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Changes in health behaviors in elderly Brazilians: data from the 2013 and 2019 National Health Surveys

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Abstract *Changes in health behaviors of elderly people (≥65 years old) in Brazil included in the National Health Survey 2013 (n=7,712) and 2019 (n=15,926) were analyzed. Cross-sectional study compared prevalence estimates and 95% confidence intervals (95% CI) of current and past smoking; alcohol abuse; leisure-time physical activity; consumption of fruit and vegetables. Differences were considered statistically significant at the 5% level. All positive health behaviors increased significantly over the period. The consumption of fruit and vegetables was the most prevalent, and smoking cessation the one that grew the most. The consumption of fruit and vegetables, physical activity during leisure time and alcohol abuse prevailed in the capitals, with current and past smokers prevailing in the interior. Men had higher estimates of current and past smoking and alcohol abuse. In younger women, alcohol abuse significantly increased. Leisure-time physical activity did not differ between the sexes. Women consumed more fruit at all ages and years, but vegetables depended on age and year. The prevalence of healthy behavior has increased in Brazil. However, individual and contextual inequalities have remained and affect the achievement of more positive levels of health.*
Key words *Elderly, Smoking, Diet, Alcohol consumption, Physical activity*

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Introduction

Chronic Noncommunicable Diseases (NCDs) represent the most serious public health problem for the current population and probably also in the future[1]. The heavy burden of morbidity and mortality from NCDs affects the quality of life of individuals and the sustainability of health systems[1-3]. A small group of behaviors related to risk factors such as smoking, alcohol abuse, physical inactivity and low consumption of a diet based on fruit and vegetables have determined and sustained high levels of the presence of these diseases individually or as multimorbidities[2,4-6].

The occurrence of NCDs is attributed to a combination of socio-economic, racial, cultural and political processes that have increased the adoption and maintenance of negative health behaviors and lifestyles associated with these diseases[1,4]. Behaviors related to risk factors occur through complex interdependent relationships and the extent of exposure to them changes over a lifetime[6]. Unequal life and health histories define the individual accumulation of benefits or deficits in healthy behaviors that shape the quality of each life cycle[6-8].

The prevalence and distribution of health risk behaviors depend on individual characteristics and are shaped by the context in which people live and work[7]. They can also differ depending on the type of behavior assessed[9,10] and public strategies adopted to tackle them[9]. In this respect, it is important to monitor the distribution of such potentially modifiable behaviors in the different life cycles as a means of evaluating the success of public measures adopted to tackle negative health patterns and styles[2,3,9].

The elderly are among the most socio-economically vulnerable age groups and are exposed to low levels of adherence to and maintenance of health behaviors associated with the occurrence of NCDs[3,8]. Therefore, reducing inequalities and exposure to NCD risk factors among the elderly can favor a longer healthy life expectancy[3] and active ageing[11].

Brazil has one of the most dynamic and unequal processes of population ageing in the world[8,11-13], which affects adherence to healthy behaviors and the quality of life and well-being associated with them. However, in Brazil, analyses of behaviors related to health risk factors in the elderly are investigated to a lesser extent than in the adult or general population[3,6]. Among the studies available with the elderly, there are differences in the levels of health behaviors between groups of sex, age, type of health behavior[2,5,6,14,15] or even advice on healthy habits given by health professionals[16].

Furthermore, most of the available studies are restricted to elderly people in specific contexts or cities[5,8,15,16], do not use databases representative of the entire Brazilian elderly population[8,15,16] or tend to analyze in isolation health behaviors in a specific manner and not as a whole[14]. This reality does not make it possible to understand changes in adherence to healthy lifestyles or the combined monitoring of various health behaviors in a national context and in different cities in the country. This limits the implementation of public action and social engagement focused on the needs of the elderly in order to help them maintain and increase health behaviors and healthy lifestyles throughout the later stages of life.

In this respect, data from national surveys such as the National Health Survey (NHS) 2013 and 2019 are useful for understanding and monitoring changes in the distribution of the health behaviors of elderly Brazilians over the second decade of this century.

Therefore, this study has analyzed the changes in health behaviors of the elderly in Brazil throughout the 2013 and 2019 NHS.

Methods

Type of study

This is a cross-sectional study based on secondary data collected by the National Health Survey (NHS) carried out in the years 2013 and 2019. These data were used to analyze changes in good health behaviors among elderly Brazilians over these years.

The National Health Survey (NHS)

The NHS was carried out in 2013 and 2019 by the Brazilian Institute of Geography and Statistics (IBGE) in partnership with the Ministry of Health (MS) and the Oswaldo Cruz Foundation (Fiocruz)[17,18]. This is a nationwide population-based household survey carried out with the aim of obtaining valid and representative information about the Brazilian population on a wide range of life and health indicators. The NHS 2013 target population was made up of individuals aged 18 or over and those aged 15 or over in 2019, living in permanent private households in Brazil. The survey questionnaires include ques-

tions about households and all their residents. A third part of the questions is designed to record other health information related to a resident ≥18 years of age in 2013 and ≥15 years of age in 2019 selected at random from among all the residents of the household previously selected[17-19].

The NHS uses a complex probabilistic sample of a set of selected area units (census tracts or a set of tracts that are defined as Primary Sampling Units - PSUs) from all of Brazil's Federated Units (UFs), which represents a subsample of the Master Sample that makes up the IBGE's Integrated Household Survey System (SIPD). The sampling used was probabilistic by conglomerates in three stages of selection, with stratification of the PSUs. The households represent the secondary units and the tertiary unit is the resident (≥18 years old in 2013 and ≥15 years old in 2019) selected from each household based on the list of residents, who answered the individual part of the questionnaire applied by the NHS in 2013 and 2019. The census tracts or set of tracts were initially selected by probability proportional to size for the Master Sample and by equally proportional probability for the NHS. Households and residents were selected by simple random sampling[17-19.] Further methodological details can be found in NHS publications[17-19].

Variables in the study

This study considered only individuals aged 65 or over in 2013 (n=7,712) and 2019 (n=15,926). A set of socio-economic, demographic and health behavior variables were used for the analyses. Among the socio-economic and demographic variables were: gender (male, female); age (in complete years grouped into four age groups: 65 to 69, 70 to 74, 75 to 79 and ≥80 years; color/race (white, brown, black, other); education (in levels, up to incomplete primary or equivalent, incomplete secondary or equivalent, incomplete higher education or equivalent, complete higher education); area where the household is located (urban, rural); macro-region of residence in the country, in five categories (North, Northeast, Midwest, Southeast and South); type of city within the Federated Unit (UF) (capital, metropolitan region excluding capital (MR), interior); UF (Federated Unit: 26 states and the Federal District); level of household income per capita (up to 1/2 MW, 1/2 to 1 MW, 1 to 2 MW, 2 to 3 MW, more than 3 MW). In 2013, the median income at the lowest level was R$ 268 and at the highest R$ 3,550. In 2019, the median income at the lowest level was R$ 440 and at the highest R$ 4,925.

As for health behaviors, the following variables were assessed: Smoking (yes, no): Current smoking (yes, no) and past smoking (yes, no); Alcohol abuse (yes, no) (considering the consumption of five or more measures on a single occasion, at least once in the last 30 days); Physical activity during leisure time: active (individuals who engaged in at least 150 minutes per week of light to moderate exercise or 75 minutes of vigorous exercise per week); Diet: consumption of vegetables (raw or cooked) and fruit on at least five days per week (yes, no).

Analysis

For both years of the NHS, prevalence rates and 95% confidence intervals (95%CI) were estimated for socio-economic and demographic variables and positive health behaviors. Differences in the distribution of frequencies of socio-economic and demographic variables were verified according to year, and those related to health behaviors according to year, city within the UF, gender and age. In all the analyses, the differences were considered statistically significant at the 5% level in the absence of overlapping 95%CIs, and Pearson's chi-squared test was used to confirm these differences between the 2019 and 2013 NHS surveys.

All the analyses were carried out in the RStudio software version 2022.2.3.492 (R Foundation for Statistical Computing, Boston, USA) and incorporate all the characteristics of the PNS 2013 and 2019 complex sampling plan.

Ethical aspects

The NHS 2013 and 2019 data are in the public domain and can be used for any research that is of interest. The National Research Ethics Commission (CONEP)/National Health Council (CNS) approved the NHS 2013 (opinion No. 328.159, of June 26, 2013) and 2019 (opinion No. 3.529.376 on August 23, 2019) projects, and all participants signed an informed consent form[17,18].

Results

Data were analyzed from 7,712 elderly people in 2013 and 15,926 in 2019. There was a statistically significant increase in the proportion of elderly

people interviewed as a selected resident between the NHS surveys (p<0.001). There were no differences in the median age in the period (2013: 72, 68-78; and 2019: 72, 68-78). In both years, there were higher proportions of women, younger elderly people (65 to 69 years old), white people and those with the lowest level of schooling and an income of less than 1 MW. Regarding place of residence, the majority lived in the Southeast, cities outside the capitals or metropolitan regions and in urban areas. In the analyses, there was only a statistically significant difference in the distribution of color/race, schooling and income (p<0.05) (Table 1).

Figure 1 shows the prevalence of health behaviors among the elderly Brazilians interviewed in the two NHS surveys. It was found that the consumption of fruit and vegetables was the most prevalent in the two years evaluated, followed by smoking cessation. In the period, there was a statistically significant increase in positive health behaviors: physical activity during leisure time, fruit consumption, consumption of vegetables and smoking cessation (p<0.001). On the other hand, although less prevalent, alcohol abuse showed a significant increase (p<0.001), and the prevalence of current smoking did not change over the period (p=0.50) (Figure 1).

There was found to be a statistically significant difference in the distribution of health behaviors between the types of cities in which the elderly people lived (p<0.05). The differences occurred in each year and in between. Consumption of fruit and vegetables was similar: significantly higher in the capital than in the interior (p<0.05). However, over the period, fruit consumption increased in the capital and in the interior (p<0.001). Vegetable consumption increased in the MR and in the interior (p<0.001). Estimates of leisure-time physical activity in the two years were also higher in the capital than in the interior and increased over the period (p<0.001). The prevalence of current smoking differed from that observed for other behaviors: higher in the interior than in the capital and unchanged over the period (p<0.05). The prevalence of past smoking was higher in the interior than in the capital and MR, and the estimates increased in all three contexts over the period (p<0.001). Alcohol abuse was the least prevalent and there were no differences between the cities in 2013, and in 2019 the only difference was between the capital and the MR. However, consumption increased significantly in the capital and interior (p<0.001) (Table 2).

Figure 2 shows the prevalence of health behaviors by year, and is broken down by gender and age. The prevalence of current smoking did not differ statistically between ages in each year assessed, nor among men over the period (p>0.05). Among women, the prevalence was higher in younger elderly women (65 to 69) than in older women (≥80 years) in 2013 and than all other age groups in 2019 (p<0.05). The prevalence of past smoking was higher among men than women, and between the years the prevalence only increased in the two largest age groups (p<0.05). However, in women there was a significant increase for all ages during the period (p<0.05). Alcohol abuse was the least prevalent and in both years was higher among men than women of all ages. In men, the prevalence in both years was higher in younger elderly people and lower in older men (p<0.05) and there was no significant increase over the period (p>0.05). Among women, consumption increased significantly between 2013 and 2019 in the first two age groups (p<0.05). The prevalence of leisure-time physical activity did not differ between the sexes (p>0.05), but it increased in distinct ways over the period: for men it did not increase only in the oldest age group, and for women it only increased in the last two age groups (p<0.05). Finally, in both years, fruit consumption was always higher in women than in men at all ages. However, during the period there was only a significant increase among older men (p<0.05). Consumption of vegetables was only significantly higher in women than in men in the younger age groups and from 70 to 74 years (p<0.05), and there was only a significant increase in the period for men ≥80 years (p<0.05) (Figure 2).

Discussion

The results of this study showed important changes in the prevalence and distribution of positive health behaviors among elderly Brazilians between the 2013 and 2019 NHS surveys. There was an increase in adherence to positive health behaviors (consumption of fruit, vegetables, physical activity during leisure time and smoking cessation), but also negative behaviors (alcohol abuse) and stability in current smoking levels. These changes are in line with previous studies which have described an improvement over the years in estimates of positive health behaviors and a worsening of negative behaviors in the Brazilian population at large[6,9]. They also

Table 1. Socio-economic and demographic description of elderly (≥65 years) Brazilians interviewed in National Health Survey (NHS) 2013 (n=7,712) and 2019 (n=15,926), Brazil.

Variables	2013 (n=7,712)		2019 (n=15,926)		(2019 vs. 2013)
	%	CI95%	%	CI95%	p-value
Total	12.3	11.8-12.8	14.1	13.6-14.5	0.001
Sex					
Male	43.8	42.0-45.7	42.9	41.5-44.2	0.42
Female	56.2	54.3-58.0	57.1	55.8-58.5	
Age group (in years)					
65 to 69	36.1	34.3-37.9	36.6	35.4-37.8	0.89
70 to 74	26.8	25.2-28.5	26.2	25.1-27.4	
75 to 79	17.0	15.7-18.4	17.5	16.5-18.4	
≥80	20.0	18.5-21.5	19.7	18.6-20.7	
Color/race					
White	55.0	53.1-56.9	51.4	50.0-52.8	0.04
Brown	34.3	32.5-36.1	36.5	35.2-37.8	
Black	9.1	8.0-10.2	10.2	9.4-11.0	
Others	1.6	1.1-2.1	1.9	1.5-2.3	
Education (in levels)					
Up to incomplete primary or equivalent	75.6	73.8-77.5	68.2	66.9-69.5	0.001
Incomplete secondary or equivalent	7.4	6.4-8.4	8.0	7.3-8.8	
Incomplete higher education or equivalent	8.7	7.7-9.7	13.6	12.5-14.5	
Complete higher education	8.3	6.8-9.7	10.2	9.3-11.1	
Household income per capita					
Up to 1/2 MW	9.8	8.7-10.9	8.7	7.9-9.4	0.07
1/2 to 1 MW	35.0	33.0-36.9	33.6	32.3-34.9	
1 to 2 MW	32.2	30.3-34.1	31.8	30.6-33.0	
2 to 3 MW	9.8	8.7-10.9	10.4	9.6-11.2	
More than 3 MW	13.3	11.7-14.8	15.5	14.5-16.6	
Macroregion of residence					
North	5.2	4.7-5.6	6.1	5.7-6.4	0.80
Northeast	25.2	23.9-26.6	26.1	25.2-27.0	
Midwest	6.1	5.6-6.6	6.0	5.6-6.4	
Southeast	48.3	46.5-50.0	46.3	45.1-47.5	
South	15.2	14.1-16.3	15.5	14.8-16.3	
Type of city					
Capital	25.1	24.0-26.3	24.9	24.0-25.7	0.98
Metropolitan region, excluding capital	14.0	13.1-14.9	14.1	13.4-14.8	
Interior	60.9	59.4-62.4	61.1	60.0-62.1	
Area where household is located					
Urban	85.0	83.8-86.2	85.0	84.3-85.7	1.00
Rural	15.0	13.8-16.2	15.0	14.3-15.7	

Source: Brazil, NHS 2013 and 2019.

showed that there are still inequalities in the distribution of these behaviors according to the individual and contextual characteristics of elderly people, which indicate Brazil's difficulties in spreading and homogenizing healthier lifestyle dynamics throughout the country and over the years for the different groups of elderly people and risk factors. The time lag in the results between places and gender indicated that men and cities in the interior of the country have not yet

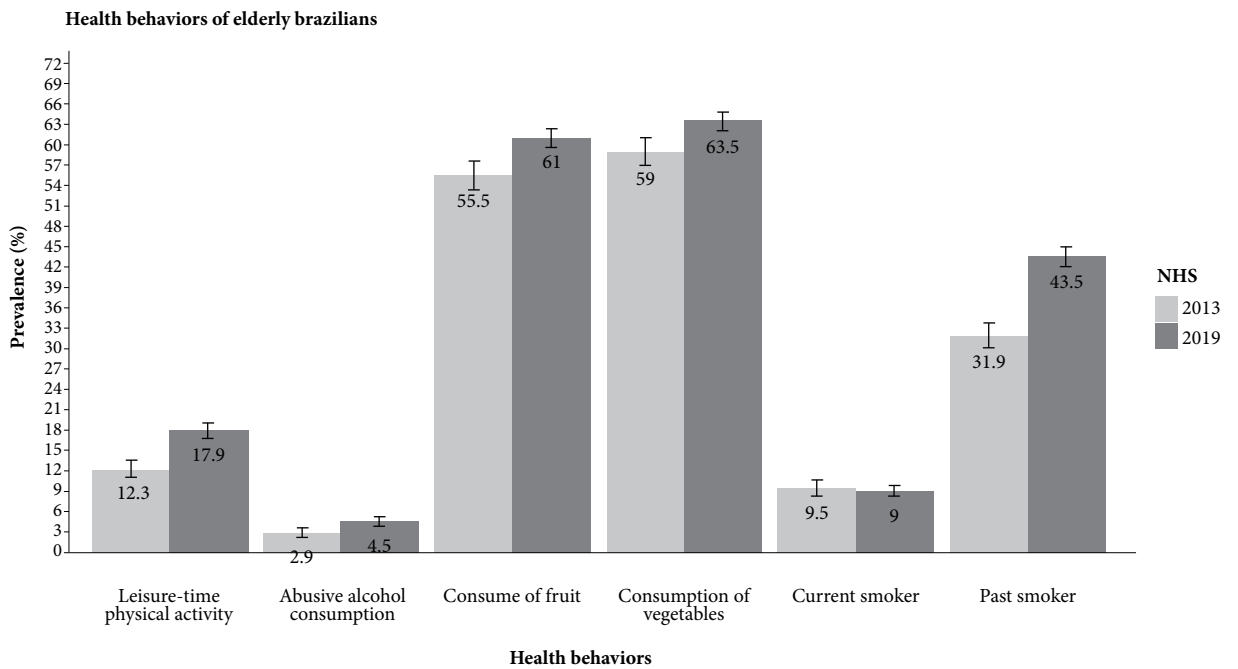

Figure 1. Prevalence of health behaviors of elderly (≥65 years) Brazilians interviewed in National Health Survey (NHS) 2013 (n=7,712) and 2019 (n=15,926), Brazil.

Note: All the behaviors evaluated showed a statistically significant difference (p-value<0.001), except Current smoker (p-value=0.50).

Source: Brazil, NHS 2013 and 2019.

Table 2. Prevalence of health behaviors depending on type of city within Federated Unit (UF) of elderly (≥65 years) Brazilians interviewed in National Health Survey (NHS) 2013 (n=7,712) and 2019 (n=15,926), Brazil.

Variables	2013 (n=7,712)						2019 (n=15,926)					
	Capital		Metropolitan region[1]		Interior		Capital		Metropolitan region[1]		Interior	
	%	CI95%	%	CI95%	%	CI95%	%	CI95%	%	CI95%	%	CI95%
Smoking												
Current smoker	6.6	5.5-7.7	8.7	6.5-11.0	10.9	9.2-12.6	7.1	6.1-8.1	9.2	7.4-11.0	9.8	8.7-10.9
Former smoker	29.0	26.6-31.3	27.4	23.7-31.1	34.1	31.4-36.8	40.4	38.3-42.4*	38.4	35.2-41.5*	46.0	44.1-47.9*
Alcohol												
Abusive consumption	3.1	2.2-3.9	4.3	2.6-6.1	2.5	1.7-3.3	5.7	4.9-6.6*	3.4	2.4-4.5	4.3	3.4-5.1*
Leisure-time physical exercise	16.2	14.5-18.0	9.1	6.7-11.4	11.5	9.8-13.3	22.5	20.8-24.1*	17.0	14.4-19.5*	16.2	14.7-17.7*
Diet												
Consumption of fruit	68.8	66.5-71.1	56.4	51.9-61.0	49.8	46.9-52.7	71.8	70.0-73.6	67.0	64.0-70.0*	55.3	53.4-57.1*
Consumption of vegetables	62.3	60.0-64.2	62.7	58.5-66.8	56.8	53.9-59.7	66.0	64.7-67.9*	64.6	61.5-67.6	62.2	60.4-64.0*

Notes: CI95%: Confidence Interval of 95%. [1] Excluding capital. *Pearson's chi-squared test p-value<0.001 for difference in relation to PNS 2013.

Source: Brazil, NHS 2013 and 2019.

reached the estimates already observed six years earlier in the capital and among women for some of the expected measures.

The estimates of positive health behaviors described in this study were lower than those observed in the Brazilian adult population also

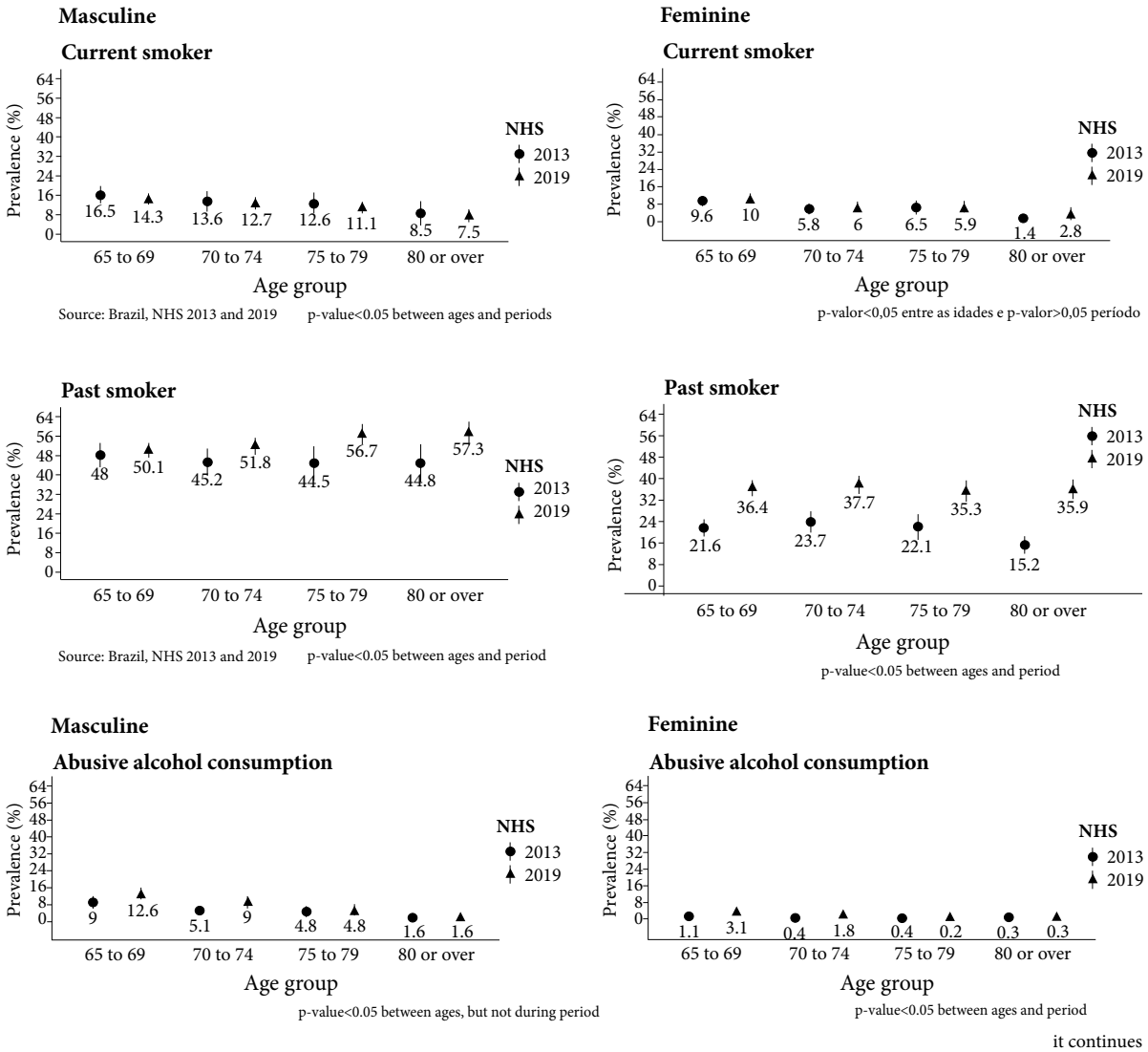

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Figure 2. Prevalence of health behaviors depending on sex and age of elderly (≥65 years) Brazilians interviewed in National Health Survey (NHS) 2013 (n=7,712) and 2019 (n=15,926), Brazil.

evaluated in the same NHS surveys[9,14], but health behaviors varied in the same direction. In relation to elderly people in other countries[8,10,20-22], the estimates were always significantly lower, even when differences of gender and age group were taken into account. A number of reasons may explain these differences. Socio-economic, racial and geographical inequalities in Brazil are very noticeable in comparison with other countries and define elderly cohorts with markedly more vulnerable life and health trajectories[8,11-13]. This reality leads to a less active and healthy ageing process, which is reflected in more urgent social needs and lower healthy life expectancy than that recommended[4,9]. Guidance from health professionals on healthy habits is not equally distributed among the elderly population, and as a result, the poorest tend to adopt less healthy behaviors[16]. Another reason is that the success of Brazilian public policy to combat smoking has not been replicated as effectively in other policies that have tackled other negative health behaviors. It is possible that encouraging the consumption of fruit and vegetables, as well as physical activity, and reducing alcohol abuse, depend more on actions relating to access to income, the production

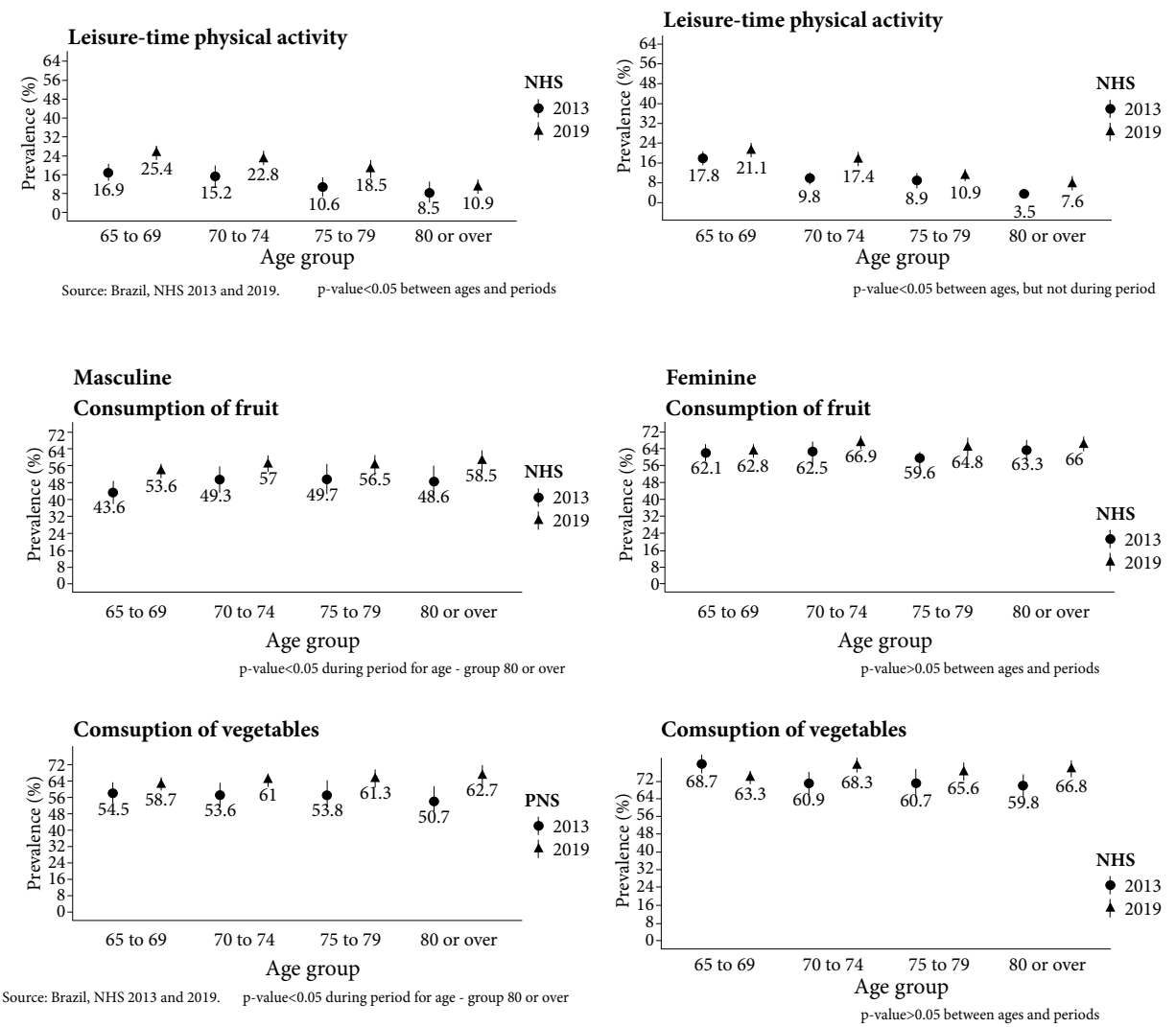

Figure 2. Prevalence of health behaviors depending on sex and age of elderly (≥65 years) Brazilians interviewed in National Health Survey (NHS) 2013 (n=7,712) and 2019 (n=15,926), Brazil.

Source: Brazil, NHS 2013 and 2019.

and marketing of food and drink, price controls, taxation, subsidies and city infrastructure than on actions to raise awareness and publicity about their benefits or associated risks[2,5,9].

Geographical variations in positive health behaviors and their associated risks are well described in Brazil, but most studies focus their attention on the adult population of the country's capital cities[23], which tends to ignore the reality of the vast majority of Brazilian cities, which are of small and medium size, whether or not forming part of metropolitan regions[24]. Our study presented results that reduce this ignorance and points out that temporal changes in health measures have occurred favorably in all types of cities in Brazil, but positive behaviors (consumption of fruit and vegetables and physical activity) were more frequent in the capitals and negative behaviors (smoking) in the interior, with the exception of alcohol abuse, which predominated in both contexts.

Analyses of the quality of ageing and life expectancy in different parts of Brazil show a gradient in positive health behaviors depending on

the type of city[3,8,25-27]. Although most of these findings are from large cities, they are similar to those observed in our research and describe an unequal scenario in which the majority of Brazil's elderly population have not yet adhered to satisfactory levels of health. A number of reasons can be attributed to this reality. Depending on the type of city, the elderly present greater or lesser socio-economic differences, in the availability of food and drink, and in access to health, urban infrastructure and leisure facilities. Elderly people in cities outside the major urban centers may be the most impacted by these differences and those with less access to resources that could increase adherence to healthy behaviors[7]. Awareness campaigns and health promotion policies may be less implemented in cities in the interior of the country, which may lead to their residents receiving less socio-economic, community and cultural stimuli for a healthy life. One of the consequences of this reality is the inequalities in healthy life expectancy between states[3] and in mortality indicators[24] between the different city typologies in Brazil.

Health inequalities among the elderly based on the variables of sex and age were the first and most consolidated to be described and interpreted in the literature on ageing in Brazil. However, at the same time, the temporal changes in the estimates of a range of health behaviors in the country by these variables are still the least evaluated among the elderly. This study pointed out that age and gender play a substantial role in the adherence and maintenance of health behaviors among the elderly, as it was found that the distribution of health behaviors was not the same between the age groups of men and women. Although women have a more satisfactory dietary pattern, current smoking and alcohol use than men, only women showed a statistically significant increase in the prevalence of current smoking and alcohol abuse, especially among younger elderly women. This result may indicate that the younger cohorts of elderly women seem to maintain negative health behaviors from the adult stage of life, as they reach the elderly stage physically more independent and with fewer morbidities than previous cohorts. Levels of physical activity at all ages actually increased among women, but not homogeneously. Taken together, these findings are similar to studies that describe women's health levels as better than men's due to their greater exposure to health programs and services[3,8,10,25]. However, they are also similar to studies that show an increase in negative health behaviors: smoking, alcohol abuse and a slow reduction in physical inactivity[3,6,10,28]. This high level of physical inactivity and the slight reduction observed in this study (in 2013: 87.7%; 95%CI: 86.4-89.0; and in 2019: 82.1%; 95%CI: 81.1-83.2) reveal that active ageing in Brazil is not a routine in the lives of the vast majority of Brazilians. This reality increases the need for initiatives so that the elderly can have greater chances and resources to adhere to and maintain regular physical activity and its protective effects associated with physical and emotional health.

These results show that it is necessary to consider the individual and contextual characteristics of the elderly when implementing prevention and health programs. These programs may recognize that elderly people with different realities may generally have different access to resources, and therefore specific strategies for tackling the health risk factors need to be implemented. Monitoring the distribution of behaviors related to the risk factors analyzed in this research contributes to understanding the dynamics of these factors and their variation over time, allowing for the evaluation of the effectiveness of policies, and highlights their challenges among the specific groups of elderly people evaluated.

Our results are affected by certain limitations. The NHS is a cross-sectional survey which makes it difficult to indicate health measures for the same individuals over time. The NHS does not consider the institutionalized population and the survivorship bias may have affected the results by indicating a healthier scenario between the two surveys. Health behaviors have been self-reported and may be subject to memory bias. The comparison of prevalence between the surveys may be influenced by differences in the questions posed between them: in 2013 two questions were asked about vegetables (raw and cooked) and in 2019 only one was asked, and the level of leisure-time physical activity was assessed considering the previous 3 months in 2013 and the previous 12 months in 2019. The size of the elderly populations in the two surveys was different and larger in 2019. This size is associated with the characteristics of the sampling plan and population in the period. These differences may have increased the precision of the estimates in 2019 and reflected statistical differences compared to 2013. Analysis of the results must take into account the political and socio-economic changes that took place in Brazil between the two surveys, which may have shaped the findings described. However, the NHS has a national scope with a representative sample

of the Brazilian elderly population, which, due to its regularity over time, makes it possible to identify the situation of health behaviors, their evolution and inequalities in the country. It represents an opportunity to compare the distribution of positive health behaviors in the population and verify the quality of ageing in the country, indicating the population groups and localities that most need attention in order to achieve more adequate levels of health promotion.

Final considerations

There was an increase in the prevalence of positive health behaviors (consumption of fruit and vegetables, physical activity during leisure time and smoking cessation) between the years evaluated, but also negative behaviors (alcohol abuse) and the level of current smoking remained stable in Brazil. However, the continued inequalities in the distribution of health behaviors according to the individual and contextual characteristics of the elderly point to the challenges the country still faces in guaranteeing greater and more homogeneous levels of health for all the country's elderly citizens.

The growth of the ageing population and the pattern of health behaviors described in this research indicate the importance of specific health promotion programs. Both the gains in health and the health problems observed in this analysis may be further impacted in the future by the recent socio-economic and health crises and socio-cultural changes underway in Brazil. These processes could exacerbate inequalities that will amplify the health problems and needs of elderly Brazilians.

Therefore, comprehensive and regular socio-political actions and interventions in the infrastructure of cities need to be implemented in order to promote and maintain positive health behaviors in the country at levels closer to those observed in other middle- and high-income countries, which can contribute to promoting health and improving the quality of life and well-being of different segments of the elderly population with characteristics similar to those described in this analysis.

Collaborations

The authors of this work declare their responsibility for having participated equally in the conception of the project, literature review, data analysis and interpretation, writing, critical review of its content and approval of the final version for publication.

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