

Population-based evidence of a strong decline in the prevalence of smokers in Brazil (1989–2003)

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ABSTRACT

Objective: To evaluate the evolution in smoking indicators in the adult Brazilian population from 1989 to 2003.

Methods: Comparison of smoking indicators stratified by age, sex, and sociodemographic variables from two comparable household surveys conducted using probabilistic samples of the Brazilian population aged ≥ 18 y ($n = 34,808$ in 1989 and $n = 5,000$ in 2003). We used age-adjusted prevalence ratios and differences in means between the two surveys, with corresponding 95% confidence intervals (CIs), to assess the statistical significance of time-trends in the smoking indicators.

Findings: Between 1989 and 2003, there was a substantial decrease in prevalence of smoking (from 34.8% to 22.4%; age-adjusted prevalence ratio = 0.65; 95% CI: 0.60 to 0.70) and a modest reduction in the mean number of cigarettes smoked per day (from 13.3 to 11.6; age-adjusted difference: -1.8; 95% CI: -2.6 to -1.0). The reductions in both prevalence and intensity of smoking were greater among males, younger age groups, and higher socioeconomic strata.

Conclusion: The decline in the prevalence of smoking in the adult Brazilian population between 1989 and 2003—35% in 14 years, or an average of 2.5% per year—was exceptional, surpassing the reduction seen in other countries that, during the same period, implemented wide-ranging and rigorous policies for controlling smoking. The more intense decline in smoking in younger age groups was consistent with (a) the concentration of the efforts of the Brazilian tobacco control program on preventing the onset of smoking among youths and (b) the total prohibition of cigarette advertisement. We recommend the intensification of program initiatives targeting women and less economically favored populational strata.

INTRODUCTION

The adverse consequences of tobacco smoking to health have been known since at least the 1950s.^{1,2} Since then, there has been increasing evidence of the extension and severity of tobacco-associated health hazards. Even the large, multinational cigarette companies, who previously denied the problem and questioned the validity of scientific studies, now explicitly admit the adverse consequences of tobacco smoking. There is scientific evidence that even non-smokers exposed to tobacco smoke have greater incidence of cancer, cardiovascular disease, and respiratory disease.³ As well as a risk factor for a variety of diseases, smoking is characterized by chemical dependence, falling into a model of chronic disease with long-term natural history and with periods of recurrence and remission.⁴

Notwithstanding, the knowledge of the risks of tobacco smoking accumulated throughout the years has not been enough to reduce its worldwide consumption. In fact, consumption has been increasing at an alarming rate in developing countries as a result of sophisticated global promotion strategies developed by large multinational companies. Favored by the liberalization of commerce brought about by globalization, such companies are promoting a rapid transferal of tobacco consumption from rich to poor countries.⁵ In 1999, smoking already accounted for four million annual deaths (worldwide), one-half of which occurred in developing countries; with current trends, the number of deaths attributed to smoking will double and seven of every ten tobacco-related deaths will take place in developing countries.⁶

In light of the adverse effects of smoking and the evidence of its increased consumption, especially in developing countries, the World Health Assembly approved a number of wide-ranging resolutions to contain the global demand for tobacco—culminating in 1999 with the sanction of the Framework Convention on Tobacco Control, a set of multisectoral actions aimed to detain the expansion and consequences of tobacco consumption in the world.^{7,8}

Despite being the second greatest producer of tobacco in the world, Brazil has a notable record of initiatives aimed at combating smoking. The origin of such initiatives dates

back to the 1970s, when scientific medical societies began to work towards enlightening the Brazilian population about the health hazards associated with smoking, at the same time pressuring the Ministry of Health to assume responsibility for controlling the problem.⁹ However, coordinated and persistent initiatives did not begin until 1989, when the Ministry of Health assigned the coordination of a national tobacco control program to its Cancer Institute. The initiatives in this program gained in strength, organization, and consistency throughout the years. These initiatives evolved from a campaign-oriented character in the early 1990s to a set of measures of nationwide scope, involving, among others, the education of the population and pressure on government agencies and the congress to adopt fiscal measures to increase the price of cigarettes and to approve laws prohibiting the advertising of tobacco products and smoking in public places. A complete description of the strategies and actions performed by the Brazilian tobacco control program between 1989 and 2003 can be found elsewhere.¹⁰

The absence, to this date, of repeated and comparable national surveys on smoking in Brazil has prevented the adequate evaluation of the results of the Brazilian tobacco control program. Indirect evidence of the program's success can be deduced based on: (a) the declining trend in cigarette commercialization in the country and (b) comparisons between the prevalence of smoking in large Brazilian cities in the early 2000s and that based on the only national survey of smoking available at the time, which was conducted in 1989.¹⁰ A second national smoking survey, carried out in 2003, allowed us to assess changes in the prevalence and intensity of smoking in Brazil during a period marked by a notable body of measures for containing tobacco consumption. This is the primary goal of the present article.

METHODS

The data sources for the present study were two national household surveys conducted in Brazil in 1989 and 2003: (1) the National Survey of Health and Nutrition, carried out between June and September 1989 and (2) the World Health Survey, carried out between January and September 2003. Similar stratified, clustering sampling procedures applied to census lists of all Brazilian households (except those located in the sparsely populated rural areas of the North Region) were used in the two

surveys.^{11,12} The 1989 survey studied a probabilistic sample of 17,920 households and investigated smoking among all subjects aged ≥ 15 y within these households. The 2003 survey studied a probabilistic sample of 5,000 households and randomly selected one household member aged ≥ 18 y to obtain information on smoking. The present study considered only subjects aged ≥ 18 y from both surveys, which included 34,808 from the 1989 survey and 5,000 from the 2003 survey. Household participant rate exceeded 70% in the two surveys and there were no non-responses for questions regarding smoking in either survey.

The 1989 survey used two questions to evaluate smoking: (1) "Do you smoke cigarettes, a pipe, or cigars?", having "yes" and "no" as possible answers; and (2) (If yes) "How much do you smoke per day?". Two questions were employed in the 2003 survey to evaluate current smoking: (1) "Do you currently smoke any tobacco product (i.e., cigarettes, cigars, or a pipe)?", possible answers being "daily"; "yes, but not daily"; and "no"; (2) (If daily) "What amount of the following products (i.e., cigarettes, hand-rolled cigarettes, a pipe, cigars, and other) do you smoke per day?". In both surveys, the questions on smoking as well as all other questionnaire items were applied by trained interviewers.

The present study investigated two indicators of smoking: (1) the prevalence of smokers and (2) the mean number of cigarettes or similar products smoked per day. We considered smokers to be all subjects who answered "yes" to the first question of the 1989 survey and all those who answered "daily" or "yes, but not daily" to the first question of the 2003 survey. In the absence of information on the total number of cigarettes or similar products smoked by non-daily smokers in the 2003 survey (approximately 10% of total smokers), the consumption equivalent to one cigarette per day was attributed to these non-daily smokers.

The comparison between smoking indicators obtained from the two surveys was done separately for men and women, according to age group, urban or rural location of household, schooling, and three categories of family purchasing-power (i.e., low-, medium-, and high-). Purchasing-power was based on per capita family income in 1989 and on the number of consumer goods in the household in 2003. The low-, medium-,

and high-purchasing-power categories originally employed by the 2003 survey corresponded to 0 to 3, 4 to 7, and ≥ 8 consumer goods and involved 32.7%, 53.3%, and 14.0% of the studied individuals, respectively. In 1989, the same three categories of purchasing-power corresponded to groups of increasing income with the same proportion of subjects found in the three classes of consumer goods in the 2003 survey.

For the statistical analysis of time trends in smoking indicators, we calculated (1) age-adjusted prevalence ratios, with 95% CIs, using Poisson regression with robust variance and (2) age-adjusted differences in mean values, with 95% CIs, using linear regression models. Sampling weights and the effect of the complex sampling design on standard errors were dealt with using the survey commands of Stata software, Version 9.2.¹³

RESULTS

The estimated frequency of smokers among the Brazilian adult population was 34.8% in 1989 and 22.4% in 2003, showing a marked (approximately 35%) and statistically significant decline in smoking prevalence. Decline among males (37%) was slightly higher than among females (32%) and, as a consequence, the relative excess of smokers in the male population was reduced only slightly (from 1.6 to 1.5 times). In both sexes, the reduction in smoking was substantial and statistically significant across all age groups, with more intense declines in younger groups (< 35 y) and among the elderly (≥ 65 y) than among other age groups. In the case of men, this trend determined a delay in the “peak” of smoking prevalence from the 25–44 to the 45–64 y group. In the case of women, the highest prevalence moved from the 24–44 to the 35–54 y group (Table 1).

< Table 1 about here >

Substantial and statistically significant declines in the prevalence of smoking were observed for both sexes, for both urban and rural settings, and across different socioeconomic strata of the adult Brazilian population, when either schooling level or family purchasing-power was considered. For both sexes, the intensity of decline was a direct function of family purchasing-power. The relative excess of smokers in the lowest

purchasing-power stratum—in relation to the highest—increased by approximately 100% between 1989 and 2003. A similar trend of lower decline in the prevalence of smoking among groups of lower socioeconomic status was found among women, but not among men, when the population was stratified according to schooling (Table 2).

< Table 2 about here >

The mean number of cigarettes consumed by Brazilian male smokers was reduced significantly between surveys (from 14.9 to 12.6 cigarettes per day). This reduction was minimal among female smokers (from 10.9 to 10.2 cigarettes per day) and did not reach statistical significance. Among men, as was the case with the reduction in frequency of smoking, the reduction in mean number of cigarettes smoked per day tended to be greater among younger subjects, again showing an advantage for younger cohorts. It is interesting to note that, among subjects aged ≥ 65 y, the mean number of cigarettes consumed remained virtually constant among men and increased among women (Table 3).

< Table 3 about here >

Statistically significant reductions in the mean number of cigarettes smoked per day were detected both in urban and rural settings, for all levels of schooling, and for the high- and medium-purchasing-power categories. In the case of female smokers, statistically significant reductions were observed only among the subjects with at least nine years of schooling. Increases, albeit not significant, in the number of cigarettes smoked per day were observed among women with less than 5 years of schooling and among those with low-purchasing-power. The evolution in the number of cigarettes smoked per day led to a substantial reduction in the relative “protection” of the less affluent strata. For example, in 1989, men with high-purchasing-power smoked an average 7.2 cigarettes more per day than men of low-purchasing-power, whereas in 2003, this difference was only 2.9 cigarettes per day. In the same period, the difference in the mean number of cigarettes smoked by women with high (≥ 12 years) and low (< 5 years) schooling reduced from 5.2 to 1.2 cigarettes per day (Table 4).

< Table 4 about here >

DISCUSSION

Two household surveys conducted in 1989 and 2003 on probabilistic samples of the Brazilian adult population showed evidence of a substantial decline (roughly 35%) in the prevalence of smokers and a modest reduction (about 2 cigarettes per day) in the mean number of cigarettes smoked. Both the decline in prevalence and the reduction in the intensity of smoking tended to be stronger among males, younger age groups, and higher socioeconomic strata.

The rigorously probabilistic character of the two national surveys and the consistency of the prevalence estimates obtained in these surveys with those of independent studies conducted in large Brazilian cities in 1989^{14,15} and 2003,¹⁶⁻¹⁸ reinforce the validity of the observed decline in smoking in Brazil. The magnitude of this decline is also in agreement with the 47.5% estimated decline in the annual per capita availability of cigarettes in the country (calculated as production plus importation minus exportation/population \geq 15 years) between 1990 and 2000.¹⁹

It is interesting to note that the estimated annual cigarette availability in Brazil in 1990—1,601 cigarettes per capita—divided by the proportion of smokers estimated in the 1989 survey (0.346) results in a consumption rate of 4,627 cigarettes per smoker per year, or 12.7 cigarettes per day. This consumption rate is only slightly lower than the 13.3 cigarettes per day estimated directly by the 1989 survey. Likewise, the estimated annual cigarette availability for 2000 (869 cigarettes per capita) divided by the proportion of smokers in 2003 (0.224) results in a yearly consumption of 3,879 cigarettes per smoker, or 10.6 cigarettes per day—a number also only slightly lower than the 11.6 cigarettes per day estimated directly by the 2003 survey.

The decline in the prevalence of adult smokers in Brazil between 1989 and 2003—35% in 14 years, or an average of 2.5% per year—is exceptional from various standpoints. In a similar period, the same annual rate of decline of smoking was 0.6% in Japan, 0.7% in the United States, and 0.8% in the United Kingdom.²⁰ Even in the four American states with the most successful tobacco control programs (i.e., California, Massachusetts, Arizona, and Oregon), the annual decline in the prevalence of smoking was never higher

than 1%.²¹ South Africa and Thailand, which in the 1990s implemented wide-ranging and rigorous policies for the control of smoking, recorded annual declines in the prevalence of smoking during this period of 1.8% and 1.9%, respectively.^{22, 23}

It should be noted that the 22.4% prevalence of smoking in 2003 among adults in Brazil (Table 1), albeit still high, places the country in a favorable position in relation to other countries undergoing economic transition (estimated 32.7% of smokers), to developed countries (27.4%), and to developing countries (28.9%).¹⁹ In the Americas, the percentage of smokers in Brazil is closer to that of the United States (20.8% in 2004)²⁴ and Canada (20% in 2005)²⁵ than to that of other Latin-American countries such as Mexico (34.8% in 1998), Cuba (37.2% in 1995), or Argentina (40.4% in 2000).²⁰

It should also be noted that the more intense decline in smoking among younger age groups indicates a probable cohort effect, which allows us to anticipate additional declines in the frequency of smokers in the country. The more intense decline in smoking among younger age groups is consistent with the concentration of efforts of the Brazilian program on reducing the onset of smoking among youths. These efforts are translated into educational measures in schools (7,709 schools involved as of 2002) and the total prohibition of advertisement of cigarettes (despite the opposition of a strong alliance involving cigarette manufacturing companies, mass media, tobacco producers, and automobile racing promoters).¹⁰ Especially encouraging is the fact that the intense reduction in the prevalence of smoking in the 18–24 y group (from 29% to 17.8%) led to a prevalence in this group much lower than that of countries such as the United States and Canada (28% and 31%, respectively).^{24,25}

Tobacco use by younger generations should concern us for a number of reasons²⁶, including the fact that about 70% of adult smokers in large Brazilian cities began to smoke before age 20.¹⁶ One of the most efficient ways to inhibit smoking among youths is to increase the price of cigarettes.²⁷ This is particularly important in Brazil, where the price of cigarettes is still one of the lowest in the world.¹⁰ In Brazil, the price of a pack of one of the most worldwide popular brands of cigarettes is equivalent to US\$0.85, versus approximately US\$1.50 in other Latin American countries and about US\$4 in most developed countries.²⁸

The less intense decline in smoking among females suggests that the initiatives of the Brazilian tobacco control program were less efficient among this group. Indeed, the increase in smoking among women, especially in developing countries, is acknowledged as being one of the great global challenges to public health.²⁹ Worthy of note are marketing strategies that specifically target the female universe, attempting to associate cigarette consumption with an aura of modernity, independence, style, sophistication, glamour, and physical fitness.^{30,31} Aesthetic factors underlying the decision to smoke also seem to be more relevant among women than men. Women begin, and continue to smoke, in order to remain thin—an aspect extensively exploited in marketing strategies for products designed specifically for the female public.²⁹

The trend seen in Brazil—towards a less marked decline in smoking among lower socioeconomic strata—reproduces the usual trend of decline in smoking seen in developed countries.³² The relationship between smoking and poverty is complex, since poverty may favor smoking and smoking may, in turn, contribute to the impoverishment of smokers and their families.³² As in the case of youths, the increase in taxation of cigarette sales and the corresponding increase in the price of these products seem to be especially efficacious in inhibiting consumption among lower income groups.³² This is another powerful argument that recommends the intensification of fiscal instruments in the Brazilian tobacco control policy.

The mean number of cigarettes smoked per day by Brazilian smokers was modestly reduced among young and middle-aged adults but remained constant or even increased among the elderly. This finding may be attributed to the intense decline in the frequency of smokers, per se, along with a possible selection of individuals with a greater degree of addiction to tobacco. This seems plausible among men but not among women: heavy smokers (20 or more cigarettes smoked per day) represented 28.6% of all male smokers in 1989 (12.4% of 43.3%) and 32.1% in 2003 (8.7% of 27.1%) while heavy smokers represented 26.7% of all female smokers in 1989 (7.2% of 27.0%) and 24.5% in 2003 (4.5% of 18.4%). However, another explanation could exist in the case of the older adults who tend to stay home longer and, therefore, were less exposed to the restrictions on smoking in public places. There is evidence that restrictions at the

workplace led smokers to smoke less by disrupting the automatic component of smoking.³³ Brazilian legislation has prohibited smoking in closed public environments since 1996, and since the early 1990s, the promotion of smoke-free environments has with 1,102 companies and 2,864 healthcare units having adhered (as of 2002).¹⁰

In any case, the fact that near 30% of Brazilian smokers smoke 20 or more cigarettes per day suggests that there is a relevant proportion of smokers with a high degree of physical dependence on nicotine, who therefore require therapeutic support based on behavioral or medicamentous approaches in order to quit smoking. This scenario entirely justifies the efforts currently expended by the Brazilian program to increase the supply and quality of public services specializing in helping smokers to quit smoking.¹⁰

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Table 1 – Temporal variation in prevalence (%) of smokers according to sex and age. Adult population of Brazil (≥ 18 y), 1989 and 2003.

Age (years)	Men			Women			Total		
	1989	2003	PR 2003/1989 (95%CI)	1989	2003	PR 2003/1989 (95%CI)	1989	2003	PR 2003/1989 (95%CI)
18-24	34.1 (1.2)	21.9 (2.4)	0.64 (0.51 – 0.81)	24.2 (1.1)	13.7 (1.8)	0.56 (0.43 – 0.74)	29.0 (1.0)	17.8 (1.6)	0.61 (0.51 – 0.74)
25-34	48.2 (1.1)	29.6 (2.4)	0.61 (0.52 – 0.73)	33.6 (1.1)	19.0 (1.7)	0.56 (0.47 – 0.68)	40.6 (0.8)	23.6 (1.4)	0.58 (0.51 – 0.66)
35-44	48.6 (1.3)	26.2 (2.1)	0.54 (0.46 – 0.64)	29.2 (1.1)	24.2 (1.9)	0.83 (0.70 – 0.98)	38.6 (0.9)	25.1 (1.5)	0.65 (0.57 – 0.74)
45-54	45.3 (1.4)	34.5 (2.9)	0.76 (0.64 – 0.91)	26.2 (1.3)	20.7 (2.1)	0.79 (0.63 – 0.99)	35.3 (1.1)	26.7 (1.9)	0.76 (0.65 – 0.88)
55-64	45.7 (1.9)	31.8 (3.0)	0.70 (0.57 – 0.85)	21.1 (1.4)	16.7 (2.4)	0.79 (0.58 – 1.07)	32.7 (1.2)	23.5 (1.9)	0.72 (0.60 – 0.88)
≥ 65	33.5 (1.9)	19.1 (2.6)	0.57 (0.43 – 0.76)	18.4 (1.5)	9.8 (2.0)	0.53 (0.34 – 0.82)	25.1 (1.3)	14.6 (1.6)	0.58 (0.46 – 0.74)
Total	43.3 (0.7)	27.1 (1.1)	0.63 ¹ (0.58 – 0.69)	27.0 (0.6)	18.4 (0.9)	0.68 ¹ (0.61 – 0.76)	34.8 (0.5)	22.4 (0.8)	0.65 ¹ (0.60 – 0.71)

PR: prevalence ratio; 95% confidence interval (CI); standard error of prevalences in parentheses.

(1) PR adjusted for age.

Table 2 – Temporal variation in prevalence (%) of smokers according to sociodemographic variables. Adult population of Brazil (≥ 18 y), 1989 and 2003.

Variables	Men			Women			Total		
	1989	2003	PR 2003/1989 ¹ (IC 95%)	1989	2003	PR 2003/1989 ¹ (IC 95%)	1989	2003	PR 2003/1989 ¹ (IC 95%)
Household settings:									
Urban	41.1 (0.8)	26.2 (1.3)	0.65 (0.59 – 0.72)	26.5 (0.6)	18.2 (1.0)	0.67 (0.52 – 0.85)	33.3 (0.6)	21.8 (0.8)	0.66 (0.61 – 0.71)
Rural	50.0 (1.0)	31.8 (2.6)	0.63 (0.53 – 0.75)	29.0 (1.1)	19.6 (2.4)	0.68 (0.52 – 0.87)	39.9 (0.9)	25.5 (2.0)	0.64 (0.54 – 0.74)
Years of schooling:									
0-4	48.2 (0.8)	32.2 (1.7)	0.68 (0.61 – 0.76)	28.1 (0.7)	22.8 (1.5)	0.84 (0.73 – 0.97)	37.8 (0.6)	27.0 (1.2)	0.74 (0.67 – 0.81)
5-8	41.4 (1.3)	29.4 (2.3)	0.71 (0.60 – 0.84)	29.6 (1.2)	19.5 (1.6)	0.65 (0.55 – 0.77)	35.4 (1.0)	24.1 (1.3)	0.68 (0.60 – 0.76)
9-11	33.3 (1.5)	19.3 (1.9)	0.59 (0.48 – 0.74)	22.2 (1.2)	11.0 (1.6)	0.51 (0.37 – 0.69)	27.1 (1.0)	14.9 (1.3)	0.56 (0.46 – 0.66)
≥ 12	28.8 (2.1)	18.1 (2.5)	0.70 (0.52 – 0.95)	21.5 (1.4)	13.4 (2.0)	0.67 (0.49 – 0.93)	25.0 (1.2)	15.6 (1.7)	0.67 (0.53 – 0.81)
Household purchasing-power:									
Low	50.5 (1.0)	35.8 (2.1)	0.72 (0.63 – 0.81)	32.7 (1.1)	23.4 (1.8)	0.72 (0.61 – 0.84)	40.9 (0.9)	29.0 (1.5)	0.71 (0.64 – 0.78)
Medium	42.1 (0.9)	24.9 (1.4)	0.60 (0.53 – 0.67)	25.1 (0.7)	16.9 (1.2)	0.67 (0.58 – 0.79)	33.4 (0.6)	20.6 (1.0)	0.62 (0.56 – 0.68)
High	35.2 (1.7)	18.9 (2.7)	0.55 (0.41 – 0.74)	22.8 (1.1)	13.4 (2.1)	0.59 (0.43 – 0.81)	28.7 (1.0)	15.9 (1.8)	0.56 (0.45 – 0.67)

PR: prevalence ratio; 95% confidence interval (CI); standard error of prevalences in parentheses.

(1) PR adjusted for age.

Table 3 – Temporal variation in mean number of cigarettes smoked per day, according to sex and age. Adult population of Brazil (≥ 18 y), 1989 and 2003.

Age (years)	Men			Women			Total		
	1989	2003	DM 2003-1989 (95%CI)	1989	2003	DM 2003-1989 (95%CI)	1989	2003	DM 2003-1989 (95%CI)
18-24	12.4 (0.4)	8.9 (1.0)	-3.5 (-5.6 – -1.4)	10.1 (0.4)	8.5 (1.4)	-1.6 (-4.4 – 1.2)	11.4 (0.3)	8.7 (0.8)	-2.7 (-4.3 – -1)
25-34	14.9 (0.3)	13.1 (1.2)	-1.8 (-4.2 – 0.6)	11.6 (0.4)	10.0 (0.6)	-1.6 (-3.1 – -0.2)	13.5 (0.2)	11.6 (0.7)	-1.8 (-3.3 – -0)
35-44	16.6 (0.4)	13.3 (1.0)	-3.4 (-5.4 – -1.3)	11.9 (0.4)	12.3 (0.8)	0.4 (-1.3 – 2.1)	14.8 (0.3)	12.8 (0.6)	-2.0 (-3.3 – -0)
45-54	16.4 (0.5)	14.7 (1.2)	-1.7 (-4.3 – 0.9)	11.2 (0.5)	10.6 (1.1)	-0.6 (-2.9 – 1.7)	14.4 (0.4)	12.9 (0.8)	-1.5 (-3.3 – 0)
55-64	15.4 (0.6)	13.7 (1.4)	-1.7 (-4.6 – 1.2)	9.1 (0.5)	6.5 (1.1)	-2.6 (-5.0 – -0.2)	13.2 (0.5)	10.9 (1.0)	-2.3 (-4.5 – -0)
≥ 65	11.4 (0.6)	11.3 (1.5)	-0.1 (-3.4 – 3.1)	8.0 (0.6)	9.8 (2.0)	1.8 (-2.2 – 5.8)	10.0 (0.5)	10.8 (1.2)	0.8 (-1.8 – 3)
Total	14.9 (0.2)	12.6 (0.5)	-2.3 ¹ (-3.4 – -1.1)	10.9 (0.2)	10.2 (0.4)	-0.8 ¹ (-1.7 – 0.2)	13.3 (0.2)	11.6 (0.4)	-1.8 ¹ (-2.6 – -1)

DM: difference in means; 95% confidence interval (CI); standard error of prevalences in parentheses.

(1) PR adjusted for age.

Table 4 – Temporal variation in mean number of cigarettes smoked per day according to sociodemographic variables. Adult population of Brazil (≥ 18 y), 1989 and 2003.

Variables	Men			Women			Total		
	1989	2003	DM 2003-1989 ¹ (95%CI)	1989	2003	DM 2003-1989 ¹ (95%CI)	1989	2003	DM 2003-1989 ¹ (95%CI)
Household setting:									
Urban	16.2 (0.3)	13.4 (0.6)	-2.8 (-4.0 – -1.5)	11.8 (0.3)	10.8 (0.5)	-1.1 (-2.2 – 0.0)	14.3 (0.2)	12.2 (0.4)	-2.2 (-3.1 – -1)
Rural	11.7 (0.3)	9.3 (1.0)	-2.4 (-4.4 – -0.4)	8.0 (0.2)	7.2 (0.8)	-0.9 (-2.6 – 0.8)	10.4 (0.2)	8.5 (0.7)	-2.0 (-3.5 – -0)
Years of schooling									
0-4	13.7 (0.2)	11.8 (0.7)	-1.9 (-3.4 – -0.4)	9.5 (0.2)	9.6 (0.6)	0.0 (-1.3 – 1.3)	12.1 (0.2)	10.8 (0.5)	-1.4 (-2.4 – -0)
5-8	16.1 (0.4)	12.5 (1.0)	-3.8 (-5.9 – -1.7)	12.6 (0.4)	11.8 (0.9)	-1.0 (-2.9 – 1.0)	14.6 (0.3)	12.2 (0.7)	-2.8 (-4.2 – -1)
9-11	17.6 (0.6)	15.6 (1.3)	-3.2 (-6.0 – -0.3)	13.1 (0.7)	9.7 (1.3)	-3.6 (-6.3 – -0.9)	15.5 (0.4)	13.3 (1.0)	-2.9 (-4.9 – -0)
≥ 12	20.0 (1.2)	13.1 (1.7)	-6.8 (-10.8 – -2.9)	14.7 (0.9)	10.8 (1.2)	-4.4 (-7.7 – -1.1)	17.6 (0.7)	12.0 (1.1)	-6.4 (-9.2 – -3)
Household purchasing-power:									
Low	12.2 (0.3)	11.2 (0.8)	-1.0 (-2.6 – 0.5)	8.6 (0.3)	8.8 (0.7)	0.3 (-1.2 – 1.7)	10.6 (0.2)	10.2 (0.5)	-0.6 (-1.6 – 0)
Medium	15.5 (0.2)	13.5 (0.7)	-2.0 (-3.5 – -0.5)	11.7 (0.3)	10.9 (0.6)	-0.9 (-2.2 – 0.4)	14.0 (0.2)	12.3 (0.5)	-1.8 (-2.9 – -0)
High	19.4 (0.6)	14.1 (1.6)	-5.7 (-9.2 – -2.3)	14.3 (0.6)	12.3 (1.4)	-2.2 (-5.2 – 0.7)	17.3 (0.4)	13.2 (1.2)	-4.5 (-6.9 – -2)

DM: difference in means; 95% confidence interval (CI); standard error of prevalences in parentheses.

(1) PR adjusted for age.