

# Lifestyles in Brazilian capitals according to the National Health Survey and the Surveillance System for Protective and Risk Factors for Chronic Diseases by Telephone Survey (Vigitel), 2013

*Estilos de vida nas capitais brasileiras segundo a Pesquisa Nacional de Saúde e o Sistema de Vigilância de Fatores de Risco e Proteção para Doenças Crônicas Não Transmissíveis por Inquérito Telefônico (Vigitel), 2013*

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**ABSTRACT:** *Objective:* To describe risk and protective factors for chronic diseases, in Brazilian capitals and the Federal District, collected by the National Health Survey (PNS) and by the Surveillance System for Protective and Risk Factors for Chronic Diseases by Telephone Survey (Vigitel) in 2013. *Methods:* Data analysis of the studies conducted by the PNS and Vigitel in 2013 was performed. Indicators analyzed were: smoking, alcohol consumption, diet, and physical activity, according to sex, with a 95% confidence interval. *Results:* The prevalences found were: current cigarette smokers: PNS, 12.5% and Vigitel, 11.3%; abuse of alcoholic beverages: PNS, 14.9% and Vigitel, 16.4%; recommended intake of fruits and vegetables: PNS, 41.8% and Vigitel, 23.6%; and physical activity in leisure time: PNS, 26.6% and Vigitel, 35.8%. *Conclusion:* In the majority of indicators, the results were similar, especially when the questions and response options were equal. Surveys are useful for the monitoring of risk and protective factors of noncommunicable diseases and can support health promotion programs.

**Keywords:** Health surveys. Chronic disease. Life style. Risk factors. Smoking. Epidemiological surveillance.

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**RESUMO:** *Objetivo:* Descrever os principais resultados dos fatores de risco e proteção de doenças crônicas não transmissíveis (DCNT), nas capitais brasileiras e no Distrito Federal, coletados pela Pesquisa Nacional de Saúde (PNS) e pelo Sistema de Vigilância de Fatores de Risco e Proteção para Doenças Crônicas Não Transmissíveis por Inquérito Telefônico (Vigitel) no ano de 2013. *Métodos:* Análise de dados advindos da PNS e do Vigitel, pesquisas realizadas no ano de 2013. Foram analisados indicadores sobre tabagismo, consumo de álcool, alimentação e atividade física, segundo sexo, com intervalo de confiança de 95% (IC95%). *Resultados:* As prevalências encontradas foram: fumantes atuais de cigarro — PNS 12,5% e Vigitel 11,3%; consumo abusivo de bebida alcoólica — PNS 14,9% e Vigitel 16,4%; consumo recomendado de frutas e hortaliças — PNS 41,8% e Vigitel 23,6%; prática de atividade física no tempo livre — PNS 26,6% e Vigitel 33,8%. *Conclusão:* Os resultados dos indicadores foram semelhantes, em especial quando as perguntas e opções de resposta também eram. As pesquisas são úteis para o monitoramento dos fatores de risco e proteção das DCNT, podendo apoiar programas de promoção da saúde.

**Palavras-chave:** Inquéritos epidemiológicos. Doença crônica. Estilo de vida. Tabagismo. Fatores de risco. Vigilância epidemiológica.

## INTRODUCTION

Population-based health surveys have been widely used as instruments to produce knowledge for public health, guiding the elaboration and evaluation of the policies in the sector<sup>1-3</sup>. These surveys generate information that enable the construction of indicators about the profile and social determinants of health and the morbidity and the lifestyle of the population studied, indicating the distribution of exposures and risk conditions and protection for specific diseases or injuries<sup>4,5</sup>.

The World Health Organization (WHO) recommends that surveillance of chronic noncommunicable diseases (NCDs) and their risk and protective factors is accomplished through population-based surveys whose level of complexity can be increased with the inclusion of anthropometric measurements and laboratory tests, according to the specific nature of NCDs: long asymptomatic course of disease, lack of mandatory notification of cases, high cost for monitoring of population cohorts, and the possibility of action on risk factors<sup>6-9</sup>.

In Brazil, aiming to build a surveillance system for NCDs, the Secretary of Health Surveillance (SVS) of the Ministry of Health (MS) has implemented a monitoring system that includes household surveys for every 5 years. In 2003, a survey was conducted on risk factors for NCDs in 17 capitals, as a result of a partnership between the National Cancer Institute (INCA) and the SVS<sup>2</sup>. In 2006, the Surveillance System for Protective and Risk Factors for Chronic Diseases by Telephone Survey — Vigitel — was developed, aiming to annually monitor the frequency and distribution of risk and protective factors for NCDs in adults residing in Brazilian capitals and in the Federal District<sup>2,10</sup>. In 2008, a specific module on physical activity, smoking, and morbidity by NCDs was included in

the questionnaire from the National Household Sample Survey (PNAD)<sup>11,12</sup>. The 5-year monitoring was continued in 2013, further delving in the themes, through the National Health Survey (PNS)<sup>4</sup>.

PNS brought improvements through its approach, with face-to-face interviews in household environments. However, this type of study cannot be performed continuously owing to its high cost and logistical complexity; so, the annual monitoring of the main indicators used in NCD surveillance has been carried out by Vigitel.

This study aimed to describe the main results of the risk and protective factors for NCDs in Brazilian capitals and in the Federal District, collected by PNS and Vigitel in 2013.

## METHODS

We conducted an analysis of the data on risk and protective factors for NCDs from PNS and Vigitel, 2013. PNS is a household survey whose sampling process was performed by cluster sampling, carried out in three stages: census tracts (primary units), households (secondary units), and one 18-year resident or older (tertiary unit). The minimum sample size was 1,800 households per federal unit (UF), with a total of 64,348 households, where interviews were conducted.

The interviews were conducted using handheld computers—personal digital assistants (PDAs). Estimates provided by PNS were weighted considering the weight of the household, adjustment for nonresponse by sex and total population by sex and age, and counting the number per household. More details on the process of sampling and weighting are available in the publication on the results of the PNS<sup>13</sup>.

Vigitel is a survey conducted with the adult population ( $\geq 18$  years) living in Brazilian state capitals and in the Federal District. The sample size of this survey is probabilistic, from the records of landline telephones of the studied locations. The sample consists of 5,000 telephone lines divided into 200 subsamples for each city, in order to identify eligible lines (active households). Then, the residents to be interviewed were drawn<sup>10</sup>.

Estimates of Vigitel were weighted through the raking method of poststratification<sup>14,15</sup>, using the estimates of age, sex, and education of the population projected for the year of the survey. The aim of Vigitel's weighting is to equalize the distribution of the population interviewed with the distribution of the population estimated by the Census. Details on sampling and weighting are given in other publications<sup>14,15</sup>.

The construction of the module on lifestyles of the questionnaire of PNS sought to make the data collected in Vigitel compatible, to enable monitoring of useful health indicators in the surveillance of NCDs. In this comparative study of PNS with Vigitel, some indicators related to lifestyle (diet, alcohol consumption, smoking, and physical activity) were considered for the capitals and the Federal District (Chart 1). The intention was to point out the similarities and differences between the indicators investigated in both the surveys.

Chart 1. Comparison of the questionnaires and indicators of the National Health Survey and the Surveillance System for Protective and Risk Factors for Chronic Diseases by Telephone Survey, 2013.

Indicators PNS (2013)	Questions		
	PNS (2013)	Vigitel (2013)	Similarities and differences found between PNS e Vigitel
<b>Smoking</b>			
Current cigarette smokers	Currently, do you smoke any tobacco product? On average, how many of the following items do you currently smoke per day or per week? ... a) factory-made cigarettes?; b) straw or hand-rolled cigarettes?; c) clove cigarettes or <i>kreteks</i> ?	Are you a smoker?	Comparable questions, with minor differences. PNS is more detailed, listing the types of tobacco products.
Passive smokers at home	Currently, do you smoke any tobacco product? How often does someone smoke inside your household?	Are you a smoker? Do any of the people who live with you have the habit of smoking inside your household?	Comparable questions, with minor differences.
Passive smokers in the workplace	Currently, do you smoke any tobacco product? Thinking about all your jobs over the past 30 days, did someone smoke in a closed environment where you work?	Are you a smoker? Do any work colleague often smoke in the same room where you work?	Comparable questions. PNS specifies smoking in a closed environment.
Former smokers	Currently, do you smoke any tobacco products? And in the past, did you smoke any tobacco products?	Are you a smoker? Have you ever been a smoker?	Comparable questions, with minor differences.
<b>Alcohol consumption</b>			
Alcohol abuse	Over the past 30 days, have you consumed five/four (for men/women, respectively) or more alcoholic drinks on one occasion?	Over the past 30 days, have you consumed five/four (for men/women, respectively) or more alcoholic drinks on one occasion?	Identical questions. The PNS applied a filter to question relating to alcoholic beverage consumption. Thus, the respondents who referred drinking less than once per month were excluded. Vigitel questions all who claim they drink, regardless of the amount.

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Chart 1. Continuation.

Indicators PNS (2013)	Questions		
	PNS (2013)	Vigitel (2013)	Similarities and differences found between PNS e Vigitel
Food consumption			
Recommended consumption of fruits and vegetables (FV)	<p>In how many days of the week do you usually eat green salad or tomato salad, or any other raw vegetables?</p> <p>In general, how many times a day do you eat this kind of salad?</p> <p>In how many days of the week do you usually eat cooked vegetables, such as kale, carrot, chayote, eggplant, zucchini?</p> <p>In general, how many times a day do you eat cooked vegetables?</p> <p>In general, how many times a day do you eat fruit?</p> <p>In general, how many glasses of natural fruit juice do you drink a day?</p>	<p>In how many days of the week do you usually eat green salad or tomato salad or any other raw vegetables?</p> <p>On an average day, do you eat this type of salad ... at lunch, dinner or both?</p> <p>In how many days of the week do you usually eat cooked vegetables with your food or soup, for example, kale, carrot, chayote, eggplant, zucchini (not counting potatoes, cassava or yam)?</p> <p>On an average day, do you eat cooked vegetable ... at lunch, dinner or both?</p> <p>On an average day, how many cups of natural fruit juice do you drink?</p> <p>On an average day, how many times do you eat fruit?</p>	<p>The questions are similar. In general, PNS questions eating behavior on a typical day, and Vigitel questions the behavior during most days of the week. Different concepts have been applied:</p> <p>Vigitel measures the consumption of five servings of FV five or more days a week.</p> <p>The PNS measures five servings of FV on a typical day, assuming the same regularity for FV consumption on other days of the week.</p>
Regular consumption of beans	In how many days of the week do you usually eat beans?	In how many days of the week do you usually eat beans?	Identical questions.
Fatty meats	<p>When you eat red meat, do you usually ... b) eat it with fat?</p> <p>When you eat chicken/poultry, do you usually ... b) eat it with the skin?</p>	<p>When you eat red meat, do you usually ... b) eat it with fat?</p> <p>When you eat chicken/poultry, do you usually ... b) eat it with the skin?</p>	Identical questions.

Continue...

Chart 1. Continuation.

Indicators PNS (2013)	Questions		
	PNS (2013)	Vigitel (2013)	Similarities and differences found between PNS e Vigitel
Regular consumption of soft drinks or artificial juice	In how many days of the week do you consume soft drinks (or artificial juice)?	In how many days of the week do you consume soft drinks or artificial juice?	Identical questions.
Physical activity*			
Practice of the recommended level of physical activity during free time	<p>In the last three months, did you practice some form of physical exercise or sport?</p> <p>In how many days per week do you usually practice a physical exercise or sport?</p> <p>What physical exercise or sport do you practice more often?</p> <p>In general, in the day you practice a physical exercise or sport, how long is this activity?</p>	<p>In the last three months, did you practice some form of physical exercise or sport?</p> <p>What is the main type of physical exercise or sport that you practiced?</p> <p>Do you practice physical exercise at least once a week?</p> <p>In how many days per week do you usually practice a physical exercise or sport?</p> <p>On the day that you practice an exercise or sport, how long is this activity?</p>	Similar questions.
Watching TV	On average, how many hours per day do you spend watching television?	On average, how many hours per day do you spend watching television?	Same question, difference in response options.

PNS: National Health Survey; Vigitel: Surveillance System for Protective and Risk Factors for Chronic Diseases by Telephone Survey.

The indicators were calculated with the total number of adults interviewed as the denominator. All indicators were presented by sex, with 95% confidence intervals (95%CI). Data were analyzed using Stata software, version 11.0, using the survey module, which incorporates the effects of complex sampling.

Vigitel was approved by the National Research Ethics Commission (CONEP) of the MS, under protocol no. 749/2006 and record no. 13,081, updated by protocol no. 355.590, 2013. PNS was also approved by CONEP, under protocol no. 328.159, June 26, 2013.

## RESULTS

A simple random sample of 81,167 households was drawn from PNS, and information was collected from 64,348 households. Adults drawn responded to the individual questionnaire, including the module on lifestyle, with a nonresponse rate of 8.1%. In Vigitel 2013, the number of interviews conducted was on 52,929 individuals, and the rate of refusal was of 3.9%. In both the surveys, the highest proportion of respondents was females (52.9% in the PNS and 61.7% in Vigitel).

The prevalence of current cigarette smokers was 12.5% (95%CI 11.9 – 13.2) in the PNS and 11.3% (95%CI 10.6 – 11.9) in Vigitel. The prevalence of former smokers found in the PNS was of 16.5%, while in Vigitel was 22.0% (Table 1). The frequency of passive smokers at home and former smokers was higher in Vigitel, for the total sample and for male subjects (Tables 1 and 2). The prevalence of current smokers and passive smoking in the workplace among women was higher in the PNS (Table 3). Men showed a higher prevalence of current smoking (15.5% in the PNS and 14.4% in Vigitel), passive smoking at work (12.0% in the PNS and 14.1% in Vigitel) and former smokers (20.3% in the PNS and 25.6% in Vigitel) than women (Tables 2 and 3).

The abuse of alcohol was reported by 14.9% (95%CI 14.215.6) and 16.4% (95%CI 15.717.0) of the respondents in the PNS and in Vigitel, respectively (Table 1). Alcohol consumption, in both the surveys, was greater in men (23.2% in the PNS and 24.2% in Vigitel) than in women (8.2% in the PNS and 9.7% in Vigitel) (Tables 2 and 3).

Consumption of high-fat meats was reported by 29.8% (95%CI 28.8 – 30.8) and 31.0% (95%CI 30.1–31.8) of respondents in the PNS and in Vigitel, respectively (Table 1), with no differences in the two studies for male (Table 2) and female subjects (Table 3). Results similarity between the two surveys were checked for regular consumption of soft drinks or artificial juice (24.0%, 95%CI 23.224.9, in the PNS and 23.3%, 95%CI 22.524 1, in Vigitel). The recommended consumption of fruits and vegetables was reported by 41.8% of the residents interviewed by PNS (95%CI 40.6 – 42.9) and approximately by 23.6% of those surveyed by the Vigitel (95%CI 22.9 – 24.3), especially for women, who showed higher prevalence than men in both the surveys (44.3% in the PNS and 27.3% in Vigitel for women and 38.3% in the PNS and 19.3% in Vigitel for men) (Tables 1 to 3).

The regular consumption of beans was the eating habit with higher prevalence among respondents: 64.9% (95%CI 63.9 – 65.9) in the PNS and 66.9% (95%CI 66.1 – 67.7) in Vigitel. The surveys also showed similar results between the sexes, with beans being more consumed among men (about 70%) than among women (around 60%) (Tables 1 to 3).

Table 1. Comparison of the prevalences of risk and protective factors for chronic diseases in the adult population of Brazilian state capitals and the Federal District, according to the National Health Survey and the Surveillance System for Protective and Risk Factors for Chronic Diseases by Telephone Survey, 2013.

Indicators	Total			
	PNS (2013)		Vigitel (2013)	
	Prevalence	95%CI	Prevalence	95%CI
<b>Smoking</b>				
Current cigarette smokers	12.5	11.9 – 13.2	11.3	10.6 – 11.9*
Passive smokers at home	8.7	8.0 – 9.3	10.2	9.6 – 10.8
Passive smokers in the workplace	10.4	9.6 – 11.2	9.8	9.2 – 10.4*
Former smokers	16.5	15.7 – 17.2	22.0	21.3 – 22.7
<b>Alcohol consumption</b>				
Alcohol abuse	14.9	14.2 – 15.6	16.4	15.7 – 17.0
<b>Food consumption</b>				
Recommended consumption of fruits and vegetables	41.8	40.6 – 42.9	23.6	22.9 – 24.3
Regular consumption of beans	64.9	63.9 – 65.9	66.9	66.1 – 67.7
Fatty meats	29.8	28.8 – 30.8	31.0	30.1 – 31.8*
Regular consumption of soft drinks or artificial juice	24.0	23.2 – 24.9	23.3	22.5 – 24.1*
<b>Physical activity</b>				
Practice of the recommended level of physical activity during free time	26.6	25.7 – 27.6	33.8	33.0 – 34.6
Watching TV for more than three hours a day	33.0	32.0 – 33.9	28.6	27.8 – 29.4

\*In the comparison of the 95% confidence interval between Vigitel and PNS, there is an overlap. PNS: National Health Survey; Vigitel: Surveillance System for Protective and Risk Factors for Chronic Diseases by Telephone Survey.

The practice of the recommended level of physical activity during free time was reported by 26.6% (95%CI 25.7 – 27.6) and 33.8% (95%CI 33.0 – 34.6) of the respondents in the PNS and in Vigitel, respectively. Comparing the results by sex confirms that men are more active in their free time than women (Tables 1 to 3).

Table 2. Comparison of the prevalence of risk and protective factors for chronic diseases in the adult male population of Brazilian state capitals and the Federal District, according to the National Health Survey and the Surveillance System for Protective and Risk Factors for Chronic Diseases by Telephone Survey, 2013.

Indicators	Males			
	PNS (2013)		Vigitel (2013)	
	Prevalence	95%CI	Prevalence	95% CI
Smoking				
Current cigarette smokers	15.5	14.4 – 16.5	14.4	13.3 – 15.5*
Passive smokers at home	7.8	6.9 – 8.6	9.6	8.7 – 10.5
Passive smokers in the workplace	12.0	10.8 – 13.3	14.1	13.1 – 15.2*
Former smokers	20.3	19.1 – 21.5	25.6	24.4 – 26.7
Alcohol consumption				
Alcohol abuse	23.2	22.0 – 24.4	24.2	23.0 – 25.4*
Food consumption				
Recommended consumption of fruits and vegetables	38.6	37.1 – 40.2	19.3	18.2 – 20.4
Regular consumption of beans	70.7	69.3 – 72.1	73.0	71.8 – 74.2
Fatty meats	38.8	37.3 – 40.3	41.2	39.9 – 42.6*
Regular consumption of soft drinks or artificial juice	27.1	25.8 – 28.4	26.7	25.4 – 28.0*
Physical activity				
Practice of the recommended level of physical activity during free time	33.5	32.0 – 34.9	41.2	39.9 – 42.5
Watching TV for more than three hours a day	30.2	28.8 – 31.7	28.1	26.8 – 29.3*

\*In the comparison of the 95% confidence interval between Vigitel and PNS, there is an overlap. PNS: National Health Survey; Vigitel: Surveillance System for Protective and Risk Factors for Chronic Diseases by Telephone Survey.

The prevalence of adults who usually watch television for three or more hours was slightly higher in the PNS (33.0%; 95%CI 32.0 – 33.9) than in Vigitel (28.6%; 95%CI 27.8 – 29.4). This difference was also showed for women, with similar results for men (Tables 1 to 3).

Table 3. Comparison of the prevalence of risk and protective factors for chronic diseases in the adult female population of Brazilian state capitals and the Federal District, according to the National Health Survey and the Surveillance System for Protective and Risk Factors for Chronic Diseases by Telephone Survey, 2013.

Indicadores	Females			
	PNS (2013)		Vigitel (2013)	
	Prevalência	IC95%	Prevalência	IC95%
Smoking				
Current cigarette smokers	10.1	9.4 – 10.9	8.6	7.9 – 9.3
Passive smokers at home	9.3	8.5 – 10.2	10.7	10 – 11.5*
Passive smokers in the workplace	8.9	7.9 – 9.9	6.1	5.5 – 6.7
Former smokers	13.3	12.5 – 14.2	18.9	18.1 – 19.8
Alcohol consumption				
Alcohol abuse	8.2	7.5 – 8.8	9.7	9.0 – 10.4
Food consumption				
Recommended consumption of fruits and vegetables	44.3	42.9 – 45.7	27.3	26.3 – 28.2
Regular consumption of beans	60.1	58.9 – 61.4	61.7	60.6 – 62.7*
Fatty meats	22.4	21.3 – 23.5	22.2	21.2 – 23.1*
Regular consumption of soft drinks or artificial juice	21.5	20.5 – 22.6	20.4	19.4 – 21.3*
Physical activity				
Practice of the recommended level of physical activity during free time	21.0	20.0 – 22.1	27.4	26.5 – 28.3
Watching TV for more than three hours a day	35.2	34.1 – 36.4	29.0	28.0 – 30.0

\*In the comparison of the 95% confidence interval between Vigitel and PNS, there is an overlap.  
PNS: National Health Survey; Vigitel: Surveillance System for Protective and Risk Factors for Chronic Diseases by Telephone Survey.

## DISCUSSION

The study presents the frequencies of indicators relating to lifestyle (smoking, alcohol abuse, food intake, and physical activity) for Brazilian capitals, according to the PNS and Vigitel, both held in the same year (2013). In most indicators, the results were similar, especially when the questions and answer choices were the same, such as in the indicators for the consumption of fatty meats and soft drinks ingested by about a third and a quarter of the population, respectively. Bean consumption was reported by about 65% of the respondents, with little difference in frequencies between the two surveys. The consumption of vegetables showed greater difference, because the two surveys adopted different concepts. Smoking indicators were similar: current cigarette smokers and passive smokers at home. Physical activity indicators showed slight differences that can be explained by the introduction of different questions in the PNS. The practice of physical activity during free time was found to be higher in Vigitel, while the PNS showed higher frequency of time watching TV.

Population-based surveys show great advances for health information, and differences found in the comparison between the different studies may be explained by methodological differences<sup>2,3</sup>, such as sampling and data collection strategy, which can interfere with the proper understanding of the issues<sup>2,3,16</sup>. In fact, when comparing the PNS with Vigitel, an important feature to consider is the sampling, as the PNS conducted home interviews with face-to-face questions, while Vigitel conducted telephone interviews. In general, household surveys are quite comprehensive, presenting results of great importance to the knowledge of the epidemiological reality, but their complexity and difficulties in logistic, planning, and implementation have a high cost<sup>2,3,6</sup>.

The PNS consists of a more comprehensive study, with several modules, and the application time can vary from 50 minutes to about 3 hours, containing detailed modules and with national representation. The selected sample was suitable to represent the overall adult population (regardless of landline ownership) in the country, in the large regions, Federative Units, Brazilian capitals, and the Federal District<sup>4,13</sup>. The sample of Vigitel represents the adult population of the Brazilian capitals and the Federal District who lives in households with landline telephones. Although poststratification weights are used to minimize the differences between the population with and without landlines, the results of Vigitel allow inferences only for the adult population of the capitals of Brazil and the Federal District. On the other hand, Vigitel shows main features such as agility, low cost, and the speed of dissemination of results, with great advantage for the continuous and annual monitoring of the indicators<sup>2,10,15</sup>.

Comparative studies of surveys also point to the fact that various options should be considered for finding the differences, however small, such as the fact that questions are not the same, response options are different, and the order of questions is changed<sup>17</sup>. Seeking greater comparability of data, despite the methodological differences, the questionnaire of the PNS for the lifestyle module generally followed a similar model to Vigitel, although variations were introduced in several questions.

Thus, situations pointed in different comparative studies<sup>16,17</sup> were, in part, identified in the comparison between PNS and Vigitel owing to small differences in questions and response options, changed order of the questions, differences in jumps, filters, changes in the calculation method and concepts of the indicators, and the different methodological strategies. The presence of the researcher in the household can introduce differences, whether in better understanding of the question and response options, in better communication, leading to responses that are closer from reality or to embarrassment on certain topics. Vigitel, on the other hand, being carried out by phone, may be better suited for more sensitive topics such as use of alcohol, being more impersonal and not face to face.

Furthermore, Vigitel performs interviews over the course of 1 year, to avoid seasonal variations in response options. The collection of data from the PNS was carried out through home interviews from August 2013 to February 2014. For example, physical activity levels are subject to change because of the weather and the season<sup>18</sup>.

When comparing the results of the PNS and Vigitel regarding consumption of fruit and vegetables, the questions were similar. However, different concepts were applied: Vigitel measured the consumption of five servings of fruits and vegetables in five or more days a week<sup>10</sup> or most days of the week, while the PNS considered the consumption of five servings of fruits and vegetables in an ordinary day, assuming the same regularity in the consumption of fruits and vegetables on other days of the week<sup>13</sup>. Thus, differences in the concept of this indicator can explain lower frequencies in Vigitel, for considering two conditions: five servings in five days or more a week.

Similarly, the filter applied to the PNS related to alcohol consumption, excluding respondents who drink less than once a month, can explain somewhat lower frequencies in the PNS<sup>13</sup>. In Vigitel, the indicator includes in the calculation all individuals who refer drinking, regardless of the amount<sup>10</sup>.

As a similarity, the two surveys found that the abuse of alcohol was higher among men, which is in accordance with the literature<sup>19</sup>. Other factors that can interfere are related to a greater ease in taking some risk behaviors by phone rather than in direct response to the interviewer<sup>16</sup>. Alcohol abuse can fit in this situation.

In most indicators studied, similar estimates were identified. This result is consistent with other studies that compare prevalences of household (National Health Survey Interview – NHIS) and telephone surveys (Behavioral Risk Factor Surveillance System – BRFSS).<sup>20</sup> Similarly, a study of behavioral risk factors and preventive practices carried out in Madrid, Spain (1999/2000), showed similarity between the results obtained by a telephone interview and a face-to-face interview<sup>17</sup>. Another study, in Belo Horizonte in 2010, pointed out similarities in the results of Vigitel and the household survey for most indicators surveyed<sup>21</sup>.

Among the limitations, the results may also reflect differences in schooling and income, because the ownership of a landline in the household is a social indicator, usually associated

with higher education, which may reduce the participation of low-income populations in the telephone survey, although weighting factors in Vigitel seek to minimize the differences between the population with and without a landline telephone. The main limitation of Vigitel is the sample restriction on households with landlines in the state capitals, which can cause biases in the estimates in state capital whose landline coverage rate is lower than 70%<sup>22</sup>.

Both studies are in accordance with the results of international<sup>23</sup> and national<sup>24,25</sup> literature in indicating a higher prevalence of smoking among men, which was confirmed in the data from both the PNS and Vigitel. Higher prevalence of smoking in men is described since the start of the tobacco epidemic, because this habit has always been associated with the idea of strength and power. The Special Survey of Tobacco Use (PETab) in 2008 showed the prevalence of exposure to passive smoking in nonsmokers in Brazil: 12.5% in the household environment and 24.4% in the workplace<sup>25</sup>. Therefore, the PNS pointed a decline in tobacco prevalence between 2008 and 2013<sup>13,25</sup>. Similarly, Vigitel has been pointing to this decline in every year surveyed<sup>10,26</sup>.

The results of both the surveys showed prevalence rates with minor differences in terms of physical activity, but which point to results in the same direction, that is, one in four adults meets the physical activity recommendations in their free time and approximately one-third of the population spends more than 3 hours a day watching television. Both surveys indicated that men are more active during free time than women. The scientific literature has suggested that sedentary behavior (time sitting) is associated with increased risk of cardiovascular events<sup>27</sup> and higher mortality rates from all causes<sup>28</sup>.

## CONCLUSION

Indicators with the same or very similar question, such as consumption of soft drinks and fatty meats, revealed the same results, showing that the same question and the same response choices are essential in comparing the estimates<sup>17</sup>. Thus, caution is required in making comparisons between Vigitel and the PNS, noting that the two strategies are useful tools for surveillance of risk and protective factors for NCDs, mainly pointing trends in the population, and there are advantages and disadvantages to both the strategies, face-to-face and telephone interviews. Importantly, even with some distinct prevalence, the differences between the surveys, in general, were small<sup>10,13</sup>.

The information from Vigitel and the PNS subsidize the elaboration of public policies in the fields of health promotion, surveillance, and care for the Unified Health System (SUS), aligned to the proposals of the Strategic Action Plan to Tackle Noncommunicable Diseases (NCD) in Brazil 2011-2022<sup>8</sup>. In addition, the results of the two surveys also allow the monitoring of reduction goals for tobacco, alcohol, and physical inactivity, among others, established as priorities for national, regional, and global levels of the fight against chronic diseases.

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