.8	19.1	32.0	
≥60	9.9	8.4	10.1	10.1	10.2	14.6	
Sex							.006
Male	47.2	48.4	52.7	33.9	47.1	41.6	
Female	52.8	51.6	47.3	66.1	52.9	58.4	
Marital status							<.001
Married	35.2	38.4	38.1	51.5	33.3	48.9	
Separated	3.9	5.7	4.0	2.9	3.6	5.0	
Divorced	2.6	2.9	1.7	2.2	2.7	2.4	
Widowed	4.0	3.3	2.7	5.1	4.2	9.8	
Single	54.3	49.8	53.6	38.4	56.4	34.0	
Education							.002
College	4.0	4.7	1.3	2.2	4.1	9.8	
Up to high school	47.5	54.8	47.0	45.8	46.2	36.5	
Up to elementary	16.2	13.0	17.6	18.8	16.7	14.7	
Elementary or less	32.3	27.5	34.0	33.3	33.0	39.1	
Socioeconomic class							<.001
A/B	15.7	21.7	15.9	22.4	14.2	7.3	
C	57.1	59.0	56.3	57.3	56.8	58.4	
D/E	27.1	19.3	27.7	20.3	29.0	34.3	
Health insurance							.113
Yes	13.0	16.3	13.6	11.5	12.3	12.0	
No	87.0	83.8	86.4	88.5	87.7	88.0	
Medical visit, last 12 mos	76.6	73.8	82.1	85.5	76.2	73.3	.006
Hospitalization, last 12 mos	6.8	6.8	7.3	9.3	6.6	7.3	.794
Dental visit, last 12 mos	35.9	37.7	30.9	37.6	36.0	26.9	.220
Sought the same health service	60.8	53.4	53.3	30.6	64.3	83.1	<.001
Hypertension	19.7	20.7	21.5	20.9	19.1	29.4	.386
Diabetes	6.2	7.3	6.0	9.0	5.7	12.3	.150
Hypercholesterolemia	14.9	15.1	15.3	14.4	14.8	17.0	.992

Table 2. Prevalence ratios of health services utilization and chronic diseases among Black, Yellow, Brown and Indigenous respondents compared with White respondents

Variables	Black		Yellow		Browns		Indigenous	
	PR (95% CI)	P	PR (95% CI)	P	PR (95% CI)	P	PR (95% CI)	P
Health insurance coverage	.83 (.60-1.17)	.293	.70 (.43-1.14)	.152	.76 (.62-.93)	.007	.73 (.31-1.71)	.472
Medical visit in last 12 months	1.12 (1.04-1.20)	.002	1.13 (1.04-1.22)	.005	1.03 (.98-1.08)	.315	.96 (.80-1.16)	.694
Hospitalization in last 12 months	1.13 (.69-1.85)	.620	1.24 (.69-2.22)	.465	.98 (.71-1.35)	.904	1.06 (.35-3.22)	.915
Dental visit in last 12 months	.86 (.71-1.05)	.130	.99 (.79-1.25)	.955	.98 (.87-1.09)	.677	.80 (.48-1.31)	.374
Sought for the same health service	1.00 (.88-1.13)	.953	.55 (.42-.71)	<.001	1.19 (1.10-1.29)	<.001	1.48 (1.28-1.72)	<.001
Hypertension	.94 (.74-1.20)	.610	.87 (.64-1.20)	.400	.84 (.72-.98)	.031	.98 (.61-1.59)	.944
Diabetes	.69 (.41-1.17)	.169	1.04 (.59-1.85)	.889	.69 (.51-.94)	.019	1.04 (.43-2.52)	.935
Hypercholesterolemia	.91 (.67-1.24)	.564	.80 (.54-1.19)	.275	.89 (.73-1.07)	.211	.77 (.39-1.53)	.461

PR, prevalence ratio; CI, confidence interval.

($P < .001$). Hypertension (29.4%), diabetes (12.3%), and hypercholesterolemia (17.0%) were more frequently self-reported by Indigenous people than other ethnic groups, although without significance ($P > .05$).

Browns had less health insurance coverage (PR = .76; 95% CI: .62-.93) and reported hypertension (PR = .84; 95% CI: .72-.98) and diabetes (PR = .69; 95% CI: .51-.94) less frequently than Whites (Table 2). Blacks and Yellows visited a physician more than Whites in the previous year ($P \leq .005$). Browns and Indigenous people usually sought the same service when a health service was needed compared with Whites ($P < .001$). There was no significant difference across ethnic groups in the dental office visits and hospital admissions during the last 12 months.

DISCUSSION

Browns, a mixed-race and the more predominant ethnic group in the Manaus Metropolitan Region, had less health insurance coverage but

lower prevalence of diabetes and hypertension, compared with Whites. Also compared with Whites, Yellows sought medical services more frequently over the previous year. Indigenous people had the highest frequency of chronic diseases among the ethnic groups, but this finding was not statistically significant. The low number of self-identified Indigenous people in the study group likely reduced the statistical power to allow significance.

Similar to the 2013 Brazilian National Health Survey, Browns had more chronic diseases compared with Whites.² The awareness of the disease depends on a previous medical diagnosis. Although Brazil has a public and universal health system, Browns had less health insurance than Whites.¹¹ Another possible social determinant is the sedentary behavior promoted by motor vehicles that Whites are more able to own due to their higher social status. Yellows, who have similar social status to Whites, visited a doctor more frequently than Whites and no differences in prevalence of diseases was observed among them.

The North is one of the regions with the lowest health insurance coverage in Brazil.¹¹ In 2008, 34.9% of the White population and 17.2% of the Black and Brown population had a private health insurance plan.¹² The percentage of Blacks with health insurance coverage remains low despite increasing over the past several years.¹² In the United States, where the health care system is not universal, disparities are noted in health insurance coverage between Whites and other ethnic groups.¹³

Compared with Whites, Indigenous people more often seek the same health service to attend to their health needs. This result is probably related to national policies in the field that took place in the 2000s when specialized health assistance was decentralized for Indigenous peoples in the whole country.¹⁴ This connection to a particular health service may potentially improve the quality of health care. Despite this new policy, Indigenous people did not have higher utilization rates of health services than Whites.

Indigenous people presented with the highest prevalence of hypertension, hypercholesterolemia, and diabetes, which was not significant compared with Whites in the adjusted analysis. Population-based surveys of different Indigenous groups across Brazil consistently show high prevalence of overweight, obesity, hypertension, diabetes, metabolic syndrome and dyslipidemia.¹⁵⁻²¹ A national survey of more than 6,000 Indigenous children (aged <5 years) in 2009 observed that more than a quarter of the children presented stunting. Most of the children were from the northern area of Brazil; this rate of stunting was similar to non-Indigenous Brazilian in the 1980s.²² Such nutritional problems are probably the cornerstone of chronic diseases in adult Indigenous people.

In Brazil a decrease in malnutrition and an increase in overweight and obesity have been observed over the last decades.²³ The nutrition transition process, which is prompted by the change from a primarily rural population to the status of an urban nation with regional income inequities, is a known cause.²⁴ Furthermore, the transition of a labor force from the primary economic sector (agriculture, animal husbandry and extractive activities) to a labor concentrated on secondary (manufacturing) and tertiary (business and services) sectors has resulted in less physical effort during work activities.²⁴

For Indigenous populations, embracing urban lifestyles often leads to the deterioration of eating habits and lifestyle behaviors as individuals change from subsistence hunting, fishing, and farming to consuming industrialized foods and adopting a

sedentary lifestyle. In 2007, Oliveira et al found that the use of motor boats reduced the frequency of long river travels in rowing boats among Indigenous adults from Alto Xingu, central Brazil, with a subsequent decrease in the routine level of physical activity.¹⁹

Although northern Brazil has a large population of Indigenous individuals, there is a paucity of studies

Browns, a mixed-race more frequently identified in the Manaus Metropolitan Region, had less health insurance coverage but lower prevalence of diabetes and hypertension, compared with Whites.

assessing the non-communicable diseases in this ethnic minority group in the Manaus Metropolitan Region. Our study has added findings on disease rates and access to health services in the hopes that this information can stimulate efforts to reduce inequities in access to public or private health services between ethnic groups, especially between Indigenous and non-Indigenous populations.

Study Limitations

We experienced some difficulties in conducting the study, such

as closed or empty housing units and residents refusing to talk to the interviewer. Furthermore, the subjectivity of the responses and faulty understanding of questions by respondents may have caused relevant limitations. This limitation is inherent to questionnaire-based surveys, such as our study. The main findings of our study —prevalence of non-communicable diseases by ethnicity — relied on self-reported data for three non-communicable chronic conditions, related to cardiovascular and metabolic systems only.²⁵ We did not address lifestyle variables such as physical activity, diet, smoking, and drinking behaviors, which would improve our understanding of the results. Additionally, the cross-sectional design of the study made it impossible to establish causal relationships. Longitudinal studies are warranted to further explore the associations found in this study. However, the projected sample size was reached in a representative population, and the factors concerning the health of residents in metropolitan Manaus were investigated in-depth.

CONCLUSION

The Indigenous population had the highest prevalence of self-reported hypertension, diabetes and hypercholesterolemia among the ethnic groups of Manaus Metropolitan Region. Browns, Brazilian mixed-race and the more predominant group of the region, had lower prevalence of diabetes and hypertension when compared with Whites, but less health insurance coverage.

ACKNOWLEDGMENTS

The study was approved by the Federal University of Amazonas Research Ethic Committee (process 974,428/2015, CAAE 42203615.4.0000.5020). This work was supported by National Council for Scientific and Technological Development (grants 404990/2013-4 and 448093/2014-6).

CONFLICT OF INTEREST

No conflicts of interest to report.

AUTHOR CONTRIBUTIONS

Research concept and design: Galvao, Silva; Acquisition of data: Galvao, Silva; Data analysis and interpretation: Alencar, Antonio, Silva; Manuscript draft: Alencar, Galvao, Silva; Statistical expertise: Silva; Acquisition of funding: Silva; Administrative: Alencar, Antonio; Supervision: Galvao, Silva

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