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Short Communication

Smoking prevalence, cigarette consumption and advice received from physicians: Change between 1996 and 2006 in Geneva, Switzerland

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ABSTRACT

Objective: To assess change between 1996 and 2006 in smoking prevalence, cigarette consumption, quit attempts, motivation to quit and advice received from physicians in Geneva, Switzerland.

Methods: Postal surveys in cross-sectional, representative samples of the general population of Geneva in 1996 and 2006.

Results: There were 742 participants in 1996 (response rate 75%) and 1487 in 2006 (response rate 76%). Smoking prevalence remained stable between 1996 (28.0%, 95% confidence interval: 24.7 to 31.3%) and 2006 (26.5%, 24.3 to 28.7%, $p = 0.46$). Among smokers, cigarette consumption fell from 15 to 13 cig./day between 1996 and 2006 ($p = 0.003$). However, tobacco dependence, as measured by the Heaviness of Smoking Index, remained stable (mean = 1.9 vs. 1.7, $p = 0.18$). The proportion of smokers who made a 24-hour quit attempt in the previous year remained stable (29.2% in 1996, 32.1% in 2006, $p = 0.52$), but more smokers reported that they intended to quit in the next 6 months in 2006 (39.6%) than in 1996 (29.1%, $p = 0.045$). The association between smoking prevalence and income was stronger in 2006 ($\chi^2 = 53.7$, $p < 0.001$) than in 1996 ($\chi^2 = 10.9$, $p = 0.012$). In 2006 (no change since 1996), few smokers reported that, during their last medical visit, their physician told them to quit smoking (27.3%) or offered them help to quit (13.3%).

Conclusions: Over these 10 years, smoking prevalence, nicotine dependence levels and the frequency of quit attempts remained stable, but smokers' motivation to quit increased. We observed a growing social gap in smoking prevalence and cigarette consumption. Smoking cessation advice was seldom received during medical visits.

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1. Introduction

In many western European countries, smoking prevalence started to decrease since the 1960s in men and since the 1980s or 1990s in women (Hill & Laplanche, 2004). In Switzerland, the level of cigarette consumption is very high in international comparison (Guindon & Boisclair, 2003), and started to decrease only after 1985 (ISPA, 2006). In Swiss teenagers, smoking prevalence increased until 2002, and began to decrease only thereafter (Schmid, Delgrande Jordan, Kuntsche, Kuendig, & Annaheim, 2007). To our knowledge there are no published data on change during the past decade in smoking prevalence or cigarette consumption in Geneva specifically.

If screening and brief clinical interventions for smoking cessation were provided to 90% of adults, this would have the same impact, in terms of life years saved, as increasing to 90% the delivery rate of all the following clinical preventive services combined: influenza vaccine in adults, aspirin chemoprophylaxis, screening for colorectal, breast and cervical cancers,

and screening for problem drinking (Maciosek et al., 2006). However, screening and brief clinical interventions for smoking are provided to one third of patients only (Humair & Ward, 1998; Maciosek et al., 2006). Whether the frequency of brief clinical advice for smoking cessation increased over the past decade in Switzerland is not documented.

Thus, the aim of this study was to assess change between 1996 and 2006 in smoking prevalence, cigarette consumption, motivation to quit smoking, quit attempts, and smoking cessation advice received from physicians.

2. Material and methods

We conducted two mail surveys in cross-sectional, representative samples of the general population of Geneva, an urban canton in French-speaking Switzerland. The intended samples included 1000 people in 1996 and 2000 people in 2006, aged 18–70 (Etter, 2009b). The samples were drawn at random from the publicly available part of the population register. This register includes 86% of the population and excludes the personnel of the United Nations, diplomats, elected politicians, and people who asked not to be listed. Both surveys were approved by the ethics committee at the University of Geneva.

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Table 1
Smoking behaviour, 1996–2006, by sex, Geneva, Switzerland.

	All			Men			Women		
	1996	2006	<i>p</i>	1996	2006	<i>p</i>	1996	2006	<i>p</i>
Ever been a regular cigarette smoker (≥ 1 cig./day for ≥ 6 months) (% yes)	53.0	52.1	0.71	61.1	54.5	0.046	45.9	49.2	0.31
Smoked at least one cigarette in the last 6 months (% yes)	37.4	37.7	0.89	36.2	36.2	0.12	29.7	39.0	0.07
Smoked for ≥ 1 day in past 30 days (%)	–	32.6	–	–	33.2	–	–	32.0	–
Are you currently a cigarette smoker? (% yes)	28.0	26.5	0.46	32.2	26.7	0.04	22.9	26.0	0.34
Former smokers (ever smoked but not currently a smoker)	24.0	26.8	0.85	26.8	28.8	0.09	21.6	24.3	0.47
Ever smokers: age started smoking regularly (i.e. ≥ 1 cig./day) (median)	17.0	17.0	0.52	17.0	17.0	0.11	18.0	17.0	0.008
<i>Among cigarette smokers</i>									
Cigarettes per day (mean)	16.5	13.9	0.004	18.4	14.9	0.003	14.1	12.7	0.25
Cigarettes per day (median)	15.0	13.0	0.003	20.0	15.0	0.003	12.0	10.0	0.26
Smoke ≤ 10 cig./day (%)	36.0	44.2	0.032	27.2	37.3	0.049	46.6	53.2	0.24
Minutes to first cigarette of the day, after waking up (% within 5 minutes)	8.4	7.9	0.97	13.4	10.4	0.90	5.5	7.4	0.87
Heaviness of Smoking Index (score 0–6, mean)	1.9	1.7	0.18	2.2	1.9	0.16	1.6	1.5	0.69
Sure that you could quit smoking if you decided to? (% very + fairly sure)	34.0	46.3	<0.001	36.7	53.3	<0.001	42.3	46.3	<0.001
Seriously thinks of stopping smoking in the next 6 months (% yes)	29.1	39.6	0.045	34.2	34.6	0.62	22.7	46.2	<0.001
Intends to quit smoking within the next 30 days (% yes)	8.9	11.8	0.75	7.9	10.1	0.97	9.1	13.9	0.43
Made a 24-hour attempt to quit in past 12 months (%)	22.2	28.6	0.52	25.4	29.5	0.96	18.2	27.7	0.27

2.1. Questionnaires

Participants indicated whether they had ever been regular smokers (at least 1 cig./day during at least 6 months), whether they had smoked at least 1 cigarette in the previous 6 months, and whether they were current cigarette smokers. Ever smokers indicated the age when they started to smoke daily, former smokers indicated the date when they had stopped smoking, and smokers indicated the number of cigarettes they smoked per day and the minutes to their first cigarette of the day. Tobacco dependence was assessed with the Heaviness of Smoking Index (Etter, Duc, & Perneger, 1999). In 2006, participants indicated the number of days when they smoked in the previous 30 days. In 1996 and 2006, smokers were asked: "During your last medical visit, did the doctor tell you that you should stop smoking" and "...offer you help to stop smoking?" (Yes, No, I don't remember). The questionnaire also covered age, sex, household income and school years.

2.2. Analyses

We used chi-square tests to compare proportions, *t* tests to compare means in 2 groups, ANOVA *F* tests to compare means in more than 2 groups, Mann–Whitney *U* tests to compare medians in 2 groups and Kruskal–Wallis tests to compare medians in more than 2 groups.

3. Results

3.1. Participation

We collected 742 questionnaires in 1996 (75.2% of 987 valid addresses) and 1487 in 2006 (76.5% of 1945 valid addresses). Participants were 42.3 years old on average in 1996 and 41.0 years in 2006 ($p=0.015$), the proportion of men was 48.0% in 1996 and 55.0% in 2006 ($p<.001$), and the average number of school years was 13.4 in 1996 and 15.3 in 2006 ($p<.001$).

3.2. Smoking prevalence and cigarette consumption

There was no significant change in the proportion of current smokers between 1996 (28.0%, 95% confidence interval: 24.7–31.3%) and 2006 (26.5%; 95% confidence interval: 24.3–28.7%, $p=0.46$), or in the proportion of people who had smoked ≥ 1 cigarette in the previous 6 months. Between 1996 and 2006, there was a decrease in the proportions of ever smokers (i.e., ever smoked ≥ 1 cig./day during

≥ 6 months) among men, but no change among women. There was no significant change between 1996 and 2006 in the proportions of former smokers (Table 1). The proportion of smokers was highest in 18–25 years old men, half of whom (47.1%) were smokers.

We observed a decrease in smoking prevalence among men (Table 1), but this change was observed only among men aged 26–45 years (from 42.4% in 1996 to 28.5% in 2006, $p=0.001$). In women, overall, there was no statistically significant change in smoking prevalence, but we observed a substantial increase in smoking prevalence in women aged over 55 years (from 11.6% in 1996 to 26.1% in 2006, $p=0.013$). Among women, between 1996 and 2006, there was a decrease of one year in the median age at initiation of daily smoking (Table 1). This change was not due to a decrease in the age at smoking initiation in young women, but rather to a generation effect, as in 2006, compared with 1996, there were fewer women of the older generation who had begun to smoke at a later age.

The association between smoking prevalence and income/school years was stronger in 2006 than in 1996, reflecting a growing social gap (Table 2). In 2006, the association between education and smoking prevalence was observed only in men ($\chi^2=16.4$, $p=0.001$) and not in women ($\chi^2=2.3$, $p=0.5$). Among ex-smokers, there was no change between 1996 and 2006 in the age at smoking cessation (33.2 years in 1996, 31.8 years in 2006, $p=0.79$), in either men (35.1 vs. 32.0 years, $p=0.74$) or women (29.1 vs. 31.3 years, $p=0.82$).

Among smokers, we observed a decrease in daily cigarette consumption, from 15 cig./day in 1996 to 13 cig./day in 2006 ($p=0.003$). This decrease was statistically significant in men only, but not in women (Table 1). The decrease over time in cigarette consumption was significant in the highest category of income and education only (Table 2). In 2006, among smokers, the most educated smoked one third fewer cigarettes per day than the less educated, whereas no such difference was observed in 1996 (Table 2). However, the decrease in cigarette consumption did not imply a reduction in the

Table 2
Smoking prevalence and cigarette consumption, 1996–2006, by school years.

School years	Current smokers (%)			Cig./day, in smokers		
	1996	2006	<i>p</i>	1996	2006	<i>p</i>
0–12 years	30.6	31.5	0.88	16.2	15.0	0.71
13–15 years	26.5	30.1	0.46	12.0	12.0	0.37
16–17 years	23.6	24.1	1.0	12.0	10.0	0.29
≥ 18 years	19.6	21.9	0.68	20.0	10.0	0.033
χ^2 , <i>F</i> , <i>p</i>	$\chi^2=5.0$ $p=0.17$	$\chi^2=12.7$ $p=0.005$		$F=0.50$ $p=0.68$	$F=5.6$ $p=0.001$	

level of dependence, as measured by minutes to the first cigarette or by the Heaviness of Smoking Index (Table 1).

Among smokers, the proportion of 'low rate' smokers of ≤ 10 cig./day increased between 1996 and 2006, and this change was statistically significant in men only. In 2006, among smokers, one third of the men and half the women smoked ≤ 10 cig./day (Table 1).

3.3. Quit attempts, motivation to quit

There was no change between 1996 and 2006 in the proportion of smokers who made a 24-hour quit attempt in the previous 12 months (Table 1). In 2006, one fourth of current smokers made a 24-hour quit attempt, and each of these unsuccessful quitters made 2 quit attempts (median) in the previous year. The proportion of smokers reporting that they intended to stop smoking in the next 6 months increased in the whole sample and in women, but remained unchanged in men (Table 1). Intention to stop smoking in the next 6 months remained unchanged in subgroups defined by income or school years, but increased in people ≥ 40 years old (from 30.2% in 1996 to 46.6% in 2006, $\chi^2 = 4.7$, $p = 0.03$).

3.4. Smoking cessation advice received from physicians

In 2006, 27.3% of smokers reported that, during their last medical visit, their physician told them they should stop smoking (1996: 29.2%, $p = 0.38$), and 13.3% of smokers reported that their doctor offered them help to stop smoking (1996: 15.1%, $p = 0.29$).

4. Discussion

4.1. Smoking prevalence

Smoking prevalence remained stable between 1996 and 2006 in Geneva, despite the substantial rise in tobacco prices (OFSP, 2007), and the increased frequency of smoking bans (Etter, 2009a). However, we observed a decrease in prevalence among men aged 26 to 45 years, and an increase in women over 55 years. In women, this change was explained by an aging effect of the cohort of women born before 1940 who seldom smoked, as there were fewer women in this age group in 2006 than in 1996. The reduction in prevalence in men aged 26–45 years could be the result of tobacco control policies, but it is not clear why these policies had an impact in this group only. Among smokers, there was a reduction in the number of cigarettes smoked per day, but no reduction in the degree of dependence, suggesting that the level of exposure to smoke did not change. The reduction in cig./day was probably due to the substantial price increase during these 10 years: as the price of the best-selling pack (20 cigarettes Marlboro) rose by 62%, from CHF 3.70 in 1996 to CHF 6.00 in 2006 (OFSP, 2007). Interestingly, the reduction in cigarette consumption was observed only in smokers with the highest levels of income and education, and we also observed a growing social gap in smoking prevalence between 1996 and 2006, perhaps because the most educated were more receptive to prevention interventions. Prevention programs targeted at the less educated and less affluent smokers should receive priority.

Our results contrast with two Swiss surveys, which showed a decrease in smoking prevalence among adults between 1997 (33.2%) and 2007 (27.9%) for one survey (OFS, 2008a), and between 2001 (33%) and 2007 (29%) for the other (Keller, Krebs, & Hornung, 2008). It is possible that the trend observed in Switzerland does not apply to the urban, French-speaking canton of Geneva, or that differences in the methods used explain this discrepancy. However, the confidence intervals around our estimates are compatible with a possible decrease in smoking prevalence.

In smokers, one third of the men and half the women smoked 10 or fewer cigarettes per day. This result is in agreement with Swiss data showing that 45% of smokers smoke fewer than 10 cig./day (OFS, 2008a).

In the U.S. too, most smokers currently smoke < 15 cig./day (CDC, 2007). Because almost all medication trials (nicotine therapy, bupropion, and varenicline) excluded smokers of fewer than 10–15 cig./day, the efficacy of these treatments in light smokers is largely undocumented (Cahill, Stead, & Lancaster, 2008; Stead, Perera, Bullen, Mant, & Lancaster, 2008). Excluding these smokers from treatment trials is problematic, as they represent an increasing part of the smoking population. The mortality rate in smokers of 1–14 cig./day is 51% higher than in non-smokers (Doll, Peto, Boreham, & Sutherland, 2004), and interventions should be developed that take into account the specificities of these smokers (Etter, 2004b).

In populations where smoking prevalence is low, smokers tend, on average, to be less dependent on tobacco, more motivated to quit smoking and more likely to try to quit (Etter, 2004a; Etter, Perneger, & Ronchi, 1997). We could not test whether these variables changed simultaneously over time, because our data suggest that during the past decade in Geneva, smoking prevalence, dependence levels and the frequency of quit attempts remained stable.

4.2. Physicians

Screening and brief advice on tobacco dependence is one of the three most cost-effective medical interventions (Solberg, Maciosek, Edwards, Khanchandani, & Goodman, 2006). However, doctors seldom advised or helped smokers to quit, and this situation did not change between 1996 and 2006. More should be done to educate physicians on this topic, and systems change is necessary, including reimbursement of smoking cessation treatments (Fiore, 2008).

4.3. Study limitations and strengths

The response rates were relatively high for mail surveys in the general population (Asch, Jedrzejewski, & Christakis, 1997), but one quarter of the intended sample did not answer. The existence and direction of a possible non-response bias are difficult to establish (Etter & Perneger, 1997). On the other hand, this study is original in that it provides information not available elsewhere. It complements data from the Swiss Health Survey and the Tobacco Monitoring, which are not published in the peer-reviewed literature (Keller et al., 2008; OFS, 2008b), and in Geneva, the Bus Santé, which includes only people aged over 35 (Morabia, Costanza, Bernstein, & Rielle, 2002).

4.4. Conclusions

Between 1996 and 2006 in Geneva, smoking prevalence decreased in men but did not change overall, and we observed a growing social gap in smoking prevalence and cigarette consumption. Interventions targeting the less educated and the less affluent smokers should be implemented at population level (Huisman, Kunst, & Mackenbach, 2005a,b). Interventions in clinical settings should also be emphasized, including systems changes.

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Contributors

JF Etter designed the study, wrote the protocol, collected the data, conducted the statistical analysis and wrote the manuscript.

Conflict of Interest

The author declares that he has no conflicts of interest.

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