

Non-communicable chronic disease risk and protective factor prevalence among adults in Brazilian state capital cities, 2013

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Abstract

Objective: to describe chronic disease risk and protective factor prevalence among adults living in Brazilian state capital cities in 2013 and to verify associated sociodemographic factors. **Methods:** this was a cross-sectional study involving 52,929 telephone interviews; risk and protective factor prevalence was estimated by sex, age and schooling; Poisson Regression was used to investigate associations. **Results:** prevalence was as follows: smoking 11.3% (95%CI: 10.6%;11.9%); alcohol abuse 16.4% (95%CI: 15.7%;17.0%); recommended intake of fruit and vegetables 23.6% (95%CI: 22.9%;24.3%); physical inactivity 16.2% (95%CI: 15.6%;16.9%); overweight 50.8% (95%CI: 49.9%;51.6%); high salt intake 16.0% (95%CI: 15.3%;16.6%); meals replaced with snacks 15.5% (95%CI: 15.8%;17.1%); regular consumption of confectionery 19.5% (95%CI: 18.8%;20.2%). Risk factor presence was associated with male gender, older age and lower schooling. **Conclusion:** monitoring supports planning public policies on health promotion by reducing morbidity and mortality from chronic diseases.

Key words: Risk Factors; Chronic Diseases; Health Surveys; Epidemiological Surveillance; Prevalence.

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Introduction

Life expectancy has increased all over the world. A larger proportion of deaths among the population older than 70 years old can be noticed, while mortality among children under 5 years old has decreased. These facts reflect important progress with the health of the world's population. There has been more control of infectious diseases, and, in some parts of the planet huge progress has been noticed in the prevention of premature deaths from chronic non-communicable diseases (NCD).¹

In Brazil, the probability of death between 30 and 70 years old (early mortality) due to one of the four main NCDs reduced between 1993 and 2010, from 32.3% to 22.8% among men, and from 23.5% to 15.4% among women.²

Despite the reducing trend for early mortality, NCDs are the main causes of death and disability in the global population, besides being responsible for high economic burden for individuals, society and health systems.^{3,4} In 2010, around 8 million people died of cancer, representing an increase of around 30% in the number of deaths from cancer in 20 years. One in every four deaths was caused by heart disease or stroke.⁵ Diabetes was responsible for one to three million deaths.⁵ The biggest risk factors for NCDs are: higher blood pressure, smoking, alcohol abuse and unhealthy diets.⁵ Not only does the presence of risk factors increase mortality for those diseases,⁶ but it also affects quality of life.⁷

In 2011, a Political Declaration was approved at a UN High-Level Meeting, where commitment of the UN members to fighting against NCDs was established.⁸ These members subsequently agreed to adopt nine global goals, including an overarching goal of reducing by 25% early mortality from the four main NCDs (cardiovascular diseases; chronic respiratory diseases; cancer; diabetes), comparing levels in 2010 with levels in 2025 (referred to as the 25x25 goal).⁸

These countries hope that by achieving the global goals of reducing six risk factors (smoking; alcohol abuse; salt consumption; obesity; high blood pressure; glucose), the probability of early mortality (between 30 and 70 years old) from any of the four main NCDs (cardiovascular; chronic respiratory; cancers; diabetes) will reduce significantly in men (22%) and women (19%), from 2010 to 2025.⁹ If these goals are achieved, more

than 37 million deaths caused by non-communicable diseases will be avoided (16 million in the 30-69 age group and 21 million in the 70 or older age group), over 15 years.⁹ It is important to note that most people who will benefit from these goals, if they are achieved, come from low-to-middle-income countries.⁹

Brazil has committed to NCDs prevention and attention by launching the 2011-2022 Strategic Action Plan to Tackle Non-communicable Diseases (NCDs), which defines and prioritizes the actions and investments necessary to prepare the country for the challenge represented by NCDs and their risk factors in the forthcoming years.¹⁰ Knowing about the occurrence and distribution of these risk factors in the population is highly important to inform actions against NCDs.

Despite the reducing trend for early mortality, the NCDs are the main causes of death and disability in the world's population.

This article aims to describe chronic disease risk and protective factor prevalence among adults living in Brazilian state capital cities in 2013 and to verify associated sociodemographic factors.

Methods

This is a cross-sectional study that used data from the Surveillance System of Risk and Protective Factors for Chronic Diseases by Telephone Survey – Vigitel –, collected in 2013. Vigitel's probabilistic sample is formed by the adult population (≥ 18 years old) from the Brazilian state capital cities and the Federal District (DF), who live in households with at least one landline telephone.

Vigitel has conducted continuous yearly monitoring of the NCDs' main risk and protective factors in all Brazilian states capital cities and DF, since 2006.¹¹ Every year, the main telephone companies in the country provide Vigitel with the registers of the landlines in those 27 cities. Vigitel picks 5,000 telephone numbers randomly in each city, divides them into sub-samples of 200 lines each, in order to identify active residential lines and selects the residents that will be interviewed.¹¹

Interviews are computer-assisted and the answers are electronically registered. On average, each interview

takes around 10 minutes. The study questionnaire, comprised of 91 questions related to social-demographic and social-economic aspects, also included modules with groups of risk and protective factors for chronic diseases.¹²

The prevalences of risk and protective factors for NCDs were estimated, divided in eight modules as follows.

a) smoking (in percentage)

- smokers;
- former smokers;
- smokers consuming 20 or more cigarettes a day;
- passive smokers in the household (non-smokers who reported that at least one of the household residents smokes inside the house); and
- passive smokers in the work place (non-smokers who reported that at least one person smokes in the work place)

b) alcohol intake (percentage)

- alcohol abuse (five or more doses for men; four or more doses for women); and
- individuals that affirmed driving motor vehicle after any amount of alcohol intake

c) eating habits

- regular intake of fruit and vegetables (five or more days a week)
- recommended intake of fruit and vegetables (five or more times a day, five or more days a week);
- regular intake of beans (five or more days a week)
- intake of excessively fatty meat (red meat with visible fat or chicken with skin);
- intake of whole milk;
- regular intake of soft drinks or artificial juice (five or more days a week);
- regular intake of confectionery (five or more days a week);
- high salt intake (high or very high self-reported salt intake); and
- lunch or dinner food replaced by a snack (seven or more times a week)

d) physical activity

- practicing the recommended level of free time physical activity (at least 150 minutes per week of light or moderate intensity physical activity, or at least 75 minutes per week of vigorous intensity physical

activity, regardless of the number of days in which there is physical activity per week);

- practicing physical activity while commuting (in the way to work or to school by bike, or walking for at least 150 minutes per week);
- watching TV for at least three or more hours a day.

In 2013, new physical activity indicators were incorporated into Vigitel in order to enable the international comparability and monitoring of the 2011-2022 Strategic Action Plan to Tackle Non-communicable Diseases (NCDs):

- insufficient practice of physical activity (less than 150 minutes of moderate intense activities per week; or less than 75 minutes of vigorous physical activity during free time, while commuting to work/school and in the occupational activity); and
- physically inactive (percentage of adults that did not practice any physical activity in their free time in the last three months, that did not make intense physical effort at work, that did not commute to work or to school on foot or by bike and that are not responsible for heavy-cleaning their homes)

e) Nutritional Status (body mass index - BMI)

- percentage of overweight (BMI ≥ 25 kg/m²) and obesity (BMI ≥ 30 kg/m²)

f) self-related health :

- percentage of individuals that evaluated their own health condition as poor or very poor

g) referred morbidity

- adults reporting medical diagnosis of hypertension; and
- adults reporting medical diagnosis of diabetes

h) exams for early detection of cancer

- women (50-69 years old) that underwent a mammography exam at some time in their lives and in the last two years; and
- women (25-64 years old) that underwent a Pap smear test for cervical cancer detection at some time in their lives and in the last three years

As mentioned above, the prevalence estimates were expressed in proportions (%), with their respective 95% confidence intervals (95%CI). For prevalence calculation, the denominator was the total of adults interviewed. The results were calculated by sex (male; female), age group (18-24; 25-34; 35-44; 45-54; 55-64; and 65 or older) and schooling (0-8; 9-11; and 12 or more years of study).

For the analysis of differences based on sex, age and schooling, we estimated the prevalence ratio (PR), adjusted by age, schooling or both, and their respective 95% confidence intervals - 95%CI-, through the Poisson Regression model with robust variance. Data analyses were conducted with Stata 11.0. For all the analyses, Vigitel's weighting factors were incorporated to consider the unequal probability that individuals living in a household with a larger number of telephone landlines or smaller number of residents had to participate in the sample. Weighting factors were also incorporated to correct the over or underestimation of Vigitel's samples resulting from the unequal coverage of landline telephony in Brazil (using the post-stratification procedure).

If interviewees did not know their weight and height, imputed values of these measures were used. The imputation of missing values was conducted upon the technical procedure *hot deck*, which encompasses several stages. Primarily, the variables associated with the absence of answer are identified; so, the association between the absence of answer and the variables age, sex, education and ethnicity/skin color were investigated. The model that resulted from the investigation enables the creation of groups of respondents and non-respondents with similar aspects for the variables predictors of the condition of non-answer. Finally, in every capital city a person with known information is randomly selected in each group to 'give' their weight and height values to the non-respondent in the same group. Vigitel's methodological details can be found in previous articles.¹²

The Vigitel survey was approved by the Ministry of Health's National Research Ethics Committee, under technical report No. 328,159, dated June 26, 2013. A Consent Term was registered under verbal consensus from the respondent, at the moment of the telephone contact.

Results

52,929 telephone interviews were conducted in the 2013 Vigitel Survey between February and December 2013; 61.7% of them were conducted with female respondents. In around 9% of the eligible landlines, the interview was not conducted because it was not possible to make initial telephone contact with their users (permanently busy lines or connected to an

answering machine) or the individual chosen in the household was not present, even after several attempts to postpone and six telephone calls done on different days and times. Refusals to answer the survey in the initial contact with the household or after the choice of the individual to be interviewed were found in 3.9% of the eligible lines.

Smoking prevalence was 11.3% (95%CI: 10.6%; 11.9%), 22.0% (95%CI:21.3%; 22.7%) of the adults were former smokers and 3.4% (95%CI: 3.0%; 3.8%) reported high consumption of tobacco (20 or more cigarettes a day). The percentage of passive smokers in the household was 10.2% (95%CI: 9.6%; 10.4%) and 9.8% (95%CI:9.2%;10.4%) in the work place (Table 1). Concerning sex, a higher prevalence of smokers, former smokers, and consumption of 20 or more cigarettes a day was found in men compared to women. It is noteworthy that the prevalence of passive smokers in the work place was 2.2 times higher in men than in women (Table 1). The prevalence of smokers was lower in adults aged 65 or older; the younger (18-24 years old) were exposed to passive smoking 2.2 times more (Table 2). With regard to schooling, the prevalences of smokers, former smokers, consumption of 20 or more cigarettes a day and passive smokers in the work place were higher in individuals with up to 8 years of study, regardless of sex (Tables 3 and 4).

With regard to alcohol intake, 16.4% (95%CI: 15.7%; 17%) reported alcohol abuse and 5.2% (95%CI: 4.8%; 5.6%) reported having driven a motor vehicle after any amount of alcohol intake (Table 1). Compared to women, men reported 2.4 times more alcohol abuse and 5.9 more times driving a motor vehicle after any amount of alcohol intake (Table 1). The frequency of alcohol abuse and driving motor vehicle after intake any amount of alcohol was higher in young adults (Table 2). For both sexes, alcohol abuse and driving after alcohol intake was more frequent among the more educated population (Tables 3 and 4).

For food intake indicators, 36% (95%CI: 35.2%; 36.8%) consume fruit and vegetables regularly and only 23.6% (95%CI: 22.9%; 24.3%) reported consuming the recommended amount of fruit and vegetables. Concerning risk factors, 31% (95%CI: 30.1%; 31.8%) consume excessively fatty meat, 53.5% (95%CI: 52.6%; 54.3%) consume whole milk, 23.3% (95%CI: 22.5%; 24.1%) consume soft drinks and 19.5% (95%CI: 18.8%;

Table 1 - Prevalence and prevalence ratio of non-communicable chronic diseases risk and protective factors among adults in Brazilian state capital cities, according to sex, based on data from the Vigitel system.^a Brazil, 2013

| Indicators | Men | | | | Women ^b | | | Total | |
|--|------------|--------------------|-----------------|--------------------|--------------------|--------------------|-----------------|------------|--------------------|
| | Prevalence | 95%CI ^c | PR ^d | 95%CI ^c | Prevalence | 95%CI ^c | PR ^d | Prevalence | 95%CI ^c |
| Smoking | | | | | | | | | |
| Smokers | 14.4 | 13.3; 15.5 | 1.7 | 1.5; 1.8 | 8.6 | 7.9; 9.3 | 1.0 | 11.3 | 10.6; 11.9 |
| Former smokers | 25.6 | 24.4; 26.7 | 1.5 | 1.4; 1.5 | 18.9 | 18.1; 19.8 | 1.0 | 22.0 | 21.3; 22.7 |
| Consumption of 20 or more cigarettes a day | 4.5 | 3.9; 5.2 | 1.9 | 1.5; 2.4 | 2.4 | 2.0; 2.8 | 1.0 | 3.4 | 3.0; 3.8 |
| Passive smokers in the household | 9.6 | 8.7; 10.5 | 0.8 | 0.8; 1.0 | 10.7 | 10.0; 11.5 | 1.0 | 10.2 | 9.6; 10.8 |
| Passive smokers in the work place | 14.1 | 13.1; 15.2 | 2.2 | 2.0; 2.5 | 6.1 | 5.5; 6.7 | 1.0 | 9.8 | 9.2; 10.4 |
| Alcohol intake | | | | | | | | | |
| Alcohol abuse | 24.2 | 23.0; 25.4 | 2.4 | 2.2; 2.6 | 9.7 | 9.0; 10.4 | 1.0 | 16.4 | 15.7; 17.0 |
| Driving motor vehicle after any amount of alcoholic drink intake | 9.4 | 8.6; 10.1 | 5.9 | 4.8; 7.4 | 1.6 | 1.3; 1.9 | 1.0 | 5.2 | 4.8; 5.6 |
| Eating habits | | | | | | | | | |
| Fruit and Vegetables regularly | 29.6 | 28.4; 30.8 | 0.7 | 0.7; 0.8 | 41.5 | 40.4; 42.5 | 1.0 | 36.0 | 35.2; 36.8 |
| Recommended amount of fruit and vegetables | 19.3 | 18.2; 20.4 | 0.7 | 0.7; 0.8 | 27.3 | 26.3; 28.2 | 1.0 | 23.6 | 22.9; 24.3 |
| Regular beans intake | 73.0 | 71.8; 74.2 | 1.2 | 1.1; 1.2 | 61.7 | 60.6; 62.7 | 1.0 | 66.9 | 66.1; 67.7 |
| Excessively fatty meat | 41.2 | 39.9; 42.6 | 1.8 | 1.7; 1.9 | 22.2 | 21.2; 23.1 | 1.0 | 31.0 | 30.1; 31.8 |
| Whole milk | 56.6 | 55.2; 57.9 | 1.1 | 1.1; 1.1 | 50.9 | 49.8; 52.0 | 1.0 | 53.5 | 52.6; 54.3 |
| Regular soft drinks intake | 26.7 | 25.4; 28.0 | 1.2 | 1.1; 1.3 | 20.4 | 19.4; 21.3 | 1.0 | 23.3 | 22.5; 24.1 |
| Regular confectionery intake | 16.9 | 15.9; 18.0 | 0.8 | 0.7; 0.8 | 21.6 | 20.7; 22.6 | 1.0 | 19.5 | 18.8; 20.2 |
| High salt intake | 17.9 | 16.8; 19.0 | 1.2 | 1.1; 1.3 | 14.3 | 13.6; 15.1 | 1.0 | 16.0 | 15.3; 16.6 |
| Replacement of lunch or dinner by snacks | 12.6 | 11.7; 13.5 | 0.7 | 0.6; 0.7 | 19.7 | 18.9; 20.6 | 1.0 | 15.5 | 15.8; 17.1 |
| Physical activity | | | | | | | | | |
| Practice of the recommended level of free time physical activity | 41.2 | 39.9; 42.5 | 1.5 | 1.4; 1.6 | 27.4 | 26.5; 28.3 | 1.0 | 33.8 | 33.0; 34.6 |
| Practice of physical activity when commuting | 12.2 | 11.2; 13.2 | 1.0 | 0.9; 1.1 | 11.9 | 11.2; 12.7 | 1.0 | 12.1 | 11.5; 12.7 |
| Insufficient practice of physical activity | 39.9 | 38.6; 41.3 | 0.7 | 0.7; 0.7 | 57.4 | 56.3; 58.5 | 1.0 | 49.4 | 48.5; 50.2 |
| Physically inactive | 16.8 | 15.8; 17.8 | 1.1 | 1.1; 1.2 | 15.7 | 15.0; 16.5 | 1.0 | 16.2 | 15.6; 16.9 |
| Watch TV for three or more hours a day | 28.1 | 26.8; 29.3 | 1.0 | 0.9; 1.0 | 29.0 | 28.0; 30.0 | 1.0 | 28.6 | 27.8; 29.4 |
| Body mass index (BMI)^e | | | | | | | | | |
| Overweight | 54.7 | 53.4; 56.1 | 1.2 | 1.1; 1.2 | 47.4 | 46.3; 48.5 | 1.0 | 50.8 | 49.9; 51.6 |
| Obesity | 17.5 | 16.5; 18.5 | 1.0 | 1.0; 1.1 | 17.5 | 16.7; 18.4 | 1.0 | 17.5 | 16.9; 18.2 |
| Self-rated health | | | | | | | | | |
| Health status considered poor | 3.8 | 3.2; 4.3 | 0.7 | 0.6; 0.8 | 5.8 | 5.3; 6.3 | 1.0 | 4.9 | 4.5; 5.3 |
| Reported morbidity | | | | | | | | | |
| Hypertension | 21.5 | 20.4; 22.5 | 0.9 | 0.9; 1.0 | 26.3 | 25.4; 27.3 | 1.0 | 24.1 | 23.4; 24.8 |
| Diabetes | 6.5 | 5.8; 7.2 | 1.1 | 0.9; 1.2 | 7.2 | 6.7; 7.7 | 1.0 | 6.9 | 6.5; 7.3 |
| Dyslipidemia | 17.2 | 16.2; 18.2 | 0.8 | 0.8; 0.9 | 22.9 | 22.1; 23.8 | 1.0 | 20.3 | 19.6; 20.9 |
| Early cancer detection exams | | | | | | | | | |
| Mammography once in lifetime | – | – | – | – | 89.7 | 88.5; 90.9 | – | – | – |
| Mammography in the last two years | – | – | – | – | 78.0 | 76.4; 79.6 | – | – | – |
| Pap smear once in lifetime | – | – | – | – | 88.1 | 87.4; 88.9 | – | – | – |
| Pap smear in the last three years | – | – | – | – | 82.9 | 81.9; 83.8 | – | – | – |

a) Surveillance System of Risk and Protective Factors for Chronic Diseases by Telephone Survey (Vigitel)/SVS/MS

b) Category of reference

c) 95%CI: 95% confidence interval

d) PR: prevalence ratio, adjusted by age and schooling.

e) Data imputation

Table 2 - Distribution of non-communicable chronic diseases risk and protective factors among adults in Brazilian state capital cities, according to age group, based on data from the Vigitel system.^a Brazil, 2013

| Indicators | 18 to 24 years old | | | | 25 to 34 years old | | | | 34 to 44 years old | | | |
|--|--------------------|--------------------|-----------------|--------------------|--------------------|--------------------|-----------------|--------------------|--------------------|--------------------|-----------------|--------------------|
| | Prevalence | 95%CI ^c | PR ^d | 95%CI ^c | Prevalence | 95%CI ^c | PR ^d | 95%CI ^c | Prevalence | 95%CI ^c | PR ^d | 95%CI ^c |
| Smoking | | | | | | | | | | | | |
| Smokers | 7.1 | 5.7; 8.4 | 1.4 | 1.1; 1.8 | 12.1 | 10.7; 13.6 | 2.4 | 1.9; 3.1 | 11.2 | 9.8; 12.6 | 2.0 | 1.6; 2.5 |
| Former smokers | 10.3 | 8.9; 11.7 | 0.3 | 0.3; 0.4 | 13.2 | 11.8; 14.6 | 0.4 | 0.4; 0.5 | 17.7 | 16.2; 19.2 | 0.5 | 0.5; 0.6 |
| Consumption of 20 or more cigarettes a day | 1.8 | 0.9; 2.7 | 1.0 | 0.5; 1.8 | 2.7 | 1.9; 3.5 | 1.5 | 0.9; 2.5 | 3.3 | 2.5; 4.2 | 1.6 | 1.0; 2.6 |
| Passive smokers in the household | 16.7 | 15.0; 18.5 | 2.2 | 1.8; 2.7 | 11.6 | 10.2; 12.9 | 1.6 | 1.3; 1.9 | 8.0 | 6.9; 9.1 | 1.0 | 0.8; 1.3 |
| Passive smokers in the work place | 9.2 | 7.8; 10.5 | 4.8 | 3.6; 6.4 | 11.8 | 10.5; 13.1 | 6.3 | 4.8; 8.3 | 13.1 | 11.6; 14.6 | 6.3 | 4.8; 8.3 |
| Alcohol intake | | | | | | | | | | | | |
| Alcohol abuse | 19.0 | 17.1; 20.8 | 4.4 | 3.5; 5.6 | 22.7 | 21.0; 24.3 | 5.2 | 4.1; 6.6 | 17.5 | 16.0; 19.0 | 4.1 | 3.3; 5.3 |
| Driving motor vehicle after any amount of alcoholic drink intake | 4.8 | 4.0; 5.7 | 3.8 | 2.8; 5.2 | 9.0 | 7.9; 10.2 | 6.7 | 4.9; 9.1 | 4.7 | 4.0; 5.4 | 4.0 | 2.9; 5.4 |
| Eating habits | | | | | | | | | | | | |
| Fruit and Vegetables regularly | 27.1 | 25.2; 29.1 | 0.5 | 0.4; 0.5 | 30.6 | 28.8; 32.3 | 0.5 | 0.5; 0.5 | 34.5 | 32.7; 36.3 | 0.6 | 0.6; 0.7 |
| Recommended amount of fruit and vegetables | 18.9 | 17.1; 20.7 | 0.6 | 0.5; 0.6 | 21.5 | 19.9; 23.1 | 0.6 | 0.6; 0.7 | 22.8 | 21.2; 24.4 | 0.7 | 0.6; 0.8 |
| Regular beans intake | 70.4 | 68.4; 72.4 | 1.3 | 1.2; 1.3 | 67.3 | 65.5; 69.1 | 1.2 | 1.2; 1.3 | 67.2 | 65.5; 68.9 | 1.2 | 1.1; 1.2 |
| Excessively fatty meat | 38.9 | 36.6; 41.1 | 2.3 | 2.0; 2.5 | 36.9 | 35.0; 38.9 | 2.2 | 2.0; 2.4 | 31.1 | 29.3; 33.0 | 1.8 | 1.6; 2.0 |
| Whole milk | 59.8 | 57.6; 62.0 | 1.4 | 1.3; 1.5 | 56.6 | 54.6; 58.5 | 1.3 | 1.2; 1.4 | 56.5 | 54.6; 58.5 | 1.3 | 1.2; 1.4 |
| Regular soft drinks intake | 33.2 | 30.9; 35.4 | 3.3 | 2.9; 3.9 | 29.8 | 27.9; 31.7 | 3.0 | 2.6; 3.5 | 24.1 | 22.3; 25.8 | 2.3 | 2.0; 2.7 |
| Regular confectionery intake | 29.1 | 27.0; 31.2 | 1.8 | 1.6; 2.1 | 23.9 | 22.2; 25.6 | 1.5 | 1.4 | 16.6 | 15.2; 18.1 | 1.1 | 1.0; 1.3 |
| High salt intake | 22.1 | 20.2; 24.0 | 3.3 | 2.7; 4.1 | 20.0 | 18.5; 21.6 | 3.0 | 2.5; 3.7 | 17.1 | 15.6; 18.7 | 2.6 | 2.1; 3.2 |
| Replacement of lunch or dinner by snacks | 15.3 | 13.6; 16.9 | 0.6 | 0.5; 0.6 | 14.1 | 12.8; 15.4 | 0.5 | 0.4; 0.6 | 14.6 | 13.3; 15.9 | 0.5 | 0.5; 0.6 |
| Physical activity | | | | | | | | | | | | |
| Practice of the recommended level of free time physical activity | 49.7 | 47.4; 52.0 | 1.8 | 1.6; 1.9 | 39.3 | 37.4; 41.2 | 1.3 | 1.2; 1.5 | 29.6 | 27.9; 31.3 | 1.1 | 1.0; 1.2 |
| Practice of physical activity when commuting | 13.8 | 12.1; 15.5 | 5.3 | 4.2; 6.8 | 12.6 | 11.3; 14.0 | 4.9 | 3.9; 6.3 | 15.0 | 13.5; 16.6 | 5.6 | 4.4; 7.0 |
| Insufficient practice of physical activity | 37.2 | 35.0; 39.4 | 0.5 | 0.5; 0.6 | 42.5 | 40.6; 44.4 | 0.6 | 0.6; 0.7 | 47.6 | 45.7; 49.6 | 0.7 | 0.6; 0.7 |
| Physically inactive | 13.7 | 12.2; 15.2 | 0.4 | 0.3; 0.4 | 11.6 | 10.3; 12.8 | 0.3 | 0.3; 0.4 | 12.4 | 11.2; 13.7 | 0.3 | 0.3; 0.4 |
| Watch TV for three or more hours a day | 29.5 | 27.3; 31.6 | 1.0 | 0.9; 1.1 | 27.9 | 26.1; 29.7 | 0.9 | 0.8; 1.0 | 26.3 | 24.6; 28.0 | 0.8 | 0.8; 0.9 |
| Body mass index (BMI)^e | | | | | | | | | | | | |
| Overweight | 29.7 | 27.7; 31.8 | 0.5 | 0.5; 0.6 | 45.3 | 43.3; 47.2 | 0.8 | 0.8; 0.9 | 56.4 | 54.5; 58.3 | 1.0 | 1.0; 1.1 |
| Obesity | 6.3 | 5.3; 7.3 | 0.3 | 0.3; 0.4 | 15.0 | 13.7; 16.4 | 0.8 | 0.7; 1.0 | 20.1 | 18.5; 21.6 | 1.1 | 0.9; 1.2 |
| Self-rated health | | | | | | | | | | | | |
| Health status considered poor | 2.7 | 2.1; 3.3 | 0.5 | 0.4; 0.7 | 3.3 | 2.6; 4.0 | 0.7 | 0.5; 0.9 | 4.4 | 3.6; 5.2 | 0.7 | 0.6; 1.0 |
| Reported morbidity | | | | | | | | | | | | |
| Hypertension | 3.0 | 2.4; 3.6 | 0.1 | 0.0; 0.1 | 8.1 | 7.1; 9.1 | 0.2 | 0.1; 0.2 | 18.3 | 16.8; 19.8 | 0.3 | 0.3; 0.4 |
| Diabetes | 0.8 | 0.3; 1.3 | 0.0 | 0.0; 0.1 | 1.2 | 0.8; 1.6 | 0.1 | 0.0; 0.1 | 3.6 | 2.8; 4.4 | 0.2 | 0.2; 0.2 |
| Early cancer detection exams | | | | | | | | | | | | |
| Mammography once in lifetime | - | - | - | - | - | - | - | - | - | - | - | - |
| Mammography in the last two years | - | - | - | - | - | - | - | - | - | - | - | - |
| Pap smear once in lifetime | - | - | - | - | 82.6 | 80.9; 84.3 | 0.9 | 0.9; 0.9 | 89.8 | 88.6; 91.1 | 1.0 | 1.0; 1.0 |
| Pap smear in the last three years | - | - | - | - | 78.8 | 76.8; 80.8 | 0.9 | 0.9; 1.0 | 85.2 | 83.6; 86.8 | 1.0 | 1.0; 1.0 |

a) Surveillance System of Risk and Protective Factors for Chronic Diseases by Telephone Survey (Vigitel)/SVS/MS

b) Category of reference

c) 95%CI: 95% confidence interval

d) PR: prevalence ratio, adjusted by age and schooling.

e) Low accuracy

f) Data imputation

Continuation

Table 2 - Distribution of non-communicable chronic diseases risk and protective factors among adults in Brazilian state capital cities, according to age group, based on data from the Vigitel system.^a Brazil, 2013

| Indicators | 45 to 54 years old | | | | 55 to 64 years old | | | | 65 years or older ^b | | |
|--|--------------------|--------------------|-----------------|--------------------------------|--------------------|--------------------|-----------------|--------------------------------|--------------------------------|--------------------|-----------------|
| | Prevalence | 95%CI ^c | PR ^d | CI _{95%} ^e | Prevalence | 95%CI ^c | PR ^d | CI _{95%} ^e | Prevalence | 95%CI ^c | PR ^d |
| Smoking | | | | | | | | | | | |
| Smokers | 15.1 | 13.6; 16.7 | 2.6 | 2.1; 3.2 | 13.6 | 12.0; 15.2 | 2.2 | 1.8; 2.7 | 6.9 | 5.6; 8.1 | 1.0 |
| Former smokers | 30.1 | 28.2; 32.0 | 0.9 | 0.8; 1.0 | 39.1 | 36.9; 41.3 | 1.1 | 1.0; 1.2 | 37.0 | 35.0; 39.1 | 1.0 |
| Consumption of 20 or more cigarettes a day | 5.5 | 4.5; 6.6 | 2.6 | 1.7; 3.9 | 4.6 | 3.8; 5.5 | 2.0 | 1.3; 3.0 | 2.6 | 1.7; 3.6 | 1.0 |
| Passive smokers in the household | 6.6 | 5.6; 7.6 | 0.9 | 0.7; 1.1 | 9.1 | 7.7; 10.6 | 1.2 | 0.9; 1.4 | 8.2 | 7.0; 9.5 | 1.0 |
| Passive smokers in the work place | 9.8 | 8.6; 11.0 | 4.5 | 3.5; 5.9 | 7.4 | 6.1; 8.7 | 3.2 | 2.4; 4.4 | 2.5 | 1.9; 3.1 | 1.0 |
| Alcohol intake | | | | | | | | | | | |
| Alcohol abuse | 15.0 | 13.6; 16.4 | 3.6 | 2.8; 4.6 | 10.5 | 9.3; 11.7 | 2.6 | 2.0; 3.3 | 4.0 | 3.1; 4.8 | 1.0 |
| Driving motor vehicle after any amount of alcoholic drink intake | 4.4 | 3.7; 5.2 | 3.9 | 2.9; 5.3 | 2.8 | 2.1; 3.5 | 2.7 | 1.9; 3.8 | 0.9 | 0.7; 1.2 | 1.0 |
| Eating habits | | | | | | | | | | | |
| Fruit and Vegetables regularly | 41.0 | 39.1; 42.9 | 0.8 | 0.7; 0.8 | 44.6 | 42.4; 46.7 | 0.9 | 0.8; 0.9 | 47.8 | 45.8; 49.9 | 1.0 |
| Recommended amount of fruit and vegetables | 26.2 | 24.5; 27.9 | 0.8 | 0.8; 0.9 | 29.3 | 27.3; 31.3 | 1.0 | 0.9; 1.1 | 26.8 | 24.9; 28.6 | 1.0 |
| Regular beans intake | 67.6 | 65.5; 69.4 | 1.2 | 1.1; 1.2 | 64.2 | 62.2; 66.3 | 1.1 | 1.0; 1.1 | 61.8 | 59.9; 63.8 | 1.0 |
| Excessively fatty meat | 27.5 | 25.7; 29.4 | 1.5 | 1.4; 1.7 | 22.2 | 20.3; 24.2 | 1.2 | 1.1; 1.4 | 19.4 | 17.7; 21.1 | 1.0 |
| Whole milk | 50.0 | 48.0; 52.0 | 1.1 | 1.1; 1.2 | 44.5 | 42.3; 46.7 | 1.0 | 0.9; 1.0 | 46.6 | 44.5; 48.6 | 1.0 |
| Regular soft drinks intake | 17.5 | 16.0; 19.1 | 1.7 | 1.4; 1.9 | 13.2 | 11.6; 14.8 | 1.2 | 1.0; 1.4 | 11.4 | 10.0; 12.8 | 1.0 |
| Regular confectionery intake | 15.0 | 13.6; 16.5 | 1.0 | 0.9; 1.2 | 13.4 | 12.0; 14.9 | 0.9 | 0.8; 1.1 | 13.3 | 11.9; 14.6 | 1.0 |
| High salt intake | 13.2 | 11.8; 14.6 | 2.0 | 1.6; 2.5 | 9.5 | 8.3; 10.8 | 1.5 | 1.2; 1.9 | 6.3 | 5.2; 7.4 | 1.0 |
| Replacement of lunch or dinner by snacks | 16.4 | 13.3; 15.9 | 0.6 | 0.6; 0.7 | 20.0 | 18.3; 21.7 | 0.8 | 0.7; 0.9 | 23.7 | 22.0; 25.3 | 1.0 |
| Physical activity | | | | | | | | | | | |
| Practice of the recommended level of free time physical activity | 27.3 | 25.7; 29.0 | 1.1 | 1.0; 1.2 | 26.6 | 24.9; 28.4 | 1.1 | 1.0; 1.2 | 22.3 | 20.7; 24.0 | 1.0 |
| Practice of physical activity when commuting | 13.5 | 12.1; 14.8 | 4.9 | 3.9; 6.2 | 9.4 | 8.1; 10.8 | 3.3 | 2.6; 4.3 | 3.0 | 2.4; 3.6 | 1.0 |
| Insufficient practice of physical activity | 52.0 | 50.0; 53.9 | 0.7 | 0.7; 0.8 | 58.3 | 56.1; 60.4 | 0.8 | 0.8; 0.8 | 73.5 | 71.8; 75.3 | 1.0 |
| Physically inactive | 13.7 | 12.3; 15.1 | 0.4 | 0.3; 0.4 | 20.2 | 18.3; 22.1 | 0.5 | 0.5; 0.6 | 38.4 | 36.3; 40.5 | 1.0 |
| Watch TV for three or more hours a day | 26.5 | 24.6; 28.3 | 0.8 | 0.8; 0.9 | 30.7 | 28.6; 32.8 | 0.9 | 0.9; 1.0 | 34.3 | 32.4; 36.3 | 1.0 |
| Body mass index (BMI)^e | | | | | | | | | | | |
| Overweight | 60.7 | 58.8; 62.6 | 1.1 | 1.1; 1.2 | 62.7 | 60.6; 64.7 | 1.1 | 1.1; 1.2 | 56.3 | 54.2; 58.3 | 1.0 |
| Obesity | 22.5 | 20.8; 24.2 | 1.2 | 1.1; 1.3 | 24.4 | 22.3; 26.4 | 1.3 | 1.1; 1.4 | 20.2 | 18.6; 21.9 | 1.0 |
| Self-rated health | | | | | | | | | | | |
| Health status considered poor | 6.3 | 5.2; 7.4 | 1.0 | 0.8; 1.3 | 6.8 | 5.6; 8.0 | 1.0 | 0.8; 1.2 | 8.5 | 7.1; 9.8 | 1.0 |
| Reported morbidity | | | | | | | | | | | |
| Hypertension | 34.1 | 32.2; 36.0 | 0.6 | 0.6; 0.7 | 50.3 | 48.1; 52.5 | 0.9 | 0.8; 0.9 | 60.4 | 58.3; 62.4 | 1.0 |
| Diabetes | 8.5 | 7.3; 9.7 | 0.4 | 0.4; 0.5 | 17.1 | 15.2; 18.9 | 0.8 | 0.7; 1.0 | 22.1 | 20.4; 23.8 | 1.0 |
| Early cancer detection exams | | | | | | | | | | | |
| Mammography once in lifetime | 89.7 | | 1.0 | 0.9; 1.0 | 89.9 | | 1.0 | 1.0; 1.0 | 89.2 | | 1.0 |
| Mammography in the last two years | 79.7 | | 1.0 | 1.0; 1.0 | 78.0 | | 1.0 | 1.0; 1.1 | 73.5 | | 1.0 |
| Pap smear once in lifetime | 92.2 | 91.0; 93.4 | 1.0 | 1.0; 1.0 | 90.2 | 88.6; 91.8 | 1.0 | – | – | – | – |
| Pap smear in the last three years | 86.5 | 84.8; 88.1 | 1.0 | 1.0; 1.1 | 81.8 | 79.8; 83.9 | 1.0 | – | – | – | – |

a) Surveillance System of Risk and Protective Factors for Chronic Diseases by Telephone Survey (Vigitel)/SVS/MS

b) Category of reference

c) 95%CI: 95% confidence interval

d) PR: prevalence ratio, adjusted by schooling.

e) Low accuracy

f) Data imputation

Table 3 - Non-communicable chronic diseases risk and protective factor prevalence among male adults in Brazilian state capital cities, according to schooling, based on data from the Vigitel system.^a Brazil, 2013

| Indicators | Men | | | | | | | | | | | |
|--|-----------------------|--------------------|-----------------|--------------------------------|------------------------|--------------------|-----------------|--------------------|--|--------------------|-----------------|--|
| | 0 to 8 years of study | | | | 9 to 11 years of study | | | | 12 or more years of study ^b | | | |
| | Prevalence | 95%CI ^c | PR ^d | CI _{95%} ^c | Prevalence | 95%CI ^c | PR ^d | 95%CI ^c | Prevalence | 95%CI ^c | PR ^d | |
| Smoking | | | | | | | | | | | | |
| Smokers | 19.1 | 16.9; 21.2 | 2.1 | 1.7; 2.6 | 12.9 | 11.4; 14.4 | 1.3 | 1.1; 1.6 | 9.7 | 8.1; 11.4 | 1.0 | |
| Former smokers | 35.9 | 33.5; 38.3 | 1.4 | 1.2; 1.6 | 20.1 | 18.6; 21.6 | 1.1 | 1.0; 1.3 | 18.5 | 16.7; 20.2 | 1.0 | |
| Consumption of 20 or more cigarettes a day | 6.6 | 5.2; 7.9 | 2.4 | 1.6; 3.7 | 3.9 | 2.9; 4.8 | 1.6 | 1.0; 2.4 | 2.5 | 1.7; 3.3 | 1.0 | |
| Passive smokers in the household | 8.7 | 7.1; 10.2 | 1.3 | 1.0; 1.8 | 11.4 | 10.0; 12.8 | 1.4 | 1.1; 1.7 | 8.1 | 6.6; 9.7 | 1.0 | |
| Passive smokers in the work place | 18.0 | 16.0; 20.0 | 2.6 | 2.1; 3.2 | 14.4 | 12.9; 15.8 | 1.8 | 1.4; 2.2 | 8.0 | 6.6; 9.5 | 1.0 | |
| Alcohol intake | | | | | | | | | | | | |
| Alcohol abuse | 20.2 | 18.2; 22.3 | 0.8 | 0.7; 1.0 | 25.4 | 23.6; 27.1 | 0.9 | 0.8; 1.0 | 28.4 | 26.1; 30.6 | 1.0 | |
| Driving motor vehicle after any amount of alcoholic drink intake | 5.4 | 4.2; 6.5 | 0.4 | 0.3; 0.5 | 9.6 | 8.4; 10.7 | 0.6 | 0.5; 0.7 | 15.1 | 13.4; 16.8 | 1.0 | |
| Eating habits | | | | | | | | | | | | |
| Fruit and Vegetables regularly | 24.6 | 22.4; 26.7 | 0.5 | 0.5; 0.6 | 28.1 | 26.3; 29.9 | 0.7 | 0.7; 0.8 | 39.5 | 37.1; 42.0 | 1.0 | |
| Recommended amount of fruit and vegetables | 15.3 | 13.5; 17.0 | 0.5 | 0.5; 0.6 | 19.4 | 17.7; 21.0 | 0.8 | 0.7; 0.9 | 25.3 | 23.1; 27.5 | 1.0 | |
| Regular beans intake | 76.8 | 74.8; 78.8 | 1.2 | 1.2; 1.3 | 74.4 | 72.7; 76.1 | 1.1 | 1.1; 1.2 | 65.1 | 62.8; 67.5 | 1.0 | |
| Excessively fatty meat | 42.5 | 39.9; 45.0 | 1.3 | 1.2; 1.5 | 42.8 | 40.7; 44.8 | 1.1 | 1.0; 1.2 | 37.0 | 34.5; 39.4 | 1.0 | |
| Whole milk | 54.4 | 51.8; 56.9 | 1.1 | 1.0; 1.2 | 60.9 | 58.9; 62.9 | 1.1 | 1.1; 1.2 | 53.1 | 50.7; 55.6 | 1.0 | |
| Regular soft drinks intake | 26.7 | 24.2; 29.2 | 1.5 | 1.3; 1.7 | 29.4 | 27.5; 31.4 | 1.3 | 1.1; 1.4 | 22.4 | 20.3; 24.5 | 1.0 | |
| Regular confectionery intake | 13.2 | 11.4; 15.0 | 0.7 | 0.6; 0.9 | 17.8 | 16.2; 19.5 | 0.8 | 0.7; 0.9 | 21.2 | 19.1; 23.3 | 1.0 | |
| High salt intake | 15.0 | 13.0; 17.0 | 0.8 | 0.7; 1.0 | 18.8 | 17.2; 20.4 | 0.9 | 0.8; 1.0 | 20.9 | 18.8; 22.9 | 1.0 | |
| Replacement of lunch or dinner by snacks | 10.5 | 9.0; 12.1 | 0.6 | 0.5; 0.7 | 12.9 | 11.6; 14.3 | 0.9 | 0.8; 1.0 | 15.2 | 13.6; 16.7 | 1.0 | |
| Physical activity | | | | | | | | | | | | |
| Practice of the recommended level of free time physical activity | 25.1 | 23.0; 27.2 | 0.5 | 0.5; 0.6 | 48.4 | 46.4; 50.4 | 0.9 | 0.8; 0.9 | 54.3 | 51.8; 56.8 | 1.0 | |
| Practice of physical activity when commuting | 13.2 | 11.4; 15.1 | 1.6 | 1.3; 2.0 | 12.7 | 11.3; 14.2 | 1.3 | 1.0; 1.6 | 9.8 | 8.2; 13.2 | 1.0 | |
| Insufficient practice of physical activity | 47.5 | 45.0; 50.0 | 1.1 | 1.0; 1.1 | 34.5 | 32.6; 36.4 | 1.0 | 0.9; 1.0 | 36.9 | 34.5; 39.4 | 1.0 | |
| Physically inactive | 23.2 | 21.1; 25.3 | 1.2 | 1.0; 1.4 | 12.4 | 11.2; 13.6 | 0.9 | 0.8; 1.1 | 14.1 | 12.3; 15.8 | 1.0 | |
| Watch TV for three or more hours a day | 30.7 | 28.3; 33.1 | 1.5 | 1.3; 1.7 | 30.2 | 28.3; 32.1 | 1.4 | 1.3; 1.6 | 20.9 | 19.0; 22.9 | 1.0 | |
| Body mass index (BMI)^e | | | | | | | | | | | | |
| Overweight | 57.8 | 55.3; 60.3 | 0.9 | 0.9; 1.0 | 50.4 | 48.4; 52.5 | 0.9 | 0.8; 1.0 | 56.9 | 54.3; 59.4 | 1.0 | |
| Obesity | 19.9 | 17.8; 22.0 | 1.0 | 0.9; 1.2 | 15.2 | 13.8; 16.5 | 0.9 | 0.8; 1.0 | 17.5 | 15.7; 19.3 | 1.0 | |
| Self-rated health | | | | | | | | | | | | |
| Health status considered poor | 5.8 | 4.6; 7.1 | 2.3 | 1.5; 3.5 | 2.9 | 2.3; 3.6 | 1.4 | 1.0; 2.2 | 2.1 | 1.4; 2.8 | 1.0 | |
| Reported morbidity | | | | | | | | | | | | |
| Hypertension | 31.1 | 28.8; 33.3 | 1.1 | 1.0; 1.3 | 15.2 | 13.9; 16.4 | 1.0 | 0.9; 1.1 | 16.7 | 15.1; 18.4 | 1.0 | |
| Diabetes | 11.1 | 9.5; 12.6 | 1.5 | 1.2; 2.0 | 3.8 | 3.1; 4.4 | 1.0 | 0.8; 1.3 | 3.9 | 3.1; 4.7 | 1.0 | |
| Dyslipidemia | 20.6 | 18.5; 22.6 | 0.8 | 0.7; 1.0 | 13.4 | 12.3; 14.6 | 0.8 | 0.7; 0.9 | 17.9 | 16.1; 19.6 | 1.0 | |

a) Surveillance System of Risk and Protective Factors for Chronic Diseases by Telephone Survey (Vigitel)/SVS/MS

b) Category of reference

c) 95%CI: 95% confidence interval

d) PR: prevalence ratio, adjusted by age.

e) Data imputation

Table 4 - Non-communicable chronic diseases risk and protective factor prevalence among female adults in Brazilian state capital cities, according to schooling, based on data from the Vigitel system.^a Brazil, 2013

| Indicators | Women | | | | | | | | | | | |
|--|-----------------------|--------------------|-----------------|--------------------|------------------------|--------------------|-----------------|--------------------|--|--------------------|-----------------|--|
| | 0 to 8 years of study | | | | 9 to 11 years of study | | | | 12 or more years of study ^c | | | |
| | Prevalence | 95%CI ^b | PR ^c | 95%CI ^b | Prevalence | 95%CI ^b | PR ^c | 95%CI ^b | Prevalence | 95%CI ^b | PR ^c | |
| Smoking | | | | | | | | | | | | |
| Smokers | 11.5 | 10.1; 12.8 | 2.1 | 1.7; 2.6 | 8.0 | 6.8; 9.1 | 1.4 | 1.2; 1.8 | 5.5 | 4.6; 6.5 | 1.0 | |
| Former smokers | 26.0 | 24.3; 27.7 | 1.5 | 1.3; 1.7 | 16.4 | 15.2; 17.7 | 1.3 | 1.1; 1.4 | 12.8 | 11.6; 14.0 | 1.0 | |
| Consumption of 20 or more cigarettes a day | 3.5 | 2.7; 4.4 | 3.6 | 2.1; 6.1 | 2.4 | 1.6; 3.1 | 2.5 | 1.5; 4.1 | 1.0 | 0.6; 1.3 | 1.0 | |
| Passive smokers in the household | 10.3 | 9.0; 11.6 | 1.2 | 1.0; 1.5 | 11.3 | 10.1; 12.5 | 1.1 | 0.9; 1.3 | 10.5 | 9.2; 11.9 | 1.0 | |
| Passive smokers in the work place | 4.4 | 3.6; 5.1 | 1.2 | 0.9; 1.5 | 8.4 | 7.3; 9.5 | 1.6 | 1.3; 2.1 | 5.3 | 4.3; 6.2 | 1.0 | |
| Alcohol intake | | | | | | | | | | | | |
| Alcohol abuse | 6.4 | 5.3; 7.4 | 0.7 | 0.6; 0.9 | 10.6 | 9.4; 11.7 | 0.8 | 0.7; 1.0 | 13.0 | 11.5; 14.4 | 1.0 | |
| Driving motor vehicle after any amount of alcoholic drink intake | 0.5 | 0.1; 0.9 | 0.2 | 0.1; 0.5 | 1.1 | 0.6; 1.6 | 0.3 | 0.2; 0.5 | 3.6 | 2.9; 4.3 | 1.0 | |
| Eating habits | | | | | | | | | | | | |
| Fruit and Vegetables regularly | 38.7 | 36.8; 40.5 | 0.6 | 0.6; 0.6 | 38.1 | 36.5; 39.7 | 0.7 | 0.7; 0.8 | 49.8 | 47.8; 51.8 | 1.0 | |
| Recommended amount of fruit and vegetables | 23.1 | 21.4; 24.7 | 0.5 | 0.5; 0.6 | 26.4 | 24.9; 28.0 | 0.8 | 0.7; 0.8 | 33.9 | 32.1; 35.8 | 1.0 | |
| Regular beans intake | 66.0 | 64.2; 67.8 | 1.3 | 1.2; 1.4 | 63.4 | 68.8; 65.0 | 1.2 | 1.1; 1.2 | 53.6 | 51.6; 55.5 | 1.0 | |
| Excessively fatty meat | 21.0 | 19.3; 22.6 | 1.3 | 1.2; 1.5 | 24.3 | 22.7; 25.8 | 1.2 | 1.1; 1.3 | 21.0 | 19.3; 22.6 | 1.0 | |
| Whole milk | 50.9 | 48.9; 52.8 | 1.3 | 1.2; 1.3 | 55.2 | 53.5; 56.9 | 1.2 | 1.2; 1.3 | 44.9 | 42.9; 46.9 | 1.0 | |
| Regular soft drinks intake | 18.2 | 16.4; 19.9 | 1.3 | 1.2; 1.5 | 22.7 | 21.1; 24.2 | 1.2 | 1.0; 1.3 | 20.2 | 18.4; 21.9 | 1.0 | |
| Regular confectionery intake | 13.8 | 12.3; 15.2 | 0.6 | 0.5; 0.6 | 23.0 | 21.5; 24.6 | 0.8 | 0.7; 0.8 | 30.3 | 28.4; 32.2 | 1.0 | |
| High salt intake | 11.1 | 9.8; 12.4 | 1.0 | 0.8; 1.1 | 15.3 | 14.0; 16.5 | 0.9 | 0.8; 1.0 | 17.5 | 16.0; 19.0 | 1.0 | |
| Replacement of lunch or dinner by snacks | 18.5 | 17.1; 19.9 | 0.7 | 0.6; 0.8 | 19.1 | 17.8; 20.5 | 0.8 | 0.8; 0.9 | 22.2 | 20.6; 23.8 | 1.0 | |
| Physical activity | | | | | | | | | | | | |
| Practice of the recommended level of free time physical activity | 19.3 | 17.8; 20.8 | 0.5 | 0.5; 0.6 | 27.3 | 25.8; 28.7 | 0.7 | 0.7; 0.8 | 38.4 | 36.5; 40.4 | 1.0 | |
| Practice of physical activity when commuting | 10.8 | 9.6; 12.1 | 1.3 | 1.0; 1.5 | 13.3 | 12.1; 14.5 | 1.2 | 1.0; 1.4 | 11.5 | 10.1; 13.0 | 1.0 | |
| Insufficient practice of physical activity | 65.8 | 63.9; 67.6 | 1.2 | 1.1; 1.3 | 55.2 | 53.5; 56.9 | 1.1 | 1.1; 1.2 | 49.2 | 47.2; 51.2 | 1.0 | |
| Physically inactive | 17.8 | 16.4; 19.1 | 0.8 | 0.7; 0.9 | 13.4 | 12.1; 14.6 | 0.8 | 0.7; 0.9 | 16.3 | 14.8; 17.7 | 1.0 | |
| Watch TV for three or more hours a day | 32.1 | 30.2; 34.0 | 1.4 | 1.3; 1.6 | 31.0 | 29.4; 32.6 | 1.4 | 1.3; 1.5 | 22.2 | 20.6; 23.8 | 1.0 | |
| Body mass index (BMI) ^e | | | | | | | | | | | | |
| Overweight | 58.3 | 56.4; 60.3 | 1.3 | 1.3; 1.4 | 44.5 | 42.8; 46.2 | 1.2 | 1.1; 1.3 | 36.6 | 34.7; 38.5 | 1.0 | |
| Obesity | 24.4 | 22.7; 26.0 | 1.7 | 1.4; 1.9 | 15.1 | 13.9; 16.2 | 1.3 | 1.1; 1.4 | 11.8 | 10.4; 13.1 | 1.0 | |
| Self-rated health | | | | | | | | | | | | |
| Health status considered poor | 9.6 | 8.5; 10.8 | 3.4 | 2.6; 4.5 | 4.5 | 3.8; 5.2 | 1.8 | 1.4; 2.4 | 2.4 | 1.9; 3.0 | 1.0 | |
| Reported morbidity | | | | | | | | | | | | |
| Hypertension | 44.0 | 42.1; 45.9 | 1.8 | 1.6; 2.0 | 18.8 | 17.6; 20.0 | 1.4 | 1.2; 1.5 | 13.0 | 11.8; 14.2 | 1.0 | |
| Diabetes | 13.3 | 12.1; 14.5 | 2.2 | 1.8; 2.7 | 4.5 | 3.9; 5.1 | 1.5 | 1.2; 1.9 | 2.7 | 2.2; 3.2 | 1.0 | |
| Dyslipidemia | 31.4 | 29.6; 33.1 | 1.0 | 0.9; 1.1 | 18.0 | 16.8; 19.2 | 0.9 | 0.8; 1.0 | 18.4 | 17.0; 19.8 | 1.0 | |
| Early cancer detection exams | | | | | | | | | | | | |
| Mammography once in lifetime | 86.4 | 84.4; 88.4 | 0.9 | 0.9; 0.9 | 92.6 | 91.1; 94.1 | 1.0 | 1.0; 1.0 | 95.3 | 93.8; 96.8 | 1.0 | |
| Mammography in the last two years | 72.9 | 70.3; 75.4 | 0.8 | 0.8; 0.9 | 81.4 | 79.0; 83.9 | 0.9 | 0.9; 1.0 | 88.3 | 85.9; 90.6 | 1.0 | |
| Pap smear once in lifetime | 86.7 | 85.3; 88.2 | 0.9 | 0.9; 0.9 | 87.9 | 86.7; 89.0 | 1.0 | 0.9; 1.0 | 90.2 | 88.9; 91.6 | 1.0 | |
| Pap smear in the last three years | 78.6 | 76.6; 80.6 | 0.9 | 0.8; 0.9 | 83.6 | 82.2; 84.9 | 1.0 | 0.9; 1.0 | 87.2 | 85.7; 88.7 | 1.0 | |

a) Surveillance System of Risk and Protective Factors for Chronic Diseases by Telephone Survey (Vigitel)/SVS/MS

b) Category of reference

c) 95%CI: 95% confidence interval

d) PR: prevalence ratio, adjusted by age.

e) Data imputation

20.2%) consume confectionery regularly. In addition, 16% (95%CI: 15.3%; 16.6%) consider their salt intake high or very high; and 15.5% (95%CI: 15.8%; 17.1%) replace lunch or dinner with a snack for seven or more times a week (Table 1). The prevalences of regular beans intake, excessively fatty meat and whole milk, high salt intake and regular soft drinks intake were higher in men. Among women, a higher prevalence was noticed for the regular and recommended consumption of fruit and vegetables, regular consumption of confectionery and replacement of lunch or dinner with a snack (Table 1). The prevalence of excessively fatty meat intake, high salt intake, regular soft drinks and confectionery intake is higher in younger age groups (Table 2). Individuals with less schooling reported a higher prevalence of excessively fatty meat intake, regular intake of soft drinks and beans and a lower frequency of fruit and vegetable intake compared to those with more schooling (Tables 3 and 4).

For the physical activity indicators, 33.8% (95%CI: 33%; 34.6%) practice the recommended level of free time physical activity and 16.2% (95%CI: 15.6%; 16.9%) were considered physically inactive. In relation to the new indicator added in 2013 (for international comparability and monitoring of the 2011-2022 Strategic Action Plan to Tackle Non-communicable Diseases (NCDs)), about half of the adults – 49.4% (95%CI: 48.5%; 50.2%) – reported insufficient practice of physical activity. Only 12.1% (95%CI: 11.5%; 12.7%) were considered active when commuting to work/school and a high percentage of adults – 28.6% (95%CI: 27.8%; 29.4%) – watched TV for three or more hours a day (Table 1). Higher prevalences of free time physical activity – although also for physical inactivity – were noticed in men (Table 1). Practice of free time physical activity was more frequent in men and women who have studied for 12 years or more; an inverted relation was noticed for the habit of watching TV for three or more hours a day and for physical activity when commuting to work/school (Tables 3 and 4). The recommended practice of free time physical activity and when commuting to work/school reduces as people get older (Table 2).

About half of the population (50.8%) reported overweight (95%CI: 49.9%; 51.6%) and 17.5% were considered obese (95%CI: 16.9%; 18.2%), which is a finding of concern. A higher overweight prevalence was found in men compared to women, although a

difference between the sexes was not noticed in obesity prevalence (Table 1). Higher overweight and obesity prevalences were found in the population aged between 45 and 64 (Table 2). Overweight is higher in less educated women; however, a significant difference in men concerning schooling was not noticed (Tables 3 and 4).

The prevalence of poor self-rated health was 4.9% (95%CI: 4.5%; 5.3%). The prevalence of reported hypertension was 24.1% (95%CI: 23.4%; 24.8%) and reported diabetes was 6.9% (95%CI: 6.5%; 7.3%). The presence of NCDs increased with age, and is more frequent in individuals older than 65 years (Table 2). Women reported the worst self-rated health condition and a higher frequency of dyslipidemia (Table 1). In both sexes, a higher frequency of hypertension and diabetes was noticed, as well as a worse evaluation of health condition from less educated individuals (Tables 3 and 4).

A high percentage of women have already been submitted to a mammography exam, as well as to a Pap smear exam. Undergoing a mammography exam at some time in life was reported by 89.7% (95%CI: 88.5%; 90.9%) of those aged 50 to 69, while 78% (95%CI: 76.4%; 79.6%) reported undergoing the exam in the last two years. In the same way, 88.1% (95%CI: 87.4%; 88.9%) of women aged 25 to 64 reported undergoing the Pap smear exam at some time in their life and 82.9% (95%CI: 81.9%; 83.8%) in the last three years (Table 1). The frequency of these exams was lower among less educated women (Table 4).

Discussion

Generally speaking, risk factors were associated with older age, less schooling and the male sex. Among the risk factors, a lower prevalence was noticed in smoking (11.3%), followed by alcohol abuse and physical inactivity (around 16%). One in every two adults reported being overweight, with a high prevalence of inadequate eating habits, such as high salt intake, replacement of lunch or dinner with a snack and regular confectionery intake in nearly one fifth of the respondents. However, less than one fourth of the respondents reported the recommended fruit and vegetables intake.

Studies for monitoring NCDs risk factors have become important in the development, support and evaluation of health promotion policies against these diseases.¹⁰

In the present study, the publishing of data obtained by Vigitel 2013 – eighth year of operation of a system updated yearly, with data about the population behavior regarding chronic diseases – makes this survey one of the main sources of information on this topic in Brazil.

Smoking prevalence in 2013 was lower than that observed in all the previous editions of the study.¹¹⁻¹³ When comparing this prevalence to that published by the Global Adult Tobacco Survey (GATS) – conducted from an observation of 16 countries, gathering a population of nearly 3 billion people – Brazil shows the lowest smoking prevalence.¹⁴

According to the 2013 Report on Tobacco Control for the Americas, the highest smoking frequencies are found in Chile (40.6%), Bolivia (26.6%), Ecuador (22.7%) and Argentina (21.9%).¹⁵ Brazil reduced the smoking prevalence by around 50%, between 1989 and 2010, a period in which investment in policies for tobacco control caused a significant impact in the reduction of early mortality from smoking.^{13,16} In 2014, a Presidential Decree prohibited the use of cigarette, cigarillo, cigars, pipes, hookahs or other smoking products in closed places, regardless of being derived from tobacco or not; and prohibited cigarette advertising, except at points of sale, in addition to expanding health messages and warnings on cigarette packages.¹⁷

With regard to alcoholic beverage intake, 16% of the adults interviewed reported alcohol abuse and 5% reported driving motor vehicle after alcoholic drinks intake, this habit being more frequent among young and more educated men. It is important to highlight that these prevalences may be underestimated, whether in function of being a behavior known by the general population as inadequate, or by its legal implications. In 2012, more than 3.3 million people died due to alcohol intake, which corresponds to 6% of all deaths in the planet. According to WHO's 2010 global report,¹⁸ Brazil was the fifth country in Latin America which most consumed alcohol: 8.7 liters of neat alcohol a year. It came after Chile, which led the ranking in the region with 9.6 liters, Argentina (9.3 liters), Venezuela (8.9) and Paraguay (8.8). It is important to highlight the relevance of the Health Sector in reverting this scenario in Brazil, when it supported the implementation of the Provisory Presidential Decree No. 415, dated 21 January, 2008,¹⁹ a Federal Government initiative that prohibits the commerce of alcoholic drinks on federal highways, as

well as the implementation of Law No.11,705, dated 19 June, 2008²⁰ (known as “Lei Seca”) and the approval of Law No.12,760, dated 20 December, 2012, that increases the fine value in addition to authorizing the use of videos, witnesses or other means as ways of proving the driver's intoxication in the criminal process.²¹

More than half of the Brazilian population reported being overweight, most frequently men. Despite the increased trend observed between 2006 and 2011,²² stabilization in overweight and obesity prevalences was noticed for the first time in 2013, when compared to values estimated in 2012. Studies show that in the last decades, Central and South America have been increasing the BMI in 1.3 and 1.4 units, respectively.²³ Mexico and Chile are the countries that showed the highest overweight prevalences in Latin America: 71.3% in Mexico and 64.5% in Chile.^{24,25}

Concerning fruit and vegetables intake, more than one third of Brazilians reported regular intake and around one fifth reported consuming it in the recommended amount and frequency (5 portions a day, or 400 g of fruit), and this habit is more frequent among women and individuals older than 65. Compared to the rest of the world, Latin-American countries have a low prevalence of fruit and vegetables intake/day at the recommended levels, so Brazil is not an exception.²³

Vigitel 2013 has included questions about replacing meals with snacks and confectionery and salt intake. The high frequency of the first item reinforces the importance of actions for promotion of healthy diets developed in Brazil, with a focus on the consumption of food *in natura* and reduction of ultra-processed food intake. Amid the several actions against obesity in different age groups, it is important to highlight the publishing of the *Dietary Guidelines for the Brazilian Population*, as well as the actions conducted in partnership with the *School Meal Program*, especially regarding the purchase of fresh food from Family Agriculture, and the encouragement of breastfeeding.²⁶ In the same way, awareness-raising actions with the population and care with salt intake at recommended levels have also been conducted in Brazil.¹⁰ Among these, one relevant action is the partnership of the Ministry of Health with the productive sector (Industry and Commerce), which focused on establishing national goals for the reduction of sodium levels in processed food in Brazil.^{10,27} However, the data were self-referred

and may be subject to difficulties individuals may have in perceiving their amount of sodium intake .

In relation to physical activity indicators, one third of the respondents reported practicing free time physical activity, with higher frequency among men. Concerning one of the indicators incorporated into *Vigitel* 2013 – insufficient physical activity –, about half of the population interviewed is in this situation. Comparative studies conducted on a global level, in 2012, point to the prevalence of 43.2% of insufficient physical activity in individuals aged 15 or more: In Latin America, the prevalence of physical inactivity in all age groups varied from 40 to 68%, putting Brazil among the countries with higher frequencies of physical activity practice, in the same year. Similar results were found in Argentina and Colombia, countries where men are equally prone to reporting a higher frequency of physical inactivity.²⁸ In Brazil, big efforts have been made in the promotion of physical activity, headed by the “Health Gym” Program, the main goal of which is to build physical spaces aimed at the development of actions for physical activity, leisure and promotion of healthy lifestyles with the community, under the guidance of health professionals.^{10,29}

With regard to morbidities, hypertension was reported by one fifth of the population, while one fourth reported having dyslipidemia, and 7%, diabetes. An increase of diabetes has been noticed in all the regions in the world, due to the increase of life expectancy, in addition to the progressive influence of non-healthy lifestyles, which includes physical inactivity and inadequate eating habits, besides the high frequency of overweight and obesity.^{1,3-7} Women reported a higher prevalence of these chronic diseases when compared to men, possibly due to the fact that they seek health services more frequently than men, and thus, have a higher chance of diagnosis.²

A high coverage of mammography (88.1%) and of Pap smear exams (89.7%) were noticed in women living in the Brazilian state capital cities and the Federal District. These coverage is higher among more educated women who live in capital cities of the Central-Southern region of the country, which proves the need for promoting these exams among the population with less social economic power as well as in the Northern and Northeastern regions.³⁰ High coverage of these exams can favor early detection and thus increase life expectancy

of women affected by these types of cancer.

Some limitations were found for the development of this study, especially in the restriction of representativeness of the sample to individuals living in the states and Federal District capital cities, as well as to those with access to landline telephones. Aiming at minimizing this limitation, which derives from the differences between demographic aspects of the *Vigitel*'s sample and those of the general population, data weighting factors were applied to estimate prevalences through post-stratification.

Additionally, *Vigitel* is subject to biased information, especially in the respondent's measurement of food and alcohol intake. The prevalence of salt intake might also have been underestimated, given that it is a self-perception of daily consumption. The morbidity indicators were based on reports of previous medical diagnosis. The reported data, however, could refer to false positive exams, which can cause the overestimation of corresponding prevalences. Aiming at minimizing biased information by *Vigitel*, new questions are validated before beginning the interviews, each year.

The Surveillance System of Risk and Protective Factors for Chronic Diseases by Telephone Survey (*Vigitel*) is proving to be useful in the monitoring of NCD risk factors, including the monitoring of the 2011-2022 Strategic Action Plan to Tackle Non-communicable Diseases (NCDs) goals, and has become an important support tool for the planning and management of health in Brazil. Investment in public policies that reduce risk factors for chronic diseases can have a positive impact on the reduction of morbidity and mortality and on improving the Brazilian population's quality of life.

Authors' Contributions

Malta DC, Campos MO, Oliveira MM, Iser BPM, Bernal RTI, Claro RM, Monteiro CA, Silva Jr JB and Reis AAC participated in the study conception, analysis and interpretation of data, drafting, editing and the final approval of the manuscript, and are responsible for all the other aspects of the article, including the assurance of its accuracy and integrity.

The *Vigitel* group took part in the conception and analysis of the 2013 Surveillance System of Risk and Protective Factors for Chronic Diseases by Telephone Survey (*Vigitel*)

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