

Trends in smoking among the adult population in Brazilian capitals: a data analysis of telephone surveys from 2006 to 2009

Tendências do tabagismo na população adulta das capitais brasileiras: uma análise dos dados de inquéritos telefônicos de 2006 a 2009

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Abstract

The objective of this study was to analyze the trend of tobacco use and smoking cessation, and the intensity of cigarettes per day from 2006 to 2009 in the Brazilian state capitals. Data were analyzed for 18-year-old individuals or older who were interviewed by the Telephone-based Surveillance of Risk and Protective Factors for Chronic Diseases (VIGITEL), which was performed in the Brazilian State capitals and the Federal District in 2006, 2007, 2008, and 2009. For each year and large areas, age-adjusted prevalence and prevalence according to age groups (18 to 29, 30 to 59 and 60 and older) stratified by sex were calculated. Smoking cessation index was assessed and, for current smokers, the proportion of those who reported smoking 20 or more cigarettes a day was estimated according to gender and age group (18 to 39 and 40 and over). The results show a slight tendency to the reduction of tobacco use among men and stability for women, except for residents from the North and Northeast Regions. In general, the greatest prevalence among men is in younger groups; while amongst women, it is in the intermediary age group (30 to 59 years old). Smoking cessation seems to be slightly higher among men; there is a strong reverse relation between tobacco use and schooling. The proportion of 20 or more cigarettes per day is higher among older people and varies in Brazilian Regions. Results point out the need to prioritize strategies for tobacco control that can reach young individuals and women at low-education level.

Keywords: smoking; telephone interview; educational status; health surveys; tobacco cessation; daily cigarette consumption; Brazil.

O objetivo deste estudo foi analisar a tendência do tabagismo, da cessação e da intensidade de cigarros diários, entre 2006 a 2009, nas capitais brasileiras. Foram analisados os dados de indivíduos com 18 anos e mais, entrevistados pelo Sistema de Vigilância e Fatores de Risco e Proteção para Doenças Crônicas por Inquérito Telefônico (VIGITEL), realizado nas capitais brasileiras e Distrito Federal em 2006, 2007, 2008 e 2009. Para cada ano e grandes regiões, foram calculadas as prevalências de tabagismo ajustadas por idade e por grupos etários (18 a 29, 30 a 59 e 60 ou mais anos) estratificados por sexo. Foi calculado ainda o índice de cessação do tabagismo e, para os fumantes atuais, estimou-se a proporção dos que referem fumar 20 ou mais cigarros segundo sexo e grupo etário (18 a 39 e 40 anos e mais). Os resultados mostram leve tendência à queda do tabagismo entre homens e estabilidade para mulheres, com exceção daquelas residentes nas regiões Norte e Nordeste. Em geral, as maiores prevalências entre homens aparecem nos grupos mais jovens; enquanto que, entre as mulheres, são entre as de idade intermediária (30 a 59 anos). A cessação sugere estar ligeiramente aumentando entre os homens; há forte relação inversa entre a prevalência de tabagismo e anos de escolaridade, e a proporção de fumantes de 20 ou mais cigarros diários é maior entre os mais idosos e apresenta padrão diferenciado entre as regiões brasileiras. Os resultados indicam a necessidade da priorização de estratégias de controle do tabagismo que alcancem jovens e mulheres de baixa escolaridade.

Palavras-chave: tabagismo; entrevista por telefone; escolaridade; inquéritos de saúde; cessação de tabagismo; consumo diário de cigarro; Brasil.

Estimates from the World Health Organization (WHO) show that Chronic Non-Communicable Diseases (CNCDs) are responsible for more than 60% of all deaths reported in the world, or about 35 million deaths in 2005¹. According to WHO, a small group of risk factors responds for most deaths caused by CNCDs and for the substantial fraction of disease load due to these disorders. Among these factors, smoking, alcohol, obesity, inadequate eating habits and physical inactivity were observed^{1,2}.

Tobacco is the leading preventable cause of death and, according to WHO, around 5.4 million people die every year due to lung cancer, cardiovascular and other diseases³.

The adverse effects of smoking have been demonstrated for decades. The first studies to confirm the association between smoking and cancer were Doll's and Hill's, in the 1950s⁴.

Literature points out that the reduction of daily tobacco use decreases the risk of cardiovascular problems, respiratory symptoms and cancer incidence, especially in the lung⁵.

A great effort has been made by many countries, especially the developed ones, in order to control smoking, which has led to an important decrease in the prevalence of smokers in the past decades. Many countries have shown this decline in the past few years, such as: Japan, United States and United Kingdom⁶.

In Brazil, according to the National Health and Nutrition Survey, smoking prevalence among adults older than 18 years was 34.8% (1989), and decreased to 22.4% (2003), according to the World Health Survey. These data show a decline of 35% (or 2.5% a year) in individuals aged 18 years or more from 1989 to 2003⁶. This important reduction was the result of preventive and control actions due to educational, preventive and regulatory measures⁷.

Smoking control in Brazil started in 1980 and the main strategies were: legal and educational measures and tobacco products regulation⁸.

In 2006, the Brazilian government ratified the Framework Convention on Tobacco Control (FCTB), by WHO. Among the measures adopted by the country, monitoring and surveillance of smoking prevalence are included⁹.

With the objective to monitor smoking and other protective and risk factors for chronic diseases, the Telephone-based Surveillance of Risk and Protective Factors for Chronic Diseases (VIGITEL) was introduced in the 26 Brazilian capitals and the Federal District. Among the monitored indicators, there is information on smoking, reported morbidity, physical activity pattern, eating habits etc.¹⁰. These data are essential to guide public policies of health promotion and CNCD prevention.

The analysis of VIGITEL results about smoking in 2006 confirmed the highest concentration of smokers among those with lower education level, and also showed that the prevalence of intensive smoking was higher among this population in both genders, except for men in the South region¹¹.

In order to better understand the evolution of the smoking epidemiology in Brazil and to provide resources for control policies, this study aims at analyzing the trend in smoking per age group and schooling, smoking cessation index and daily use of cigarettes among smokers from 2006 to 2009 in the Brazilian capitals.

Methods

A trend analysis of smoking and non-smoking prevalence was conducted based on VIGITEL data from 2006 to 2009, as well as lifetime cigarette consumption among smokers. VIGITEL was established in 2006 by the Ministry of Health and, since then, it has provided annual data to represent the adult population (≥ 18 years)

living in the 26 Brazilian capitals and the Federal District who have a telephone line. Annually, about 2,000 telephone surveys were performed in each of the 27 federal states, gathering a total of 54,000 individuals assessed per year¹⁰.

Probability samples of the population aged 18 years or more living in households with at least one telephone line were obtained in two phases: systematic draw of 5,000 telephone lines in each city, followed by another draw and 25 replicates (subsamples) of 200 lines; draw of an adult resident to answer the survey¹⁰.

Protective and risk factor estimates were measured considering the differences in the sociodemographic composition of the VIGITEL sample in relation to the features of the total adult population in each city, according to Census 2000. More details about the sample design and methodological procedures are published¹².

The questionnaire applied at VIGITEL considered different models used by monitoring systems of risk factors for chronic diseases¹³. The questionnaire is comprised of questions about the following subjects: demographic and socioeconomic characteristics, eating habits and physical activities associated with CNCD occurrence; weight and height; frequency of cigarette and alcohol use; self-reported health status and reference to previous medical diagnosis of hypertension, diabetes and high cholesterol¹⁰.

Individuals who reported "currently smoking" were considered smokers, regardless of the frequency and intensity. So the sum of daily smokers and the occasional ones (those who declare smoking less than one cigarette a day) was done. Ex-smokers were classified as those who reported smoking at some point in life at least for one month on a daily basis or occasionally for three months.

To estimate the prevalence of current and ex-smokers, the proportion of smokers and its respective 95% confidence intervals (95%CI) were calculated. Age-adjusted

annual prevalence of smokers was calculated (18 to 24, 25 to 34, 35 to 44, 45 to 54, 55 to 64, and 65 years or older) according to gender in the capitals of Brazil, dividing the regions from 2006 to 2009. Also, the prevalence for three different age groups was calculated: 18 to 29, 30 to 59, and 60 years or older, according to gender, with data from the capitals of Brazil and its regions.

Afterwards, cessation index was estimated based on the proportion of ex-smokers divided by the sum of current smokers and ex-smokers, also adjusted by age, according to gender in Brazil and regions for each year of analysis.

In order to better understand the effect of each year of schooling on smoking, graphics were designed with age-adjusted prevalence and respective 95%CI per school year, divided by gender for the capitals, regarding the whole country and its regions from 2006 to 2009.

For those who declared being current smokers, the age-adjusted proportion was calculated regarding those who reported smoking 20 or more cigarettes a day. The answer to the question at VIGITEL was considered: "How many cigarettes do you smoke in one day"? The information from Brazilian capitals by regions according to gender was analyzed.

For data processing and statistical analysis, the application "STATA", version 9¹⁴ was used. The commands for proportions were applied, considering weighing factors for each individual who participated in VIGITEL.

This study was approved by the National Committee for Ethics in Research involving human beings (CONEP). Informed consent form was replaced by a verbal consent obtained during telephone contact with the participants.

Results

Table 1 presents the age-adjusted prevalence of current smokers for all the Brazilian capitals and regions. A slight

decreasing trend among men is noted from 2006 to 2009, when data include all the capitals. The decrease in smoking prevalence was well established among men in the North region, from 21.2%, in 2006, to 17.6%, in 2009, which represents a 17% decrease. In other regions, although estimates from 2009 were slightly inferior to those of 2006, the confidence intervals for these two years were overlapped.

Even if women have lower rates when compared to men, the profile of all capitals is stable, which demonstrates a heterogeneous variation among regions. Meanwhile, there was an increasing trend in the capitals of the Southeast and South regions; however, this did not affect the statistics, because the capitals of the North and Northeast regions presented a decreasing trend; the Center West region was stable. The strongest decrease (up to 26%) was observed among women in the North region, where the prevalence was 11.7% in 2006, and 8.7% in 2009.

Concerning the analysis by age group (Table 2), it is important to mention that, among men, the highest percentages, regardless being for all Brazilian capitals or by capitals of each region, were seen among the youngest age group (18 to 29 years old). Among women, the highest prevalence observed was in the intermediate age group (30 to 59 years) for added data regarding Brazil and for those distributed by capitals of regions; this effect is visible in the North region, where the difference between the intermediate age group was almost twice as high as the young one (11.4 versus 6.0%).

The trend observed in the four analyzed years was slightly lower among men aged 18 to 39 years, and stable for those aged from 30 to 59 years and 60 years or older, except for the North region, which presented a decrease in all age groups. Those aged from 30 to 59 years in the Northeast and Center West regions also presented a decreasing trend (Table 2).

Among women, the prevalence of smokers was stable in the three studied age

Table 1. Age-adjusted prevalence of current smokers in Brazilian capitals by great region, according to gender, from 2006 to 2009

Tabela 1. Prevalência de fumantes atuais ajustada por idade nas capitais brasileiras por grandes regiões, segundo sexo, 2006 a 2009

		Male							
		2006		2007		2008		2009	
		Prev	95%CI	Prev	95%CI	Prev	95%CI	Prev	95%CI
Male	Brazil	19.7	(18.9–20.5)	20.3	(18.9–21.6)	19.7	(18.0–21.5)	18.4	(16.9–19.8)
	North	21.2	(19.6–22.8)	19.7	(17.7–21.8)	17.9	(15.9–19.8)	17.6	(15.4–19.8)
	Northeast	17.7	(16.4–19.0)	17.4	(15.8–18.9)	14.7	(13.3–16.1)	17.0	(15.3–18.7)
	Southeast	19.7	(17.8–21.6)	21.9	(19.3–24.5)	23.2	(19.8–26.7)	18.6	(15.6–21.6)
	South	22.1	(19.6–24.5)	20.8	(18.3–23.2)	21.2	(18.8–23.6)	21.8	(19.5–24.1)
	Midwest	19.2	(17.1–21.4)	20.2	(17.7–22.6)	17.4	(15.3–19.6)	18.2	(14.5–21.8)
Female	Brazil	11.7	(11.3–12.2)	12.4	(11.5–13.2)	12.4	(11.5–13.2)	12.4	(11.4–13.4)
	North	11.7	(10.6–12.8)	10.5	(9.2–11.9)	8.6	(7.4–9.9)	8.7	(7.5–9.8)
	Northeast	10.3	(9.5–11.1)	9.6	(8.6–10.5)	8.4	(7.6–9.2)	9.0	(8.0–10.0)
	Southeast	12.7	(11.6–13.9)	14.2	(12.4–15.9)	14.9	(13.2–16.6)	14.4	(12.3–16.5)
	South	15.5	(14.0–17.0)	17.0	(15.2–18.8)	15.6	(13.7–17.4)	18.0	(16.1–19.9)
	Midwest	11.5	(10.2–12.8)	9.9	(8.7–11.1)	12.3	(10.6–14.1)	11.2	(9.3–13.2)

groups, except for the North region, which tended to decrease in all age groups, as well as the elderly women in Northeast, South and Center West regions. It is important to analyze the percentage increase of female smokers in the youngest age group in the South region (Table 2).

Table 3 presents the cessation index for the total of capitals and separated by regions, according to gender. In the studied years, this percentage was slightly positive among men (+3%), but negative among women (-5.5%) for the total of capitals. The highest increase was observed among men from the North region (+11.7%). As opposed to the total trend for women, the north Region presented a significantly statistic increase in cessation (+6.3%) and, to a lesser extent, Northeast and Center West regions had a slight increasing trend as to women who reported to have stopped smoking.

Figure 1 presents the smoking prevalence range according to years of schooling. Smoking prevalence ranges as to each school year, and, usually, the more school years, the lower the smoking rate. This is observed in all analyzed years, both for men and women. However, there seems to

be an increasing trend related to four/five school years, which would correspond to Elementary School, and then it decreases again. This effect repeats itself in all regions of Brazil, and is quite relevant in the Southeast, South and Center West regions, for men and women (data not presented).

The proportion of smokers who reported smoking 20 or more cigarettes a day does not reach 30% among men and women aged between 18 and 39 years in Brazilian capitals (Figure 2). Among people aged 40 years or more, this proportion is around 40% among men who participated in the surveys from 2006 to 2009, and ranges from 30 to 41% among women. It is clear that such proportions are higher in the South region, especially among people aged 40 years or more, surpassing 60% in some years of the studied period.

Among the youngest (18 to 39 years), there is an increasing trend among people who smoke 20 or more cigarettes a day in the capitals of the Southeast region, both for men and women. In other regions, the intensity pattern of 20 or more cigarettes a day is not typical, except for women in the South region, who clearly present a linear and continuous decreasing trend.

Table 2. Prevalence of current smokers in Brazilian capitals by great region, according to gender and age groups (from 18 to 29, from 30 to 59 and 60 and over), from 2006 to 2009

Tabela 2. Prevalência de fumantes atuais nas capitais brasileiras por grandes regiões, segundo sexo e grupos etários (18 a 29, 30 a 59 e 60 e mais), de 2006 a 2009

Gender	Region	Age group	2006	2007	2008	2009
Male	Brazil	18-29	21.0 (19.2–22.8)	22.8 (19.7–25.9)	22.3 (16.8–27.7)	19.7 (15.5–23.8)
		30-59	21.6 (20.6–22.7)	21.9 (20.2–23.6)	20.6 (18.9–22.3)	19.4 (17.7–21.2)
		60+	14.5 (13.0–16.1)	13.9 (11.2–16.5)	14.5 (11.8–17.1)	14.8 (12.0–17.5)
	North	18-29	24.7 (21.3–28.1)	24.2 (19.8–28.5)	22.0 (17.1–26.8)	20.4 (15.1–25.7)
		30-59	22.6 (20.4–24.8)	21.1 (18.4–23.9)	21.4 (18.5–24.4)	17.9 (14.7–21.0)
		60+	15.9 (12.4–19.4)	15.9 (10.7–21.2)	7.8 (4.9–10.8)	13.4 (9.2–17.6)
	Northeast	18-29	17.9 (15.0–20.8)	18.7 (14.8–22.6)	12.5 (9.5–15.4)	21.2 (16.9–25.6)
		30-59	19.9 (18.1–21.7)	19.7 (17.5–21.9)	17.5 (15.3–19.8)	16.8 (14.3–19.4)
		60+	13.1 (10.5–15.6)	10.8 (8.3–13.4)	11.5 (8.9–14.1)	13.1 (9.8–16.5)
	Southeast	18-29	19.3 (14.6–24.0)	24.4 (17.9–31.0)	30.2 (18.6–41.8)	17.2 (8.2–26.3)
		30-59	21.7 (19.3–24.0)	23.6 (20.3–26.8)	22.5 (19.3–25.8)	20.7 (17.5–24.0)
		60+	15.3 (11.7–19.0)	14.6 (9.9–19.3)	15.7 (11.0–20.4)	15.8 (11.1–20.6)
	South	18-29	22.8 (16.5–29.2)	23.7 (17.6–29.8)	21.6 (15.9–27.2)	20.4 (15.1–25.7)
		30-59	25.8 (22.8–28.8)	22.0 (19.1–24.9)	21.6 (18.6–24.5)	25.7 (22.4–29.1)
		60+	13.7 (9.6–17.9)	16.2 (11.4–21.1)	19.6 (14.2–25.0)	14.6 (10.4–18.7)
	Midwest	18-29	20.8 (15.9–25.7)	24.8 (18.3–31.3)	18.8 (13.0–24.5)	23.5 (14.4–32.6)
		30-59	20.3 (17.4–23.2)	20.5 (17.7–23.3)	18.1 (15.5–20.7)	16.8 (12.4–21.2)
		60+	15.6 (11.2–20.0)	13.3 (9.1–17.4)	15.5 (11.2–19.9)	14.1 (6.1–22.1)
Female	Brazil	18-29	10.1 (8.9–11.2)	10.4 (8.2–12.5)	10.4 (8.4–12.4)	11.7 (8.9–14.4)
		30-59	14.2 (13.5–14.8)	15.3 (14.3–16.4)	14.7 (13.6–15.8)	14.4 (13.1–15.7)
		60+	7.8 (7.0–8.7)	6.5 (5.3–7.8)	8.1 (6.7–9.6)	7.4 (6.3–8.6)
	North	18-29	9.0 (6.6–11.4)	9.3 (6.3–12.3)	7.2 (4.2–10.2)	6.0 (3.6–8.5)
		30-59	13.6 (12.2–15.1)	11.2 (9.7–12.8)	10.5 (8.7–12.4)	11.4 (9.5–13.3)
		60+	9.4 (7.2–11.6)	8.3 (5.5–11.2)	6.1 (3.9–8.3)	5.6 (3.8–7.5)
	Northeast	18-29	9.2 (7.2–11.3)	7.8 (5.4–10.3)	5.5 (3.8–7.2)	8.1 (5.3–11.0)
		30-59	12.3 (11.2–13.4)	11.5 (10.2–12.8)	9.2 (8.1–10.3)	9.7 (8.4–11.1)
		60+	6.2 (4.9–7.4)	6.0 (4.6–7.4)	7.9 (6.3–9.6)	7.3 (5.7–8.8)
	Southeast	18-29	12.0 (9.4–14.7)	12.2 (7.5–17.0)	12.8 (8.6–17.1)	14.7 (8.7–20.7)
		30-59	15.4 (13.8–17.0)	18.0 (15.9–20.1)	18.2 (16.0–20.4)	16.7 (14.1–19.3)
		60+	7.9 (5.9–9.8)	6.0 (3.9–8.2)	8.9 (6.4–11.4)	7.3 (5.4–9.3)
	South	18-29	12.3 (9.2–15.4)	18.4 (13.9–22.8)	14.6 (9.6–19.6)	19.3 (14.1–24.5)
		30-59	20.0 (17.7–22.2)	19.9 (17.3–22.4)	20.1 (17.6–22.6)	21.7 (19.0–24.5)
		60+	10.1 (7.8–12.5)	9.3 (6.7–11.9)	5.8 (3.9–7.8)	8.8 (6.3–11.3)
	Midwest	18-29	11.0 (7.6–14.3)	5.9 (3.7–8.2)	14.8 (9.3–20.3)	11.3 (6.0–16.5)
		30-59	13.5 (11.7–15.3)	13.3 (11.4–15.3)	13.1 (11.3–15.0)	12.7 (10.1–15.4)
		60+	7.8 (5.6–10.1)	6.8 (4.7–8.9)	8.0 (5.8–10.2)	8.5 (5.3–11.7)

Table 3. Age-adjusted smoking cessation index in Brazilian capitals by great region, according to gender, from 2006 to 2009
Tabela 3. Índice de cessação ajustado por idade de tabagismo nas capitais brasileiras por grandes regiões, segundo sexo, 2006 a 2009

		Male							
		2006		2007		2008		2009	
		Prev	95%CI	Prev	95%CI	Prev	95%CI	Prev	95%CI
Male	Brazil	59.3	(58.0–60.6)	57.6	(55.5–59.7)	57.8	(55.3–60.3)	61.1	(57.1–65.1)
	North	60.0	(57.6–62.4)	62.0	(58.7–65.3)	64.4	(61.2–67.6)	67.0	(63.3–70.7)
	Northeast	60.5	(58.1–62.9)	60.0	(56.9–63.1)	64.7	(61.6–67.8)	60.2	(57.0–63.4)
	Southeast	59.2	(55.8–62.6)	55.0	(51.0–59.0)	52.9	(48.9–56.9)	61.3	(53.6–69.1)
	Sul	55.6	(51.9–59.3)	57.3	(53.1–61.5)	57.4	(53.1–61.6)	58.1	(53.5–62.6)
	Midwest	59.1	(55.2–62.9)	59.2	(55.4–63.1)	61.0	(57.1–64.9)	59.1	(53.8–64.5)
Female	Brazil	63.8	(62.3–65.2)	62.1	(59.8–64.4)	61.4	(59.0–63.8)	60.3	(57.7–62.9)
	North	68.6	(65.8–71.4)	68.6	(64.9–72.4)	72.2	(68.4–75.9)	72.9	(69.2–76.7)
	Northeast	65.8	(63.2–68.4)	67.7	(64.3–71.0)	71.6	(68.4–74.7)	66.6	(62.7–70.4)
	Southeast	58.7	(55.4–62.0)	58.2	(54.1–62.3)	54.4	(50.0–58.8)	55.2	(50.8–59.6)
	Sul	56.3	(52.7–59.9)	54.3	(50.3–58.3)	59.2	(54.9–63.6)	53.3	(49.1–57.5)
	Midwest	61.4	(57.7–65.2)	67.7	(63.6–71.9)	62.3	(57.8–66.8)	64.1	(58.7–69.4)

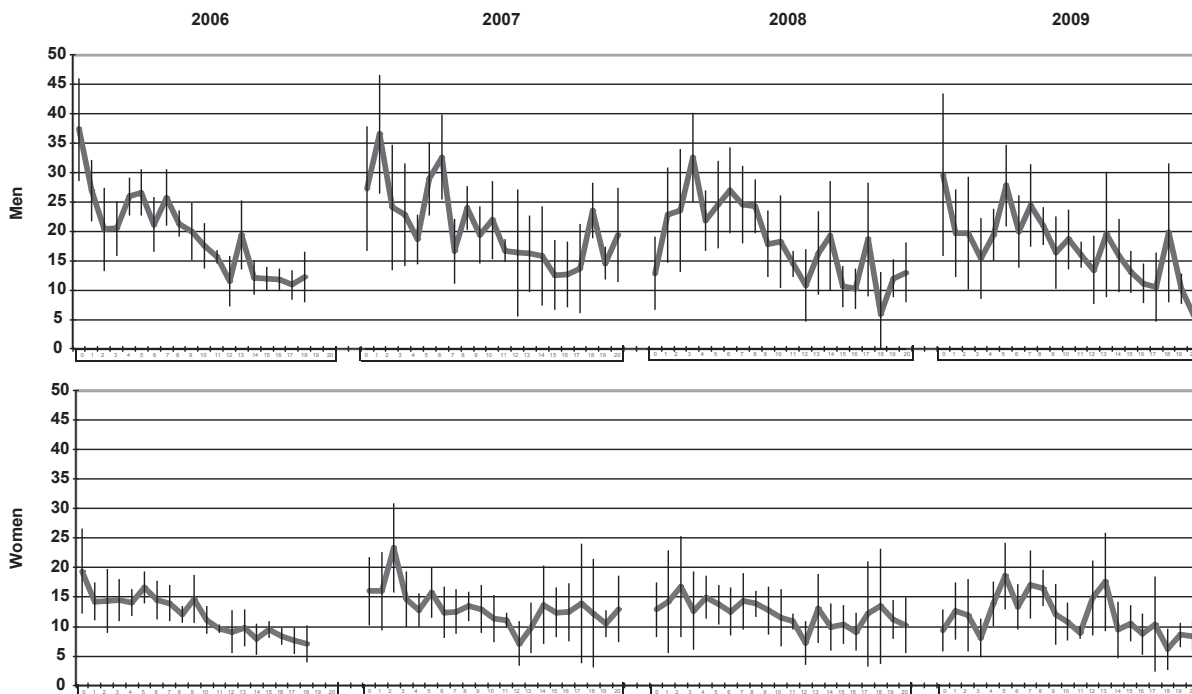


Figure 1. Prevalence of current smokers by years of schooling in Brazilian capitals, according to gender, from 2006 to 2009
Figura 1. Prevalência de fumantes atuais por anos de escolaridade nas capitais brasileiras, segundo sexo, 2006 a 2009

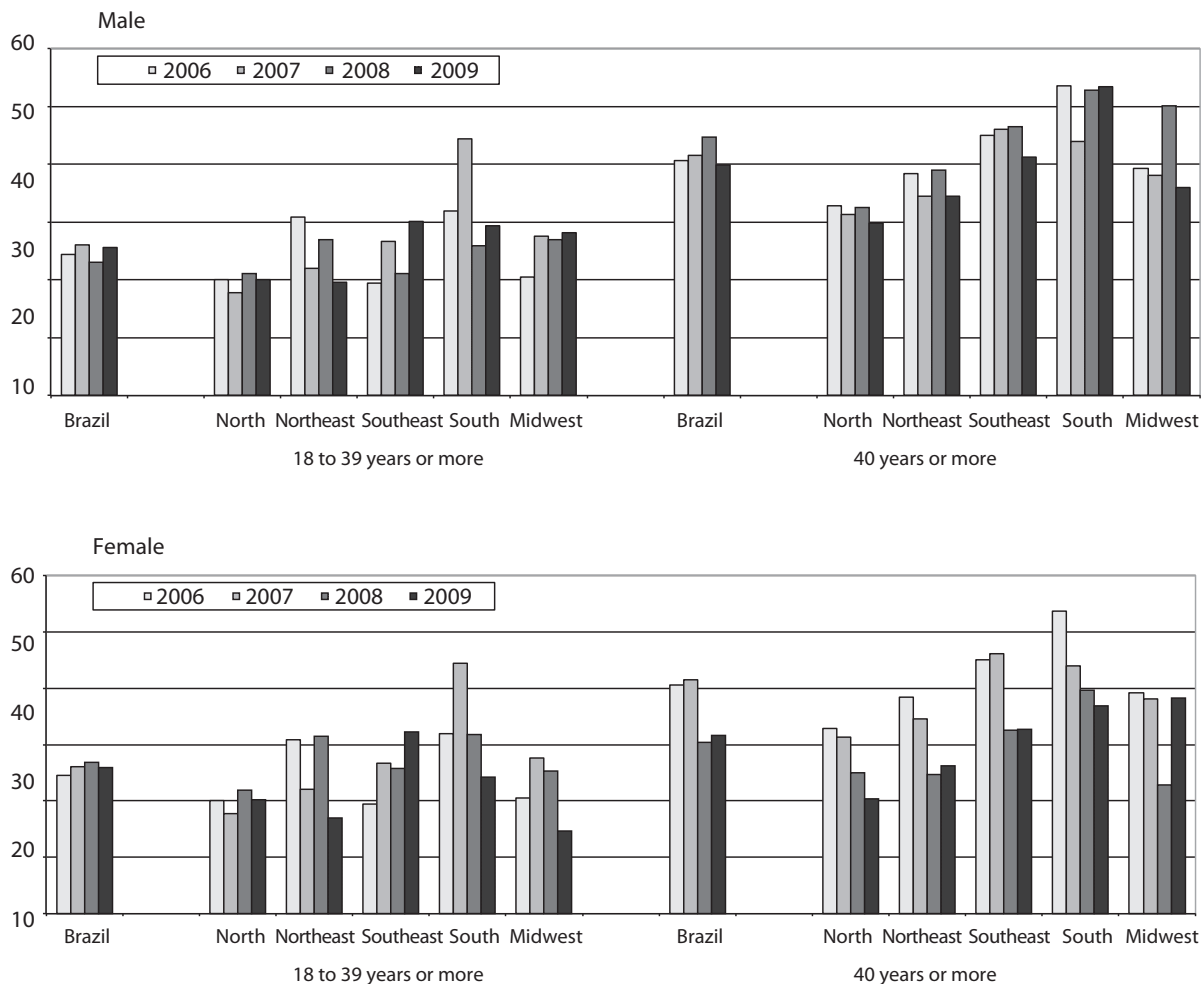


Figure 2. Proportion of smokers that smoke 20 or more cigarettes a day by gender and age group (from 18 to 39 and 40 years and over) in Brazilian capitals, from 2006 to 2009

Figura 2. Proporção de fumantes que fumam 20 cigarros ou mais por dia, segundo sexo, grupo etário (18 a 39 e 40 anos e mais) nas capitais brasileiras, de 2006 a 2009

Discussion

Four annual and consecutive telephone surveys were conducted in the Brazilian capitals from 2006 to 2009 to investigate the risk factors for chronic diseases, making it possible to monitor them. Data from this study on smoking compared in four years show distinct patterns among men and women. The continuous decreasing trend for men is confirmed, except for those living in the South region, but among women, despite presenting lower percentages than men, there has been a decrease only in the

North and Northeast regions. In the South region, there was an important prevalence increase of female smokers, resulting from the increase among the youngest (18 to 29 years old). The study also showed high cessation rates for men and women.

Brazil has been going through an important decrease in smoking for the past decades. From 1989 to 2003, this decrease was estimated in 33.1 to 43.3% for men and 27% for women⁶. However, it is important to remember that household surveys provided information for these estimates.

A special research on smoking (*Pesquisa Especial de Tabagismo - PETab*),

carried out by the Brazilian Institute of Geography and Statistics (IBGE) in Brazil, 2008, estimated the prevalence of smokers in the population aged 15 years or more in 17.2% (21.6% of men and 13.1% of women), ranging from 16.7% in the Southeast region to 19.0% in the South region¹⁵. The present data show prevalence for the population aged 18 years in 2009 of 18.4% among men and 12.4% among women. The comparison with the cited survey should consider that these data were obtained by a telephone survey conducted only in the capitals.

This decrease among men was observed in the youngest group (18 to 29 years), which presented higher prevalence, but not among those aged 60 years or more. As to women, the highest prevalence is observed in intermediate age groups (30 to 59 years), and the increased prevalence among the youngest in the capitals of the South region is a concern.

Likewise, it seems that more and more males have stopped smoking, which is not true for females, except for those from the North region, where a high smoking cessation rate was shown among both men (>11%) and women.

These findings must be carefully analyzed, and some issues should be discussed in order to better understand the direction that these results point to. There are limitations imposed by the use of data from population surveys to measure trends in health. Different methodologies and technologies to collect information may lead to losses and lack of comparability. A recent study which analyzed data from the "New Jersey Adult Tobacco Surveys" from 2005 and 2006 showed that the estimated decrease in smoking prevalence may have happened mostly due to changes in the question order and, to a lower level, to the use of electronic equipment¹⁶.

Even then, despite the fact that the comparisons were not statistically significant, the trends seem to be similar to those of studies carried out in other

countries with the same objective. One study which aimed at analyzing the trend in smoking prevalence in three regions of France showed a decrease of 40 to 24.3% among men from 1985 to 1987 and from 2005 and 2007; among women, there was an increase of 18.9 to 20% in the same period¹⁷.

The inverse relation among years of study and smoking prevalence, described in the first year of VIGITEL¹¹ and confirmed in the present study from 2006 to 2009 in all regions of the country, has also been described in other countries. In Italy, with data from surveys conducted in 2004 and 2005 analyzed by birth, gender and education, Sardu et al.¹⁸ concluded that men with low schooling had higher chances of smoking and less chances of cessation.

In Alberta, Canada, three national surveys performed between 2000 and 2005 showed that the number and prevalence of smokers were high among women and men aged from 20 to 39 and 40 to 59 years and among youngsters (aged 12 to 19 years) or those aged more than 60 years, the prevalence tended to increase in the rural zone and to be inversely proportional to the education level¹⁹.

In South Africa, the analysis on tobacco use patterns by Demographic and Health Surveys, conducted from 1998 and 2003, showed that high income and schooling were associated with the low smoking prevalence, while living in the urban area was associated with smoking. However, black men and women smoked less than other population groups²⁰.

Besides monitoring the prevalence of smokers, it is essential to monitor smoking cessation to determine control actions in a population. The cessation index, measured by a household survey²¹ conducted between 2003 and 2005 in 17 Brazilian capitals and the Federal District, ranged from 41 to 58% for men and 42 to 59% for women. VIGITEL data regarding the years 2006 to 2009 showed higher rates (59 to 61% for men and 60 to 64% for

women). These are also higher than the data reported (41%) in a population survey conducted in the city of Belo Horizonte, in 2003, which included individuals aged 20 years or more²². Even with the aforementioned limitations, which do not enable a direct comparison with data from household surveys, the higher rates from this telephone survey should be further analyzed with details on age groups and schooling, in order to better explore the characteristics of people who stopped smoking and the access to services that care for smoking. PETA data show that, among smokers and ex-smokers aged 15 years or more, 43.0% of men and 49.5% of women tried to smoke in the past 12 months¹⁵. This shows that the demand for health care regarding smoking cessation should be high, and the National Unified Health System (*Sistema Único de Saúde* – SUS) should be prepared to offer services with this purpose.

Among the study limitations, it is possible to point out the use of telephone survey among household residents with a telephone line, which excludes the part of the population that does not have access to this benefit. Such limitation is partially corrected with post-stratification weight, based on the socioeconomic distribution of Census 2000. The correction adopted by VIGITEL “approximates” the estimates generated by the system to those that would be observed if the telephone service coverage were universal or did not present any differences among population strata¹².

The success in the reduction of smoking rates in Brazil has also been described among youngsters. The prevalence of adolescents in the survey

performed in 2009 among scholars in Brazilian capitals^{23,24} was 6.3%, much lower than what has been reported in previous studies, which demonstrated prevalence ranging from 10.7% in Florianópolis, 12.6% in Curitiba, and 17.7% in Porto Alegre²⁵. This evidence is important when it comes to public policies, because adolescents who smoke have high chances of becoming adults who smoke, thus increasing the morbimortality risk associated with smoking²⁶.

It is possible that cigarette consumption has decreased in the country together with the smoking prevalence. However, this study does not demonstrate a decrease pattern related to the percentage of smokers who reported smoking 20 or more cigarettes a day. Because Brazil already reached lower prevalence rates than most countries in the West²⁷, the continuation of this reduction in the next years will depend on extra efforts, especially in specific regions and policies. Such remark strengthens the need to intensify smoking cessation actions in SUS, as well as the law, which maintains the prohibition to smoke in closed public or private spaces, and is already established in some states of the country²⁸; this initiative should spread to the entire country.

It is important that the improvement on smoking control policies decrease the existing differences at the active and passive exposure to tobacco among individuals in different population strata. The reduction in the prevalence of smokers to levels inferior to the current ones will effectively assure the prevention of most chronic diseases that affect the Brazilian population.

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