

Changes and determinants in cigarette smoking prevalence in southwestern France, 1985–1997

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Objective and methods: Smoking trends were assessed in southwestern France for the period 1985–1997 using data from the MONICA population surveys conducted in the Toulouse region. **Results:** Smoking prevalence decreased in men and remained stable in women, with the exception of age group 35–44 years (stabilization in men, increase in women). In both genders, prevalence of ex-smokers increased. Higher educational level was negatively associated with smoking in men and positively associated in women; in both genders, older age was negatively associated with smoking. **Conclusions:** In southwestern France, the decrease or stabilization in smoking prevalence is due to an increase in ex-smokers rather than in never smokers.

Keywords: cigarette smoking, France, prevalence, trends

More than 60,000 deaths each year are attributable to smoking in France, and this number is likely to increase to 165,000 by 2025.¹ In a previous study,² it has been shown that the prevalence of cigarette smoking decreased between 1985 and 1991 among men living in southwestern France, but whether this decrease has continued afterwards and how the prevalence of cigarette smoking has evolved among French women is still unknown. Further, several studies have shown that prevalence of cigarette smoking differs according to age, gender or to educational level,³ but little is known regarding these effects in France.⁴ Thus, data from the three Toulouse-MONICA population surveys were used to assess the trends in the prevalence of cigarette smoking in southwestern France.

METHODS

Populations

The aim and methodology of the WHO-MONICA Project has been described previously.^{5,6} Briefly, each participating centre carried out two or three population surveys on cardiovascular risk factors during a 10-year study period. The sampling strategy was to have representative probability samples within each sex and 10-year age group, at least for the age range 35–64 years. Polling lists available in each town hall and a list of foreigners living in the survey area were used for sampling. Informed consent was obtained before the survey. In Toulouse, the initial survey was performed during May 1985 – February 1987 in both genders; the middle survey

was conducted from November 1988 to May 1991 and concerned only men; the final survey started in December 1994 and ended in July 1997 and concerned again both genders. The samples were considered as representative by the MONICA data centre. Participation rates for men were 73%, 65% and 67% for the initial, middle and final surveys, respectively; for women, participation rates were 67% and 59% for the initial and final surveys, respectively.

Data collection

Screening included standardized questionnaires on personal data and clinical measurements. Subjects were considered as current smokers if they answered yes to the question 'do you currently smoke cigarettes?'. Among current smokers, the type (filter or non-filter) and number of cigarettes smoked per day was also assessed. Subjects were considered as inhalers if they answered positively to the question 'do you inhale the tobacco smoke?'. Subjects were considered as ex-smokers if they had stopped smoking at least one year before the survey. Only subjects with available smoking data were included in the analysis.

Statistical analysis

In all, data from 3095 subjects (1881 male, 1214 female) were studied: 1323 subjects (678 male, 645 female) in the initial survey, 589 male subjects in the middle survey and 1183 subjects (614 male, 569 female) for the final survey. Analysis was performed using Epi-Info (WHO, Geneva, Switzerland) and SAS (SAS Institute, Cary, North Carolina, USA) statistical software. Categorical data are presented as number and (percentage) or as percentage of subjects and (95% confidence interval); continuous data are presented as mean \pm standard deviation or as adjusted mean \pm standard error. Statistical significance was considered for $p < 0.05$.

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RESULTS

In men, prevalence of current smokers decreased from the first to the final survey, whereas the prevalence of ex-smokers and non-smokers increased; among current smokers, the type and the amount of cigarettes smoked did not change between surveys (table 1). When the trends were analysed by age group, the decrease in cigarette smoking prevalence was non-significant for age group 35–44 years, whereas for the other age groups the decrease was more pronounced between the first and the middle surveys than between the middle and final surveys (not shown). Finally, subjects who were married, more highly educated, retired or professionally active had lower prevalence of cigarette smoking (table 2), and multivariate logistic regression showed that being married, of older age and of higher educational level were negatively

associated, whereas being on sick leave was positively associated with smoking (not shown).

In women, prevalence of current smokers remained stable, prevalence of ex-smokers increased and of non-smokers decreased from the first to the last survey, and the type and amount of cigarettes smoked did not change between surveys (table 1). The increase in cigarette smoking prevalence was confined to the younger age group (35–44 years), whereas no significant increase was found in the other age groups (table 2). Finally, higher educational level, being professionally active or unemployed was associated with a higher prevalence, whereas marital status was associated with a lower prevalence of cigarette smoking (table 2), and this was confirmed by multivariate logistic regression analysis adjusting for the survey (not shown).

Table 1 Trends in cigarette smoking status and amount of cigarettes consumed, by gender^a

	Men			Test ^b	Women		Test
	Initial n=678	Middle n=589	Final n=614		Initial n=645	Final n=569	
Smoking status							
Current smoker	37 (33–41)	30 (26–34)	24 (21–27)		18 (15–21)	21 (17–24)	
Ex-smoker	35 (31–38)	37 (33–41)	42 (38–46)	26.7***	11 (8–13)	22 (18–26)	35.0***
Non smoker	28 (24–32)	33 (29–37)	34 (30–38)		71 (67–75)	57 (53–61)	
Filter cigarettes	69 (63–75)	not done	72 (64–78)	0.28 NS	90 (84–95)	94 (87–96)	0.34 NS
Number of cigarettes smoked	18 ± 11	19 ± 13	16 ± 11	NS	13 ± 12	13 ± 11	NS

a: Data are expressed as percentage of subjects and (95% confidence interval) or as mean ± standard deviation.

b: Overall statistic analysis by Student's t-test, ANOVA or χ^2 : NS, not significant; * p<0.05; *** p<0.001.

Trend analysis for men: current smokers vs. others: $\chi^2 = 23.44$, p<0.001; ex-smokers vs. others: $\chi^2 = 5.02$, p<0.02.

Table 2 Characteristics of cigarette smokers, by gender^a

	Men			Test ^b	Women		Test
	Initial n=678	Middle n=589	Final n=614		Initial n=645	Final n=569	
Marital status							
Married	201/574 (35)	148/521 (28)	126/546 (23)	18.5***	79/494 (16)	95/460 (21)	4.6*
Other	51/104 (49)	27/64 (42)	25/68 (37)		36/151 (24)	26/108 (24)	
Years of education							
≤7	57/135 (42)	15/46 (33)	8/24 (33)		10/102 (10)	1/23 (4)	
>7–≤11	104/272 (38)	92/281 (33)	60/233 (26)	11.0***	43/286 (15)	46/223 (21)	15.0**
>11–≤14	49/124 (40)	42/145 (29)	45/184 (24)		40/159 (25)	40/183 (22)	
≥15	37/138 (27)	25/112 (22)	38/172 (22)		21/91 (23)	34/138 (25)	
Age group (years)							
35–44	85/222 (38)	77/192 (40)	64/200 (32)		54/214 (25)	66/182 (36)	
45–54	85/228 (37)	50/199 (25)	45/205 (22)	15.9***	36/211 (17)	39/194 (20)	53.9***
55–64	82/228 (36)	48/195 (25)	42/209 (20)		25/220 (11)	16/192 (8)	
Professional activity							
Inactive	–	–	–		25/189 (13)	16/108 (15)	
Active	194/523 (37)	139/458 (30)	110/446 (25)		76/353 (22)	84/341 (25)	
Retired	36/113 (32)	25/107 (23)	27/133 (20)	17.6***	7/61 (11)	5/70 (7)	30.4***
Sick leave	12/26 (46)	9/14 (64)	5/12 (42)		4/31 (13)	1/12 (8)	
Unemployed	10/16 (63)	1/5 (20)	9/23 (39)		3/11 (27)	15/37 (41)	

a: Data are expressed as number of subjects who smoke/total number of subjects and (percentage).

b: Analysis by Mantel–Haenszel test after stratifying for survey: NS, not significant; * p<0.05; ** p<0.01; *** p<0.001.

DISCUSSION

These data indicate that in men, prevalence of current cigarette smoking decreased, but the prevalence of current cigarette smoking in the younger age group (<45) remained stable. The findings are in agreement with other studies⁴ and indicate that the number of subjects who start smoking is relatively constant with time. Indeed, prevalence of ex-smokers increased during the study period, namely between the initial and middle surveys, while it remained stable afterwards.

In women, although the prevalence of current cigarette smoking remained stable between 1985 and 1997, it did increase among younger age groups, which is in agreement with other studies conducted in Europe.⁷⁻¹⁰ Thus, the data indicate that the number of women who have experienced cigarette smoking has increased, but that this increase is compensated by a concomitant increase in quitters, thus maintaining (at least until 1997) a relatively constant prevalence of current smokers.

Of particular interest was to note whether the anti-tobacco law dated 10 January, 1991 ('loi Evin') had any effect on the prevalence of current smokers. Although the average sales of tobacco decreased by 7.3% between 1991 and 1995,¹ these data indicate that the impact of those measures is relatively small among younger age groups, particularly in women. Indeed, it should be noted that the *per capita* expenditure on tobacco prevention in France is the lowest in Europe, less than 1/10th of that of the United Kingdom and less than 1/200th of that in California.¹ Thus, a considerable effort should be made in France in order to prevent the burden of tobacco smoking.

Higher education was significantly related to a lower prevalence among men and to a higher prevalence of smoking among women, which is in agreement with other studies.³ A possible explanation is that highly educated women tend to adopt the behaviour of their male counterparts, or that the stressful pace of life (professional + domestic work) might induce them to smoke. In both genders, being married was significantly associated with a lower smoking prevalence, which is in agreement with other studies.¹¹ A possible explanation might be the better social support for married subjects,¹² which could prevent them from smoking. Conversely, being unemployed or on sick leave were associated with an increase in cigarette smoking in both genders; as for marital status, this indicated that subjects with low social support

are more prone to smoke, although other hypothesis cannot be disregarded.

In summary, these data indicate that in southwestern France, there has been a decrease in the prevalence of smokers and an increase in the prevalence of ex-smokers during the period 1985-1997 in men, but that this decrease was confined mainly to the period 1985-1991. Conversely, the prevalence of smokers remained stable in women, but increased in the younger age group.

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