

Racial inequalities in the socioeconomic, demographic and health conditions of elderly from Maranhão State, Legal Amazon, Brazil: a population-based study

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ABSTRACT

Aging with quality of life does not occur equally among the racial groups of Brazilian elderly, and few studies have analyzed this issue in the states of the Brazilian Legal Amazon. The objective of this study was to investigate racial inequalities in the socioeconomic, demographic and health conditions of elderly residents of Maranhão state, Brazil. The present work is a cross-sectional study of 450 elders aged 60 years or older included in the 2008 National Household Sample Survey. The prevalence of socioeconomic, demographic, health and habit indicators and of risk factors were estimated in white, brown and black racial categories that were self-reported by the survey participants. The chi-square test was used for comparisons ($\alpha=5\%$). The majority of the elderly respondents identified themselves as brown (66.4%) or white (23.3%). There were significant socioeconomic, demographic, habit and lifestyle differences among the racial groups. Most of the black and brown elderly lived alone, reported lower educational levels and were in the lowest quintile for income. These respondents were also highly dependent on the Unified Health System (Sistema Único de Saúde – SUS), exhibited low rates of screening mammograms and lower physical activity levels and had a greater proportion of smokers. However, there was no difference in the prevalence of health indicators or in the proportion of elderly by gender, age, social role in the family or the urban-rural location of the household. These results indicate the presence of racial inequalities in the socioeconomic and demographic status and in the practice of healthy habits and lifestyles among elderly from Maranhão, but suggest equity in health status. The results also suggest the complexity and challenges of interlinking race with socioeconomic aspects, and the findings reinforce the need for the implementation of public policies for these population groups.

KEYWORDS: aging, social inequity, epidemiology, indicators, race or ethnic group distribution.

Desigualdades raciais na condição socioeconômica, demográfica e de saúde dos idosos do Estado do Maranhão, Amazônia Legal, Brasil: um estudo de base populacional

RESUMO

O envelhecimento com qualidade de vida não ocorre de modo equitativo nos grupos raciais de idosos brasileiros e poucas pesquisas analisam este tema nos Estados da Amazônia Legal. O objetivo desta pesquisa foi investigar desigualdades raciais na condição socioeconômica, demográfica e de saúde de idosos maranhenses. Trata-se de estudo transversal envolvendo 450 idosos com 60 anos ou mais incluídos na Pesquisa Nacional por Amostra de Domicílios 2008. Estimaram-se prevalências para indicadores socioeconômicos, demográficos, de saúde e de hábitos e fatores de risco, segundo as categorias raciais branca, parda ou preta autorreferidas. Utilizou-se o teste Qui-quadrado nas comparações ($\alpha=5\%$). A maioria dos idosos referiu-se como pardos (66,4%) ou brancos (23,3%). Observaram-se significativas diferenças socioeconômicas, demográficas e nos hábitos e estilos de vida entre os grupos raciais. Idosos pretos e pardos, em maior proporção, moravam sozinhos, referiram menor escolaridade e estavam no pior quintil de renda. Apresentaram, também, elevada dependência do Sistema Único de Saúde, baixa realização de mamografia, menor prática de atividade física e maior proporção de fumantes. Contudo, não houve diferença nas prevalências dos indicadores de saúde nem na proporção de idosos segundo o gênero, faixa etária, papel social na família e localização urbano-rural do domicílio. Estes resultados indicam a presença de desigualdades raciais na condição socioeconômica, demográfica, na adesão a hábitos e estilos de vida saudáveis, mas sugerem equidade em saúde. Apontam a complexidade e os desafios do entrecruzamento da raça com aspectos socioeconômicos e reforçam a necessidade da implementação de políticas públicas voltadas para estes grupos populacionais.

PALAVRAS-CHAVE: envelhecimento, iniquidades sociais, epidemiologia, indicadores, distribuição por raça ou etnia.

INTRODUCTION

Population aging with quality of life is one of the great challenges of contemporary public health because it does not occur in a fair and homogeneous way in the different subgroups of elderly (Jardim *et al.* 2006; Alencar *et al.* 2010). In Brazil, the proportion of elderly population is increasing in an intensive and accelerated way in all regions and states of the Federation, but this population is still characterized by the unequal distribution of risk and protective factors and health problems among the racial groups of elderly residents in these areas (Rebouças *et al.* 2011; Oliveira 2013).

Studies reveal that elderly black and brown Brazilians exhibit worse general living conditions and health status compared to the elderly white population (Rebouças e Pereira 2008; Oliveira 2013). These racial inequalities would be generated throughout the various life stages until old age through complex interactive mechanisms of color/race with markers of social status, which would be expressed in the individual and contextual indicators that are widely used to assess and monitor the social and health profiles of the elderly (Rebouças e Pereira 2008; Oliveira 2013).

However, there is currently little information on racial inequalities during the aging of residents of the states that compose the Brazilian Legal Amazon, thus limiting the determination of the local situation of racial groups of elderly in this important macro-region (Araújo *et al.* 2010; Rebouças *et al.* 2011; IBGE 2011a).

This evaluation is particularly important in Maranhão state, Brazil, because this state has the largest number and percentage of elderly residents in the Brazilian Legal Amazon. In 2010, this state had 568,681 elderly people, which represented 8.6% of its general population and 30.1% of the elderly in the Brazilian Legal Amazon. Additionally, Maranhão is the Brazilian state with the third highest proportion of African descents, is the second poorest state in the Federation and is still in the intermediate stage of demographic and epidemiological transition (IBGE 2011a; PNUD 2013). Therefore, it is hypothesized that striking racial inequalities occur in the socioeconomic, demographic and health conditions among the elderly in this Brazilian state.

Although previous studies have already indicated serious social inequalities in the general living condition in Maranhão state (IBGE 2010; Oliveira *et al.* 2010), few studies have evaluated the presence of racial inequalities and their current impacts on racial composition and socioeconomic, demographic and health conditions in elderly residents of Maranhão state (Oliveira *et al.* 2010; Oliveira 2013). Thus, the racial gradients in the general living conditions and health status of the elderly living in part of the Brazilian Legal Amazon are still unknown. The aim of this study

was to investigate the presence of racial inequalities in the socioeconomic, demographic and health conditions of elderly residents of Maranhão state, Brazil.

MATERIALS AND METHODS

The study has a cross-sectional design, and the National Household Sample Survey (Pesquisa Nacional por Amostra de Domicílios - PNAD), conducted in 2008 by the Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatística - IBGE), was used as the data source. The PNAD is a population-based survey that is conducted annually. Each year, information representative of the Brazilian population is collected. In 2008, a health supplement was added, and informations about the living conditions and health status of Brazilians were obtained. The PNAD uses a complex probability sample of households from all Brazilian regions obtained during up to three selection stages (IBGE 2008).

Only municipalities of Maranhão state were included in the present study. The municipalities were selected in the first stage of the sampling. The census sectors were selected in the second stage, and finally, households were sampled in each census sector in the last stage (IBGE 2008). A total of 7,287 individuals from 1,841 households of Maranhão state were surveyed. Of these individuals, 630 individuals were 60 years or older. Elderly whose information about color/race was reported by others ($n=173$) and elderly belonging to the yellow ($n=05$) or indigenous ($n=01$) color/race categories or with a non-reported category ($n=01$) were excluded from the study. Thus, the final population analyzed in this study consisted of 450 elderly, who identified themselves as white, brown or black (IBGE 2008). Thus, the IBGE criterion that recommends the use of self-reported color/race in health studies was adopted (Travassos and Williams 2004; IBGE 2011a).

In the PNAD, the classification of color or race is synonymous. The interviewees are encouraged to represent their race when referring to their skin color. Thus, the question about color/race reveals the racial group with which the individuals identify themselves (Travassos and Williams 2004; IBGE 2011a). However, in Brazil, this pattern of racial classification combines phenotypic and socioeconomic aspects. Depending on the individual or contextual features, the formed racial groups might not be homogeneous, and individuals do not always belong to the groups in a definite and unequivocal manner (Travassos and Williams 2004; Maio *et al.* 2005).

In this study, demographic, socioeconomic, health and habit indicators and risk factors were used, taking as a reference a matrix of indicators widely used to assess the living conditions and health status of Brazilian elderly (Rebouças e Pereira 2008; Rebouças *et al.* 2011). The following

demographic indicators comprised this study: gender (male or female), age (in completed years grouped into three age groups: 60-69, 70-79 and ≥ 80 years); role in the family (grouped into three categories: head of household, spouse and others); number of household members (grouped into three categories: 1, 2 and ≥ 3 persons); location of the residence (urban or rural).

The following socioeconomic indicators were considered: educational level (years of schooling grouped into three levels: 0, 1-8 and ≥ 9 years); economic activity status (active or inactive); quintile of the *per capita* household income (grouped in five quintiles: 1st [lowest], 2nd, 3rd, 4th and 5th [highest]), where the median income in the 1st quintile was R\$ 114.50, and the income in the 5th quintile was R\$ 1,241.50. The minimum wage in 2008 was R\$ 415.00 (approximately US\$ 226.65).

The following health indicators were considered: self-assessment of general health status (grouped into five response categories: very good, good, fair, poor and very poor); functional disability (grouped into three categories: none, small and moderate); and number of chronic diseases and conditions (grouped into three categories: 0, 1 and ≥ 2). The number of chronic diseases and conditions was obtained by the sum of all the diseases investigated in the PNAD.

The following habit indicators and risk factors were considered: having private health insurance (yes or no); *screening mammograms* (grouped into four categories: less than 1 year, 1-3 years, over 3 years and never had it); cervical cancer prevention (grouped into three categories: up to 1 year, over 1 year and never had it); physical activity practice in commuting to work or leisure (yes or no) and current smoking habit (yes or no).

The qualitative variables were expressed as absolute and percentage frequencies. The prevalence and the respective 95% confidence interval (95% CI) of the study variables according to race/color categories were estimated. To compare the frequencies of the indicators among racial groups, the chi-square test with the Rao-Scott approximation was used. A significance level of 5% was adopted. The Rao-Scott test corrects the chi-square test for a complex sample design. All of the analyses were performed in the Stata *software* version 10.0 (Stata Corp., College Station, Texas, EUA)*, incorporating the complex design effect (deff) (Silva *et al.* 2002) of the PNAD 2008 through the *svy* procedures.

RESULTS

This study included a sample of 450 elderly from Maranhão state, of which 66.4% (95% CI: 61.9-70.7) declared themselves as brown, 23.3% (95% CI: 19.6-27.5) as white, and 10.3% (95% CI: 7.7-13.4) as black. The median age was 68 years (64-74). According to the table 1, elderly women in the age group of 60-69 years, who represented the head of household and who lived in urban areas were more prevalent in the three racial groups but without significant differences among the groups. However, the number of household members differed among the racial groups ($p=0.005$). The proportion of the black elderly who lived alone was three times higher than in the other racial groups. Most of the brown and white elderly lived in households with three or more people.

The brown and black elderly exhibited lower educational levels than the white elderly ($p \leq 0.0001$). The proportion of white elderly with nine or more years of schooling was twofold higher than that of the black elderly. The proportion of brown and black elderly in the worst quintile of *per capita* household income was higher than that of the white elderly ($p=0.0002$). The proportion of white elderly in the best quintile of household income was almost fivefold higher than that observed for the brown elderly (Table 2).

There were no significant differences among the health indicators according to the racial categories evaluated. However, the black elderly displayed a higher proportion of individuals self-assessing their health status as very poor and their functional disability as small; the brown elderly exhibited more chronic diseases or conditions (Table 3).

The proportion of individuals that had private health insurance was significantly different among the racial groups ($p \leq 0.0001$). The brown and black elderly depended almost exclusively on the Unified Health System (Sistema Único de Saúde - SUS). The majority of the brown and black elderly women had never had a mammography, which was different from the pattern observed among the white elderly women ($p \leq 0.01$). Physical inactivity and a lack of smoking habit were common in all three of the groups, but the white elderly practiced more physical activity ($p=0.04$) and smoked less than the black and brown elderly ($p=0.05$) (Table 4).

Table 1. Demographic indicators of elderly residents of Maranhão state aged 60 years or older (n=450) who self-reported their race/color, PNAD 2008.

Indicators	White (n=105)		Brown (n=299)		Black (n=46)		p-value ^a
	%	(95% CI)	%	(95% CI)	%	(95% CI)	
Gender							
Male	37.1	(28.4-46.8)	45.2	(39.6-50.9)	45.7	(31.9-60.1)	0.35
Female	62.9	(53.2-71.6)	54.8	(49.2-60.4)	54.3	(39.9-68.1)	
Age group (years)							
60-69	53.3	(43.8-62.7)	57.5	(51.8-63.0)	56.5	(42.0-70.0)	0.78
70-79	38.1	(29.3-47.8)	32.5	(27.4-38.0)	30.5	(18.9-45.1)	
≥80	8.6	(4.5-15.7)	10.0	(7.1-14.0)	13.0	(6.0-26.2)	
Role in the family							
Head of household	66.6	(57.1-75.0)	70.9	(65.5-75.8)	76.1	(61.7-86.3)	0.81
Spouse	24.8	(17.4-33.9)	22.4	(18.0-27.5)	17.4	(8.9-31.2)	
Other	8.6	(4.5-15.7)	6.7	(4.4-10.2)	6.5	(2.1-18.4)	
Number of household members							
1	10.5	(5.9-18.0)	11.4	(8.2-15.5)	30.4	(18.9-45.1)	0.005
2	25.7	(18.2-34.9)	20.4	(16.2-25.4)	19.6	(10.5-33.6)	
≥3	63.8	(54.2-72.4)	68.2	(62.7-73.3)	50.0	(35.9-64.1)	
Location of the residence							
Urban	64.8	(55.2-73.3)	63.5	(57.9-68.8)	65.2	(50.5-77.5)	0.96
Rural	35.2	(26.7-44.9)	36.5	(31.2-42.1)	34.8	(22.5-49.5)	

^aChi-square test

Table 2. Socioeconomic indicators of elderly residents of Maranhão state aged 60 years or older (n=450) who self-reported their race/color, PNAD 2008.

Indicators	White (n=105)		Brown (n=299)		Black (n=46)		p-value ^a
	%	(95% CI)	%	(95% CI)	%	(95% CI)	
Educational level (years)							
0	44.8	(35.5-54.4)	62.9	(57.2-68.2)	65.2	(50.5-77.5)	0.0001
1-8	35.2	(26.7-44.9)	34.1	(28.9-39.7)	23.9	(13.7-38.3)	
≥9	20.0	(13.4-28.8)	3.0	(1.6-5.7)	10.9	(4.6-23.7)	
Economic activity							
Active	33.3	(25.0-42.9)	34.4	(29.3-40.0)	37.0	(24.3-51.7)	0.91
Inactive	66.7	(57.1-75.0)	65.6	(60.0-70.7)	63.0	(48.3-75.7)	
Quintile of the household income ^b							
1st (R\$114.50)	8.7	(4.6-15.8)	13.8	(10.3-18.2)	13.0	(6.0-26.2)	0.0002
2nd	22.1	(15.1-31.1)	22.9	(18.5-28.0)	13.0	(6.0-26.2)	
3rd	31.7	(23.5-41.3)	46.1	(40.5-51.8)	52.2	(37.9-66.1)	
4th	19.2	(12.7-28.0)	13.1	(9.7-17.5)	10.9	(4.6-23.6)	
5th (R\$1,241.50)	18.3	(11.9-26.9)	4.1	(2.3-7.0)	10.9	(4.6-24.0)	

^aChi-square test; ^bFor the quintile of the household income, 104 white and 297 brown respondents were analyzed.

Table 3. Health indicators of elderly residents of Maranhão state aged 60 years or older (n=450) who self-reported their race/color, PNAD 2008.

Indicators	White (n=105)		Brown (n=299)		Black (n=46)		p-value ^a
	%	(95% CI)	%	(95% CI)	%	(95% CI)	
Self-assessment of the health status							
Very good	4.8	(2.0-11.0)	2.3	(1.1-4.8)	4.3	(1.1-15.9)	0.23
Good	30.4	(22.4-39.9)	30.8	(25.8-36.2)	43.5	(30.0-58.0)	
Fair	42.9	(33.7-52.5)	44.8	(39.2-50.5)	34.8	(22.5-49.5)	
Poor	20.0	(13.4-28.8)	16.7	(12.9-21.4)	8.7	(3.3-21.0)	
Very poor	1.9	(0.5-7.3)	5.4	(3.3-8.6)	8.7	(3.3-21.0)	
Number of chronic conditions							
0	36.2	(27.6-45.8)	35.8	(30.5-41.4)	36.9	(24.3-51.7)	0.32
1	28.6	(20.7-38.0)	37.1	(31.8-42.8)	41.4	(28.1-55.9)	
≥2	35.2	(26.7-44.9)	27.1	(22.3-32.4)	21.7	(12.1-36.0)	
Functional disability							
None	80.0	(71.2-86.6)	82.6	(77.9-86.5)	78.3	(64.1-87.9)	0.45
Small	12.4	(7.3-20.2)	12.0	(8.8-16.3)	19.5	(10.5-33.6)	
Moderate	7.6	(3.9-14.5)	5.4	(3.3-8.6)	2.2	(0.3-14.0)	

^aChi-square test

Table 4. Life-habit indicators and risk factors of elderly residents of Maranhão state aged 60 years or older (n=450) who self-reported their race/color, PNAD 2008.

Indicators	White (n=105)		Brown (n=299)		Black (n=46)		p-value ^a
	%	(95% CI)	%	(95% CI)	%	(95% CI)	
Have health insurance							
No	83.8	(75.4-89.7)	96.7	(93.9-98.2)	97.8	(86.0-99.7)	0.0001
Yes	16.2	(10.3-24.6)	3.3	(1.8-6.1)	2.2	(0.3-14.0)	
Mammography ^b							
Less than 1 year	21.2	(12.9-32.8)	11.0	(7.0-16.8)	16.0	(6.1-35.9)	0.01
1 to 3 years	25.8	(16.6-37.7)	14.6	(10.0-20.9)	4.0	(0.6-23.8)	
Over 3 years	10.6	(5.1-20.7)	14.6	(10.0-20.9)	4.0	(0.6-23.8)	
Never had it	42.4	(31.1-54.6)	59.8	(52.0-67.0)	76.0	(55.7-88.9)	
Cervical cancer prevention ^b							
Up to 1 year	30.3	(20.4-42.5)	22.0	(16.2-29.0)	16.0	(6.1-35.8)	0.28
Over 1 year	47.0	(35.2-59.0)	45.1	(37.6-52.8)	40.0	(23.0-59.9)	
Never had it	22.7	(14.1-34.4)	32.9	(26.1-40.5)	44.0	(26.2-63.5)	
Practice of physical activity in commuting to work or leisure							
Yes	14.9	(7.3-20.2)	6.4	(3.3-8.8)	5.1	(1.1-15.7)	0.04
No	85.1	(71.2-86.6)	93.6	(89.9-99.2)	94.9	(87.1-99.7)	
Current smoking habit							
Yes	9.5	(5.0-17.3)	17.5	(13.3-22.8)	25.0	(14.0-40.6)	0.05
No	90.5	(82.7-95.0)	82.5	(77.2-86.7)	75.0	(59.4-86.0)	

^aChi-square test; ^bThe denominator of these indicators included the total number of women (n=255).

DISCUSSION

These results suggest significant and unfair racial inequalities in the socioeconomic and demographic conditions and the health habits of elderly aged 60 years or older from the Brazilian state of Maranhão in 2008. The general living conditions and health status of the elderly analyzed in this study (born between 1914 and 1948) exhibited differences in the distribution of risk and protective factors. The brown and black elderly lived in worse socioeconomic conditions, having more dependence on public health systems, lower use of mammography service and lower adherence to healthy lifestyle practices. These racial differences may partially arise from unequal access and use of resources and social and health care services, which would indicate social rights denied throughout the various life stages until the elderly stage (Clarke and Smith 2011; Oliveira 2013).

However, the estimates of the health indicators, self-assessment of general health status, number of chronic diseases and conditions and functional disability did not vary among the racial groups. The absence of racial differences in health can be explained by the low direct effect of race on health in the context of poor socioeconomic status. This result suggests that socioeconomic inequalities might have a more significant direct effect on the health of the elderly than the inequalities generated by color/race (Campos 2009; Borim *et al.* 2012). However, it is likely that the variable color/race generates *hierarchization* and social implications, and therefore, this variable would be at the beginning of the chain of effects of socioeconomic differences (Chor 2013).

The racial composition of the elderly population of Maranhão state was different from the Brazilian elderly population included in the censuses of 2000 and 2010 (IBGE 2011b). Previous studies have reported a particular dynamic in the racial composition in Brazil, suggesting that the elderly population has become *ethno-racially* more diverse than observed in other countries (Clarke and Smith 2011; Oliveira 2013). However, in Maranhão state, this *ethno-racial* diversity is more intense but with a higher proportion of black elderly. In the present study, the proportion of black elderly was higher than that observed in the Brazilian states of Ceará, Minas Gerais, Rio de Janeiro and São Paulo (Rebouças *et al.* 2011), but similar to that of African descendants in Pará and Bahia, which were the Brazilian states with the highest proportion of blacks in 2010, representing almost 77.0% of the population (IBGE 2011a). Some authors consider that this pattern of racial composition in the North and Northeast regions is due to a regional project that was structured in settlement policies and a slavery-based agricultural economy (Gomes 2001; Guimarães 2004). This structure promoted a concentrated miscegenation, fusion and expressive interaction

of the racial groups in these locations, especially in Maranhão state, which remains until the present day (Gomes 2001).

Significant differences in the number of household members among the three analyzed racial groups were observed. In the present study, the proportion of black elderly who lived alone was almost four times higher than that of the general population of Maranhão state surveyed in 2010 by the IBGE (IBGE 2011b), suggesting that in this state, one-person families are more common among the elderly. Previous studies have reported an increase in the elderly population living alone but with important differences among the regions of the country (Oliveira *et al.* 2010; Camargos *et al.* 2011). A significant portion of these elderly is formed of women who are poor, with chronic diseases and low educational levels and who live in areas with poor infrastructure (Junges 2004; Camargos *et al.* 2011). Thus, living alone in old age can be a concern because elderly need more support, and the family is still the main provider of support in this stage of life (Camargos *et al.* 2011).

Regarding the distribution pattern of the socioeconomic status, the brown and black elderly still exhibited the worst educational and household income levels compared to the white elderly. These findings are similar to those observed in other studies and reveal the overlapping of brown and black elderly with the proportion of individuals who are poor and with the worst educational level (Clarke and Smith 2011; Oliveira 2013). This situation of inequality indicates that these elderly form a group that is vulnerable to risks that lead to disadvantages in lifestyles (Neri and Soares 2007; Lima-Costa *et al.* 2011). This pattern also suggests that the disparities in the present general living conditions originated from the denied social rights and multiple deprivations accumulated during each life stage until old age (Barros *et al.* 2011a; Lima-Costa *et al.* 2012; Oliveira 2013). Moreover, these differences can be reproduced in family members of these individuals because the income of the elderly may represent an important part of the household income (Neri and Soares 2007; Campos 2009), especially in poorer families where the elderly contribute an important fraction of the family income (Junges 2004; Neri and Soares 2007). In this study, it is likely that this condition also occurred because most of the elderly of the three evaluated racial groups reported themselves as the main breadwinner for their families.

The health indicators used on this study allow the assessment and monitoring of the health of the elderly in a more consistent manner, and these indicators are closer to the current complex concept of health (Campos 2009; Lima-Costa *et al.* 2012). The results of the present study did not reveal racial gradients in these indicators. In Brazil, there is still no consensus about the presence of racial inequalities in the distribution of these healthcare measures. Some studies did

not find a racial gradient (Campos 2009; Borim *et al.* 2012), while such a gradient was present in other studies (Campos 2009; Barros *et al.* 2011b; Oliveira 2013). However, questions about the role of race/color in determining health status are still common in these studies. This question is due to doubts about whether racial differences are relevant in health as an independent risk factor or are merely a consequence of the worse socioeconomic indicators exhibited by blacks compared to whites (Travassos and Williams 2004; Araújo *et al.* 2010). These questions remain because Brazil is a complex country, persisting as one of the higher levels of social inequalities worldwide (Araújo *et al.* 2010; PNUD 2013) and has a latent myth of racial democracy (Guimarães 2004; Lucena 2008). However, it is possible that health inequalities among the elderly from Maranhão state reflect broader inequalities in the society (Chor 2013). Although there were no racial differences in the health of the elderly in this study, it is believed that the variable color/race indirectly influences the health of these individuals, at least partially, by determining worse socioeconomic status for brown and black elderly (Campos 2009; Barros *et al.* 2011b; Borim *et al.* 2012).

The assessment of life-habit indicators and risk factors is essential to analyze the health status and to control risks and damages of populations (Malta *et al.* 2011; Rebouças *et al.* 2011). A set of these risk factors accounts for a large portion of the deaths from chronic degenerative diseases. Smoking, physical inactivity and inappropriate access to and use of healthcare services are included among those risk factors (Malta *et al.* 2011). The present study found racial differences in health-insurance coverage and rates of screening mammograms. These findings are consistent with the results of other authors (Viacava *et al.* 2009; Oliveira *et al.* 2011; Oliveira 2013). Having a health-insurance plan had different impacts among the analyzed groups. The high percentages of brown and black elderly with exclusive dependence on SUS suggest the importance of this system for reducing social inequities in health, especially for disadvantaged elderly populations (Barros *et al.* 2011a; Lima-Costa *et al.* 2012). White elderly have a highest rate of health-insurance, indicating that these individuals have a higher level of health care due to the possibilities of using both public and private services (Barros *et al.* 2011a; Lima-Costa *et al.* 2012). Additionally, the rates of the use of mammography services by black and brown elderly women from Maranhão state in 2008 were significantly lower than the rates among the white elderly. This value was lower than the estimated rates in 2003 and 2008 for Brazilian women above 25 years of age (Oliveira *et al.* 2011) and the rates for women aged 50-69 years old in the city of São Luís (capital of Maranhão state) in 2003 and 2007 (Viacava *et al.* 2009) as well as for elderly women from the states of Minas Gerais, Rio de Janeiro and São Paulo, but the usage was higher than that of elderly women from the

state of Ceará (Rebouças *et al.* 2011). Unlike the patterns observed in some regions of Brazil in recent years, access to mammography services was not available to all racial groups of elderly residents of Maranhão state. Although there are differences in the age groups of the women analyzed in these studies, it is possible that the recognition of the importance of mammography among the elderly women from Maranhão state is influenced by local problems related not only to access to medical services and the exam itself but also to the comprehension of the information received by these women (Viacava *et al.* 2009; Barros *et al.* 2011a). However, it should be noted that unlike in other studies, estimates of the performance of Pap smears did not differ among the racial groups surveyed but revealed high estimates of elderly women who had never had this exam in any stage of life, indicating failures in the health system in engaging women and timely diagnosing cervical cancer (Gonzaga *et al.* 2013).

Another important indicator assessed among the elderly residents of Maranhão state was a present smoking habit. Smoking is related to the development of several chronic diseases, and its control is the main way to reduce the occurrence of various types of tobacco-related cancers (Zaitune *et al.* 2012; Malta *et al.* 2013). Smoking is the most important risk factor for seven of the 14 main causes of death among the elderly (Zaitune *et al.* 2012) and increases the expenses of medical and social care in this group (Zaitune *et al.* 2012; Malta *et al.* 2013). In the present study, there was a well-defined and increasing gradient in the prevalence of smokers among the racial groups of the elderly. This habit was significantly more prevalent among the non-white elderly. This prevalence was higher than the one found in a population-based study of 1,954 elderly from four areas of São Paulo state, of which 16.8% were smokers (Zaitune *et al.* 2012). One possible explanation for the difference in prevalence between these surveys might be population and regional socioeconomic differences between the study sites; the smoking habit might be even more frequent among non-white elderly from Maranhão state because this population exhibits lower income and educational levels compared to the individuals from São Paulo State (Zaitune *et al.* 2012; Malta *et al.* 2013).

The practice of physical activity has been increasingly recognized as producing physical, psychological and social benefits (Zaitune *et al.* 2010; Malta *et al.* 2011). In the elderly, this practice helps to maintain independence, a healthier lifestyle and a higher quality of life (Zaitune *et al.* 2010; Malta *et al.* 2011). In the present study, the practice of physical activity when commuting to work or during leisure was lower than that observed in other population-based studies of elders, regardless of the racial classification (Zaitune *et al.* 2010). The practice of physical activity had a prevalence of

18.4% of the non-white elderly from four areas of São Paulo state (Zaitune *et al.* 2010), which was significantly higher than the proportion observed in the black and brown elderly residents of Maranhão. Such differences may result from the poorer socioeconomic status, high functional dependency, absence of inclusion in economic activity and contextual features that reduce the practice of physical activity among the analyzed elderly population (Junges 2004; Zaitune *et al.* 2010). Therefore, actions that encourage the practice of physical activity among groups of sedentary and vulnerable individuals should be instituted.

It is worth noting some limitations of this study. The cross-sectional design makes it difficult to infer the temporality in the estimates. Bias regarding prevalence and survival in the estimates based on the PNAD data might have occurred. This bias occurs because elderly with lower socioeconomic status have lower survival (Lima-Costa *et al.* 2012) or because institutionalized elderly (less healthy) are excluded from the PNAD sample (IBGE 2008). The use of information obtained by the administration of questionnaires may have added a memory bias to the measurement of physical activity and other variables (Zaitune *et al.* 2010). Moreover, there are conceptual and methodological limitations associated with the strategy of self-reporting racial categories, frequently cited to produce weak and underestimated results in studies with racial topics (Maio *et al.* 2005; Lucena 2008).

However, the results of this study were obtained from a population-based probability sample of elderly residents of Maranhão state, with good accuracy for local and national populations (Lima-Costa *et al.* 2011). The estimates are representative of the elderly population of the Brazilian Legal Amazon region because one third of the elderly of this region is in Maranhão state (IBGE 2008; IBGE 2011b). Furthermore, in this study, only the elderly who self-reported their color/race in the categories suggested by the IBGE were considered (2011b). Because racial identity may be influenced by socioeconomic, political and biological mechanisms in Brazil (Travassos and Williams 2004; IBGE 2011a), the use of self-reported color/race reduced the possibility of bias of the classification of this variable and of the prevalence of the analyzed racial groups (Travassos and Williams 2004; Maio *et al.* 2005).

Finally, regardless of the racial group of the elderly, population aging is an event that impacts different dimensions of human life. Thus, the achievement of health and quality of life in old age depends not only on the care provided by family members or health professionals but also on the effective participation of the whole society (Jardim *et al.* 2006; Alencar *et al.* 2010).

CONCLUSION

The results of the present study suggest the presence of significant racial inequalities in the general living conditions among the elderly residents of the Brazilian state of Maranhão. The results also indicate that the aging process in black and brown individuals occurs under conditions of overlapping risks, socioeconomic and demographic differences and lower proportions of healthy habits and lifestyles. Although racial differences in health indicators have not been observed, it is possible that the variable color/race indirectly determines the health of these elderly by inducing the risks associated with worse socioeconomic status among black elderly. Thus, the findings of this study show the complexity and challenges on interlinking race with socioeconomic aspects and reinforce the need for the implementation of public policies for these population groups, which may make fairer the current aging process that occurs in the state of Maranhão.

ACKNOWLEDGEMENTS

This study was supported by the Fundação de Amparo à Pesquisa e ao Desenvolvimento Científico e Tecnológico do Maranhão (FAPEMA), through the Edital Apoio a Artigos Científicos. Besides, the authors thank to Professor Luís Eduardo Batista for suggestions about the analysis and for reflections about racial inequalities among the elderly of Maranhão state; and to Professor Luana Giatti for the assistance in the management and use of the PNAD 2008 database.

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Recebido em 01/09/2013

Aceito em 04/11/2013