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Factors associated with cessation of smoking among Swiss adults between 1991 and 2011: results from the SAPALDIA cohort

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Summary

INTRODUCTION: Smoking is still the most preventable cause of disease and premature death in Switzerland, as elsewhere. We aimed to assess the main determinants of smoking cessation in the population-based cohort of SAPALDIA (Swiss Cohort Study on Air Pollution and Lung and Heart Diseases in Adults).

METHODS: The SAPALDIA study was initiated in 1991 with 9651 participants aged 18 to 60 years from eight areas (S1). Follow-up assessments were conducted in 2002 (S2; 8047 participants) and 2010/11 (S3; 6088 participants). At each survey, detailed information on health and potential health-related factors was collected and lung function measured. Using logistic regression, we assessed predictors of smoking cessation between S1 and S2 and between S2 and S3.

RESULTS: In both periods, highest educational level (summary odds ratio [OR] 1.49, 95% confidence interval [CI] 1.08–2.06; ref. lowest level), FEV1/FVC <0.5 (OR 6.19, 95% CI 2.44–15.7, ref. FEV1/FVC ≥0.7), higher age in men (OR 1.02, 95% CI 1.01–1.03, per year) and overweight (OR 1.38, 95% CI 1.16–1.64) were significant predictors of smoking cessation. Nicotine dependence (OR 0.97, 95% CI 0.96–0.98, per cigarette smoked a day) and female sex between age 45 and 60 (e.g., OR 0.74, 95% CI 0.61–0.91, at age 50) were negatively associated with smoking cessation. Moreover, smokers at S2 reporting a diagnosis of depression were less likely to quit smoking by S3 (OR 0.53, 95% CI 0.30–0.93).

CONCLUSIONS: Prospective tobacco control policies in Switzerland should be addressed to women, younger persons and persons of lower education.

Key words: *smoking cessation, factors associated with smoking cessation, COPD and smoking cessation, smoking cessation in Switzerland, SAPALDIA cohort*

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Introduction

The fight against the tobacco epidemic is a global health priority. During the 20th century, tobacco smoking killed about 100 million people and this number is likely to reach 1 billion in the 21st century [1]. Despite numerous international tobacco control efforts, smoking is still a top ranking cause of disease and premature death [2]. Six million people per year die as a consequence of tobacco use, more

ABBREVIATIONS

BMI	body mass index
COPD	chronic obstructive pulmonary disease
ETS	environmental tobacco smoke
FEV1	forced expiratory volume in 1 second
FVC	forced vital capacity
GOLD	Global Initiative for Chronic Obstructive Lung Disease
NRT	nicotine replacement therapy
SAPALDIA	Swiss Cohort Study on Air Pollution and Lung and Heart Diseases in Adults
S1	SAPALDIA 1
S2	SAPALDIA 2
S3	SAPALDIA 3
WHO	World Health Organization
YLL	years of life lost

than 600 000 of them as a result of exposure to second-hand smoke [3].

In Switzerland, more than 9000 deaths were attributable to smoking in 2007 according to the Federal Office of Statistics. A quarter of these deaths involved persons under the age of 65 years and a higher proportion were men. The three leading causes of smoking-attributable death were cancer (41%), cardiovascular disease (41%) and respiratory diseases (18%) [4]. Additionally, environmental tobacco smoke exposure in public places in Switzerland was estimated to cause 32 000 additional hospital days and 3000 YLL (years of life lost) owing to lung cancer and ischaemic heart disease per year. This corresponds to healthcare costs of 330 million Swiss francs [5].

Recent data from the Swiss national health survey point to a decreasing trend in smoking prevalence in both sexes and most age groups [6]. According to national and international evidence, the most effective measures for tobacco control at the population level are structural prevention measures, such as cigarette pricing and legislation against smoking in public and work places or against advertisement [1, 7]. Switzerland was late in responding to international calls for tobacco control and is one of the few countries that have not yet ratified the World Health Organization (WHO) tobacco convention. In 2016, the health committee of the Swiss parliament voted against the prohibition of tobacco advertisement in public places and movie theatres. All European Union member states have in the meantime implemented such laws. Switzerland has, however, increased tobacco taxes and restricted smoking in public and work places in more recent years. A nationwide smoking ban in public places was enforced in 2010. However, less is known about personal factors influencing the likelihood of smoking cessation.

Educational level has been identified as an important predictor of quitting among smokers in Switzerland and the European Union [6, 8]. However, health variables have not been well studied as predictors of cessation among Swiss smokers [6]. Research on these factors can help to tailor prevention strategies for further reduction of the burden of tobacco use. The aims of this study were to assess changes in smoking prevalence and predictors of smoking cessation between 1991 and 2010/11 in the population-based cohort of SAPALDIA (which covers culturally and geographically diverse regions of Switzerland) with a specific focus on the role of sociodemographic, lifestyle and health-related factors.

Materials and methods

This study used data from SAPALDIA, a population-based multicentre cohort study initiated in 1991 with the objective of studying effects of air pollution on respiratory health in adults. The SAPALDIA study was conducted in eight different areas of Switzerland (Aarau, Basel, Davos, Geneva, Lugano, Montana, Payerne and Wald). Members of the SAPALDIA team are listed in appendix 1. Participants aged 18–60 years at the onset were recruited through random samples drawn from the respective inhabitant registries. The baseline survey (S1) included 9651 participants. Later, two follow-up assessments were conducted, one in 2002 (S2; 8047 participants) and the second one in 2010/11 (S3; 6088 participants).

At each assessment of the SAPALDIA cohort, detailed information about general health, life-style and living conditions was collected by means of an extensive computer-based interview at the study centre. In the second and third survey, self-administered questionnaires and telephone interviews were additionally used. Pulmonary function of study participants was measured in all three surveys. The lung function parameters assessed were FVC (forced vital capacity), FEV1 (forced expiratory volume in the first second) and various forced expiratory flow measures. The FEV1/FVC ratio was calculated for every subject and a low ratio (defined as <0.7) was considered an indicator of obstruction to air flow in accordance with the GOLD report definition of Chronic Obstructive Pulmonary Disease (COPD) [9]. The SAPALDIA methodology has been described in detail [10, 11]. All participants gave written informed consent and ethical approval was granted by the Swiss Academy of Medical Sciences and the respective cantonal ethics committees.

Study population

For the purpose of this study, two samples were chosen. The first sample consisted of all smokers at SAPALDIA1 with smoking status known at SAPALDIA2 and sufficient covariate information at SAPALDIA1 and the second sample contained all smokers at SAPALDIA2 with smoking status known at SAPALDIA3 plus sufficient covariate information at SAPALDIA2 (see section on statistical analysis).

Outcome variables

The outcome variables were “smoking cessation between S1 and S2” in the sample of smokers in SAPALDIA1 and “smoking cessation between S2 and S3” in the sample of smokers in SAPALDIA2. Subjects who reported being smokers at the beginning of the respective period and nonsmokers at the end were assigned the value 1 in these variables and will be referred to as quitters.

Being a smoker was defined by a positive answer to both of the following questions: “Have you ever smoked for as long as a year?” “Do you now smoke, as of one month ago?”

Statistical analysis

The proportions of smokers and nonsmokers were assessed for each of the three surveys according to age, sex, study area, educational level, nationality and marital status. Predictors of smoking cessation were studied by using a multivariable logistic regression model with the outcome “having quitted between respective surveys”. In order to minimise the risk of confounding of main results and to be open to new findings, the selection of independent variables was broad and limited only by data availability.

All independent variables were defined on the basis of their values at the beginning of the respective follow-up period. The first model included variables assessed both at S1 and S2, i.e., sex, age, study area, education level (low = primary school; medium = secondary school, middle school or apprenticeship; high = college or university’), civil status (married; divorced; widowed; single), nationality (Swiss; Italian, Spanish or Portuguese; western and northern Europe; eastern Europe; others), smoking intensity (measured by the daily number of cigarettes smoked),

overweight (defined by a body mass index >25 kg/m^2), level of environmental tobacco smoke exposure (none; less than 3 hours a day; at least 3 hours a day), asthma (defined by the question "Did you ever have asthma and was this asthma confirmed by a doctor?"), chronic cough (defined by the question "Do you usually cough during the day or at night, on most days for as much as 3 months each year, and for at least two years?"), chronic phlegm (defined by the question "Do you usually bring up any phlegm from your chest during the day or at night, on most days for as much as 3 months each year, and for at least two years?"), and level of chronic obstructive pulmonary disease (FEV1/FVC ≥0.7, 0.5 ≤FEV1/FVC <0.7, FEV1/FVC <0.5). This model was applied to smoking cessation between S1 and S2 among smokers at S1 (i.e., with predictor variables assessed at S1) and to smoking cessation between S2 and S3 among smokers at S2 (i.e., with the same predictor variables updated at S2). Estimates of both models were then combined using fixed effects meta-analysis. In a second step, the model for smoking cessation between S2 and S3 was extended by the following additional predictor variables only assessed at S2: alcohol consumption ("less than once a week"; "less than once a day"; "once or two times a day"; "three times or more per day"); physical activity ("sufficiently active" = at least 150 min/week of moderate or vigorous activity vs "insufficiently active" = less than 150 min/week of moderate or vigorous activity); an indicator variable for "new dog ownership" (i.e., reported dog ownership in S2 but not in S1); separate indicator variables for self-reported doctor's diagnoses of diabetes, cancer and depression; an indicator variable for cardiovascular disease defined as presence of heart disease, hypertension or stroke, with heart disease having been defined based on prescribed medications (beta-blockers, angiotensin converting-enzyme [ACE] inhibitors, calcium channel blockers or diuretics). In a third model, we additionally included the eight indices of the SF36 questionnaire on self-perceived, health-related quality of life, representing the domains vitality, physical functioning, bodily pain, general health perceptions, physical role functioning, emotional role functioning, social role functioning and mental health [12]. As these variables may be on the causal pathway between chronic diseases and the decision to quit smoking, they were not included from the beginning. As FEV1/FVC is the lung function measure used to define chronic obstructive pulmonary disease (COPD), also known as "smoker's disease", we explored the functional relationship between FEV1/FVC at S1 and the likelihood of quitting smoking between S1 and S2, using a natural cubic spline function.

Effect modification by sex was assessed using interaction terms. Gender-specific analyses were also conducted and their results are presented in supplementary tables S6 and S7 (appendix 2). As the interaction between sex and age had a p-value <0.1, effects of age were estimated separately for men and women. To address potential bias due to loss to follow-up, analyses were also performed using inverse probability weighting. Probability weights for the analysis of smoking cessation between two consecutive surveys were derived from logistic regression models of participation in the second of the two surveys as a function of variables from the first of the two surveys which were informative about further participation. The level of statistical significance was defined at 0.05 for main effects and at 0.1 for interaction effects. All analyses were conducted in Stata 13.1 (Stata Corp., College Station, USA).

Results

Characteristics of smokers and non-smokers over the time of follow-up

The sociodemographic characteristics of smokers and non-smokers are shown in table 1. Similar patterns were observed in all three surveys. Current smoking was more prevalent in men, persons aged between 30 and 50 years, persons with low education or of non-Swiss nationality, and divorced persons. Moreover, smoking was most prevalent in Payerne, Basel, Lugano and Geneva.

Overall, the proportion of current smokers declined among most age groups and areas between S1 and S3. Moreover, the prevalence of current smoking decreased for both men (from 38% in S1 to 20% in S3) and women (from 29% in S1 to 17% in S3). However, the prevalence of current smoking was higher in males than in females in all three surveys. The proportion of current smokers also decreased between S1 and S3 across all educational levels (most strongly among persons with medium education, with 33% in S1 and 19% in S3), nationalities (most strongly among Swiss persons, with 33% in S1 and 18% in S3) and categories of civil status (most strongly among married persons with 31% in S1 and 15% in S3). Smoking prevalence remained highest in the lowest educational group, in divorced participants, and in non-Swiss nationals.

Predictors of smoking cessation between S1 and S3

Table 2 shows the odds ratios of smoking cessation between S1 and S2 among smokers at S1 for predictor variables from S1 (first column) and of smoking cessation between S2 and S3 among smokers at S2 for the same variables re-assessed at S2 (second column). The meta-analytic summary estimates of the period-specific results are shown in the third column of the table. The characteristics of the respective samples are given in supplementary table S1 (appendix 2). Statistically significant predictors of quitting after meta-analysis of period-specific results were "being overweight" (odds ratio [OR] 1.38, 95% confidence interval [CI] 1.16–1.64), "being in the highest education category" (OR 1.49, 95% CI 1.08–2.06, ref. lowest category), "being widowed" (OR 2.21, 95% CI 1.29–3.76, ref. married), "being divorced" (OR 1.35, 95% CI 1.04–1.76, ref. married) and "having a Tiffeneau ratio FEV1/FVC <0.5" (OR 6.19, 95% CI 2.44–15.7, ref. FEV1/FVC ≥0.7). Age showed a significant positive association with quitting (OR 1.02, 95% CI 1.01–1.03, per year of age) in men, whereas no association with age was found in women. In contrast, women between age 45 (OR 0.79, 95% CI 0.66–0.95) and age 60 (OR 0.63, 95% CI 0.47–0.84) and smokers with a higher daily consumption of cigarettes (OR 0.97, 95% CI 0.96–0.98 per cigarette) were significantly less likely to quit. Smokers with chronic cough (OR 0.94, 95% CI 0.69–1.27), chronic phlegm (OR 0.77, 95% CI 0.51–1.16) or asthma (OR 0.77, 95% CI 0.54–1.08) were also less likely to quit. No significant differences were found according to area or nationality. Some associations got considerably stronger in the second period. Both high and medium as compared to low education became sig-

nificant predictors of smoking cessation, with odds ratios above 2.5 in both cases. Moreover, smokers with asthma were significantly less likely to quit than those who did not report having asthma. On the other hand, the gender difference decreased.

Additional predictors of smoking cessation between S2 and S3

The multivariable logistic regression analysis relating characteristics of smokers newly assessed at S2 to smoking cessation between S2 and S3 was performed in two consecutive regression models, the first one without and the second one including the SF36 variables. Both models also included the variables listed in table 2. The results of the first model are given in table 3.

Smokers reporting depression at S2 were significantly less likely to quit smoking by S3 (OR 0.53, 95% CI 0.30–0.93) than those who did not report this disease. Compared with smokers drinking alcohol less than once a week, the likelihood of smoking cessation by S3 was significantly lower among those drinking alcohol once or twice a day (OR 0.64, 95% CI 0.42–0.96).

In contrast, smokers with cardiovascular disease at S2 (OR 1.54, 95% CI 1.05–2.28) or having become owners of a dog between S1 and S2 (OR 1.78, 95% CI 1.12–2.83) were significantly more likely to quit smoking. A history of cancer was also a positive albeit not significant predictor of quitting by S3 (OR 1.54, 95% CI 0.79–2.99). Associations of smoking cessation between S2 and S3 with the variables re-assessed at S2 showed similar odds ratios with and without adjustment for the variables newly assessed in S2, and patterns of statistical significance were identical (supplementary table S2 in appendix 2).

A further analysis studying the relationship between smoking cessation and the Tiffeneau ratio FEV_1/FVC was performed (fig. 1). The probability of quitting showed a U-shaped dependency on the FEV1/FVC ratio with highest probabilities of quitting at the two ends of the spectrum. However, the most important finding was that the probabil-

Table 3: Estimated independent associations of smoking cessation between SAPALDIA2 (2002) and SAPALDIA3 (2010/11) with different personal characteristics newly introduced in SAPALDIA2[1].

	Odds ratio	(95% CI)
Alcohol consumption		
Less than once a week	1	
Less than once a day	0.94	(0.66–1.34)
1 or 2 times a day	0.64*	(0.42–0.96)
≥3 times a day	2.18	(0.88–5.43)
Physical Activity		
Insufficiently active	1	
Sufficiently active[2]	0.98	(0.73–1.32)
New dog ownership[3]	1.78*	(1.12–2.83)
Diabetes[4]	0.99	(0.42–2.31)
Cancer[4]	1.54	(0.79–2.99)
Depression[4]	0.53*	(0.30–0.93)
Cardiovascular disease[5]	1.54*	(1.05–2.28)

[1] Results from multivariable logistic regression model (among persons who were smokers at SAPALDIA2) with outcome = "having quit smoking by SAPALDIA3" and covariates defined at SAPALDIA2. The model included all variables listed in the table along with sex, age, study area, education level, civil status, nationality, overweight, mean daily duration of environmental tobacco smoke exposure, daily number of cigarettes smoked, presence of chronic cough, presence of chronic phlegm, doctor's diagnosed asthma and Tiffeneau ratio (FEV1/FVC). [2] At least 150min/week of moderate or vigorous physical activity [3] Reported ownership of a dog in SAPALDIA2 but not yet in SAPALDIA1. [4] Diagnosed by a doctor [5] Hypertension, stroke and/or intake of heart medication * p <0.05

Table 1: Characteristics of the cohort at the three surveys of SAPALDIA in 1991, 2002 and 2010/11 by smoking status.

	SAPALDIA 1 (1991)				SAPALDIA 2 (2002)				SAPALDIA 3 (2010/11)			
	Nonsmokers		Smokers		Nonsmokers		Smokers		Nonsmokers		Smokers	
Characteristic	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Total	6410	66	3232	34	5906	74	2116	26	4896	81	1113	19
Age (years)												
<30	1275	64	719	36	43	75	14	25	0	0	0	0
30–40	1461	62	888	38	975	69	438	31	194	82	42	18
40–50	1837	66	945	34	1296	68	623	32	886	76	277	24
>50	1837	73	680	27	3592	78	1041	22	3816	83	794	17
Sex												
Male	2918	62	1822	38	2717	71	1137	30	2285	80	581	20
Female	3492	71	1410	29	3189	77	979	23	2611	83	532	17
Educational Level												
≤9 years of school	1028	63	595	37	509	73	189	27	320	80	78	20
12 years of school	4276	67	2117	33	3799	73	1442	28	3171	81	759	19
College or university	1092	68	514	32	1593	77	484	23	1403	84	276	17
Nationality												
Swiss	5318	67	2572	33	5071	74	1765	26	4314	82	943	18
Italian, Spanish, Portuguese	684	60	448	40	514	71	213	29	332	77	100	23
W & N European	245	65	132	35	207	71	86	29	167	76	53	24
Eastern European	69	64	38	36	43	65	23	35	28	78	8	22
Others	86	69	39	31	65	75	22	25	48	89	6	11
Civil status												
Married	4238	69	1898	31	3554	77	1050	23	2893	85	524	15
Divorced	340	54	288	46	394	66	207	34	458	74	159	26
Widowed	124	72	49	28	239	80	59	20	298	87	43	13
Single	1703	63	996	37	736	69	324	31	518	77	149	22

ity of quitting increased with increasing degree of obstruction among COPD patients.

The last model of smoking cessation between S2 and S3 included the eight scores derived from the SF-36 questionnaire by which participants assessed their health-related quality of life (table S3, appendix 2). The introduction of these scores had no sizable influence on the associations of quitting with the disease variables or other predictors of smoking cessation considered. Only two out of eight scores of the SF-36 survey showed a significant association with quitting. These associations are shown in a forest plot (fig. 2).

Smokers with a low energy and vitality index were significantly more likely to quit smoking (OR 2.03, 95% CI 1.12–3.68, ref. high energy and vitality index). In contrast, persons with a lower social functioning score were less likely to quit (OR 0.63, 95% CI 0.39–1.03, ref. high social functioning).

Results obtained upon inverse probability weighting were very similar to the original ones (tables S4 and S5, appendix 2).

Discussion

The findings of our study are consistent with results from the Swiss Health Survey, which documented a decrease in smoking prevalence from the early nineties to about 2010 in Switzerland [6, 13]. However, in our study the decrease was faster, which is partly explained by the stronger loss to follow-up among smokers in our cohort, but possibly also by the fact that our cohort aged by 20 years and therefore no longer includes the youngest age groups. The percentage of smokers was 19% in our cohort in 2010/11, whereas the corresponding figure was 28% in the National Health Survey in 2012. However, there is strong evidence that smoking has not decreased among young Swiss adults in the last decade [13]. If the percentage of smokers is computed for adults aged 35 years or more (i.e., roughly corresponding to the age range of our cohort in the third survey) using data of the Swiss National Health Survey, the estimated percentage of smokers in 2012 reduces to 25%.

Across the three surveys of SAPALDIA in 1991, 2002 and 2010/11, both genders showed an increasing proportion

Table 2: Estimated independent associations of smoking cessation between surveys with different personal characteristics[1].

	1991–2002		2002–2010/11		1991–2010/11	
	Odds ratio	**(95% CI)**	**Odds ratio**	**(95% CI)**	**Odds ratio**	**(95% CI)**
Sex (at 50 years)						
Men	1		1		1	
Women	0.64*	(0.49–0.85)	0.88	(0.65–1.17)	0.74*	(0.61–0.91)
Age (years)						
In men	1.02*	(1.01–1.04)	1.02*	(1.00–1.04)	1.02*	(1.01–1.03)
In women	1.00	(0.98–1.01)	1.01	(0.99–1.03)	1.00	(0.99–1.01)
Civil status						
Married	1.00		1.00		1.00	
Divorced	1.42*	(1.01–2.01)	1.26	(0.83–1.90)	1.35*	(1.04–1.76)
Widowed	2.21*	(1.08–4.54)	2.20	(0.99–4.87)	2.21*	(1.29–3.76)
Single	1.17	(0.91–1.49)	1.31	(0.90–1.89)	1.21	(0.98–1.48)
Education level[2]						
Low	1.00		1.00		1.00	
Medium	1.04	(0.78–1.37)	2.75*	(1.30–5.82)	1.17	(0.90–1.52)
High	1.31	(0.92–1.86)	2.94*	(1.33–6.49)	1.49*	(1.08–2.06)
Nationality						
Swiss	1.00		1.00		1.00	
Italian, Spanish, Portuguese	1.00	(0.72–1.39)	0.85	(0.50–1.44)	0.96	(0.72–1.26)
W & N European	0.80	(0.49–1.31)	0.86	(0.43–1.71)	0.82	(0.55–1.22)
Eastern European	0.73	(0.20–2.67)	1.62	(0.46–5.75)	1.10	(0.45–2.72)
Other	1.82	(0.69–4.76)	0.60	(0.11–3.32)	1.39	(0.60–3.22)
Overweight[3]	1.38*	(1.11–1.71)	1.38*	(1.03–1.84)	1.38	(1.16–1.64)
No. cigarettes / day	0.97*	(0.97–0.98)	0.95*	(0.94–0.97)	0.97*	(0.96, 0.98)
Daily ETS exposure[4]						
None	1.00		1.00		1.00	
<3 hrs	1.07	(0.84–1.36)	1.01	(0.73–1.39)	1.05	(0.86–1.27)
≥3 hrs	0.86	(0.69–1.07)	1.05	(0.72–1.55)	0.90	(0.74–1.10)
Chronic cough[5]	0.96	(0.66–1.39)	0.88	(0.51–1.52)	0.94	(0.69–1.27)
Chronic phlegm[5]	0.89	(0.53–1.48)	0.59	(0.30–1.18)	0.77	(0.51–1.16)
Asthma[6]	0.94	(0.62–1.43)	0.49*	(0.26–0.91)	0.77	(0.54–1.08)
FEV1/FVC ratio[7]						
≥0.7	1.00		1.00		1.00	
0.5–0.7	1.10	(0.82–1.47)	0.99	(0.70–1.39)	1.05	(0.84–1.31)
<0.5	3.86	(0.93–16.0)	8.87*	(2.57–30.6)	6.19*	(2.44–15.7)

[1] Results for the periods 1991 (SAPALDIA1) – 2002 (SAPALDIA2) and 2002 – 2010 / 11 (SAPALDIA3) are from multivariable logistic regression models (among persons who were smokers at the start of the period) with outcome = "having quit smoking by the end of the period" and covariates including study area and all variables listed in the table (as assessed at the beginning of the period). Results for the entire period 1991 – 2010/11 were obtained as meta-analytic summary estimates of the period-specific results. [2] Low = ≤9 years of school; medium = 12 years of school; high = college or university [3] Body mass index >25 kg/m^2 [4] Mean duration of daily exposure to environmental tobacco smoke [5] Regular occurrence of respective symptom for ≥3 months per year and since at least 2 years [6] Confirmed by a doctor [7] FVC = forced vital lung capacity, FEV1 = forced expiratory volume in one second * p <0.05

of former smokers and a decreasing prevalence of current smoking. This trend was previously reported in another Swiss study [6], as well as in other countries such as Spain [14], the UK and Australia [15]. Overall, men had a higher proportion of current smokers over time than women, but the sex difference decreased over time. Our findings of a decreasing smoking trend in both men and women with a slower decrease rate among women are in agreement with other studies in high-income countries [14–17], where this is described as a consequence of the later adoption of smoking as a widespread habit by women. Reasons for this time lag include multiple sociocultural factors such as social disapproval of female smoking in the early twentieth century, gender role norms, less employment among females and a higher religious commitment in women [18]. Possible causes of this closing gap between females and males, recently described in the WHO bulletin [19], include increasing societal tolerance toward smoking women [15], growing economic resources among women and the tobacco industry's targeting of women by featuring smoking as a symbol of independence and social desirability [20, 21].

Figure 1: Estimated probability of quitting smoking between 1991 and 2002 as a function of FEV1/FVC in 1991, with 95% confidence limits*.[1] Defined according to the GOLD report definition*derived from a logistic regression model of smoking cessation between 1991 and 2002 containing a natural cubic spline function of baseline FEV1/FVC and adjusting for age, sex, study area, civil status, educational level, nationality, BMI, parental smoking, exposure to environmental tobacco smoke, number of cigarettes smoked per day and presence of respiratory conditions (chronic cough, chronic phlegm and asthma) at baseline

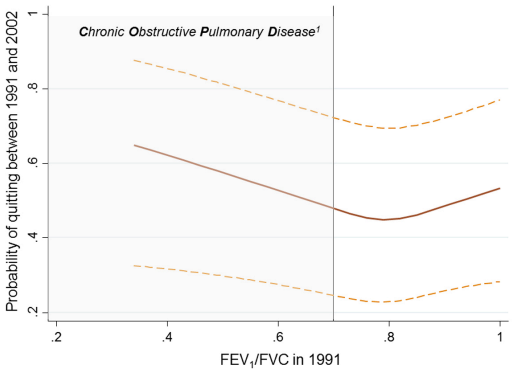
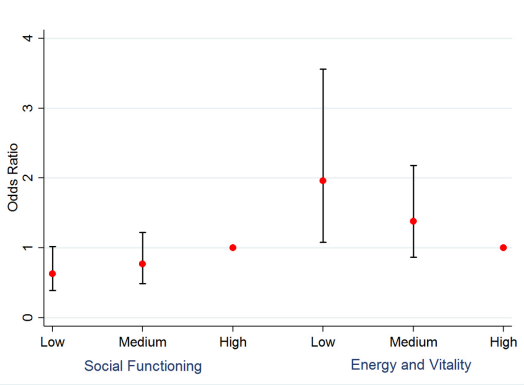


Figure 2: Smoking cessation between 2002 and 2010/11 and quality of life in 2002.SF36 index categories: low <25, medium ≥25/<75, high ≥75.Odds ratios of smoking cessation between SAPALDIA2 (2002) and SAPALDIA3 (2010/11) associated with SF36-scores of "social functioning" and "energy and vitality" are adjusted for age, sex, study area, civil status, educational level, nationality, BMI, exposure to environmental tobacco smoke, number of cigarettes smoked per day, alcohol consumption, physical activity, new dog ownership, presence of chronic cough, chronic phlegm and asthma, depression, diabetes, cardiovascular disease, cancer and pulmonary function. There was no evidence of any association between smoking cessation and the other SF36-scores.



Sociodemographic and lifestyle predictors of quitting

Our findings indicate that higher educational level, being divorced or widowed and age in men are significant predictors of smoking cessation. These results are consistent with those of previous research in Switzerland [6, 22] Europe [8, 23, 24], and the USA [25], where higher odds of quitting were linked to male gender, aging, higher education, marital status and higher socioeconomic status.

That overweight smokers were more likely to quit was unexpected. A similar finding was made in two European cohort studies, of which the first was conducted in Germany, where the cessation rate increased significantly with increasing BMI [26], and the second in Ireland where having a BMI ≥25 kg/m^2 was positively associated with quitting [27]. In contrast, a study conducted in the USA [28] reported a lower cessation rate among overweight persons and explained this by concerns about gaining weight expressed by overweight smokers, particularly women.

New dog ownership as a positive predictor of quitting was another unanticipated finding. Although there is some evidence that having a pet can motivate healthy behaviour changes [29, 30], this finding would need to be confirmed by other studies.

In contrast, the likelihood of quitting was lower in women and decreased with increasing number of cigarettes smoked per day, an indicator of dependency. Multiple studies have found that heavier smokers are more likely to continue smoking in the long term [8, 11, 24, 31]. This negative relation between nicotine dependence and smoking cessation may be used as a basis for a personalised approach to nicotine replacement therapy (NRT). For example, a previous study in twins showed that 40 to 60% of the individual differences in the ability to quit smoking and, to some extent also the propensity for nicotine dependence, are genetically determined [32]. As a consequence, the effectiveness of NRT could be improved by differentiating the dose of nicotine replacement according to the level of dependency and the genotype of the smoker [33].

We additionally performed an analysis looking at the probability of quitting before S1. Interestingly, patients with asthma and women were more likely to quit before SAPALDIA 1, suggesting that persons from these two groups who were still smoking at the baseline survey had increased nicotine dependency. This might provide another explanation for the negative association of these two characteristics with quitting.

Health-related predictors of smoking cessation

Among the health-related variables included in our study, cardiovascular disease and severe airway obstruction showed a positive association with quitting, whereas persons with asthma, chronic phlegm or depression were less likely to quit. A negative association between smoking

cessation and chronic sputum production was also found in a recent smoking cessation intervention study conducted among 887 smoking employees in the city of Basel [34].

The coexistence of smoking and depression has been extensively investigated, mainly because depression is the psychiatric disorder most associated with tobacco use [35]. Similar to our results, the aforementioned intervention study in Basel showed that smokers with a history of depression or current use of antidepressants were less likely to quit [34]. This may be related to common genetic mechanisms behind smoking initiation, nicotine dependence and depressive disorders [36, 37].

According to the European Respiratory Society-Task force guidelines, respiratory patients who smoke are a difficult target group for smoking cessation, as they tend to minimise their own perceived risk of disease. Even in advanced stages of COPD, when quality of life is low, a smoking patient could consider cigarettes as an important factor for his/her quality of life [38]. Therefore, these patients need strong encouragement and continued counselling support for overcoming their addiction [39].

Our data on the health-related quality of life assessed with the SF-36 questionnaire showed that current smokers with a lower vitality score had a higher probability of quitting, whereas those with a lower social functioning score were less likely to quit. This is consistent with the results of previous studies, where persons who continued smoking had lower social functioning scores than those who quitted smoking [40, 41]. Moreover, a higher number of cigarettes smoked per day has been significantly associated with a lower vitality score [40, 42], possibly reflecting impaired physical health. However, in our study the association was observed after adjusting for chronic diseases and even in a sensitivity analysis where we excluded the participants with chronic diseases (data not shown).

Swiss smoking bans and smoking cessation

The decrease in smoking prevalence between SAPALDIA 2 and SAPALDIA 3 could also be related to the introduction of smoking bans at the cantonal level. However, we could not assess the impact of these smoke-free laws because of the shortness of the follow-up time after the implementation of the bans and the imprecise information on the quitting age of many study subjects.

Strengths and limitations

Our study is based on a large multi-regional population sample, which was followed up over 20 years, and from which an extensive database on sociodemographic, environmental, lifestyle and health characteristics of the study participants could be established. The large number of different predictor variables considered is both a strength and a limitation of the study. It reduces the risk of confounding, but increases alpha error inflation. Loss to follow-up, which is common in long-term cohort studies, is a limitation. To address this concern, we performed inverse probability weighting involving predictor variables of follow-up participation. This led to only minor changes in the observed associations. Although this does not rule out the presence of some remaining bias, it makes major attrition bias less likely. Although the SAPALDIA study includes local populations from urban and rural communities and from the three major language regions of Switzerland, the present results may not be fully generalisable to the adult population of Switzerland, as study areas were not selected randomly. Moreover, as the cohort aged during follow-up, our results cannot be generalised to younger adults. Another limitation is the self-report of smoking status. But self-reported smoking status was shown to have good validity in several population based studies [43, 44] and we had found end-expiratory carbon monoxide measurements in SAPALDIA2 to discriminate well between quitters and non-quitters in the first follow-up period, with an area under the receiver-operating-characteristic curve of 0.91.

Conclusion

Our data confirm the decrease in smoking prevalence in Switzerland over the period 1991 to 2011. Our findings regarding individual characteristics associated with smoking cessation are relevant tools for personalised approaches in tobacco control at the policy and at the personal level, as they point to subgroups in need for additional support such as pharmacological treatment of nicotine addiction. Prospective public health policies against tobacco use in Switzerland should be particularly focused to women, younger persons and persons of lower education. Persons with respiratory problems, depression or signs of high nicotine dependence need personalised support.

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Disclosure statement

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References

1 Jha P. Avoidable global cancer deaths and total deaths from smoking. Nat Rev Cancer. 2009;9(9):655–64. doi: http://dx.doi.org/10.1038/nrc2703. PubMed.

2 Jha P, Peto R. Global effects of smoking, of quitting, and of taxing tobacco. N Engl J Med. 2014;370(1):60–8. doi: http://dx.doi.org/10.1056/NEJMra1308383. PubMed.

3 WHO. | WHO global report on trends in tobacco smoking 2000-2025 [Internet]. WHO. [cited 2015 Sep 28]. Available from: http://www.who.int/entity/tobacco/publications/surveillance/reporton-trendsto baccosmoking/en/index.html

4 Smoking-attributable mortality [Internet]. 2012 [cited 2015 Sep 28]. Available from:http://www.bfs.admin.ch/bfs/portal/en/index/themen/14/02/04/dos/03.htm

5 Hauri DD, Lieb CM, Rajkumar S, Kooijman C, Sommer HL, Röösli M. Direct health costs of environmental tobacco smoke exposure and indirect health benefits due to smoking ban introduction. Eur J Public Health. 2011;21(3):316–22. doi: http://dx.doi.org/10.1093/eurpub/ckq142. PubMed.

6 Marques-Vidal P, Cerveira J, Paccaud F, Cornuz J. Smoking trends in Switzerland, 1992-2007: a time for optimism? J Epidemiol Community Health. 2011;65(3):281–6. doi: http://dx.doi.org/10.1136/jech.2009.099424. PubMed.

7 Chaloupka FJ, Straif K, Leon ME; Working Group, International Agency for Research on Cancer. Effectiveness of tax and price policies in tobacco control. Tob Control. 2011;20(3):235–8. doi: http://dx.doi.org/10.1136/tc.2010.039982. PubMed.

8 Bosdriesz JR, Willemsen MC, Stronks K, Kunst AE. Socioeconomic inequalities in smoking cessation in 11 European countries from 1987 to 2012. J Epidemiol Community Health. 2015;69(9):886–92. doi: http://dx.doi.org/10.1136/jech-2014-205171. PubMed.

9 Global Strategy for the Diagnosis, Management and Prevention of COPD, Global Initiative for Chronic Obstructive Lung Disease (GOLD). 2016 [Internet]. Available from: http://www.goldcopd.org/

10 Martin BW, Ackermann-Liebrich U, Leuenberger P, Künzli N, Stutz EZ, Keller R, et al. SAPALDIA: methods and participation in the cross-sectional part of the Swiss Study on Air Pollution and Lung Diseases in Adults. Soz Praventivmed. 1997;42(2):67–84. doi: http://dx.doi.org/10.1007/BF01318136. PubMed.

11 Ackermann-Liebrich U, Kuna-Dibbert B, Probst-Hensch NM, Schindler C, Felber Dietrich D, Stutz EZ, et al., SAPALDIA Team. Follow-up of the Swiss Cohort Study on Air Pollution and Lung Diseases in Adults (SAPALDIA 2) 1991-2003: methods and characterization of participants. Soz Praventivmed. 2005;50(4):245–63. doi: http://dx.doi.org/10.1007/s00038-005-4075-5. PubMed.

12 Ware JE, Jr, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. Med Care. 1992;30(6):473–83. doi: http://dx.doi.org/10.1097/00005650-199206000-00002. PubMed.

13 Tobacco [Internet]. 2014 [cited 2016 May 25]. Available from: http://www.bfs.admin.ch/bfs/portal/en/index/themen/14/02/02/key/03.html

14 Villalbí JR, Rodríguez-Sanz M, Villegas R, Borrell C. [Changes in the population smoking patterns: Barcelona, 1983-2006]. Med Clin (Barc). 2009;132(11):414–9. Article in Spanish. PubMed.

15 Amos A. Women and smoking. Br Med Bull. 1996;52(1):74–89. doi: http://dx.doi.org/10.1093/oxfordjournals.bmb.a011534. PubMed.

16 Lopez AD, Collishaw NE, Piha T. A descriptive model of the cigarette epidemic in developed countries. Tob Control. 1994;3(3):242–7. doi: http://dx.doi.org/10.1136/tc.3.3.242.

17 Mackay DF, Gray L, Pell JP. Impact of smoking and smoking cessation on overweight and obesity: Scotland-wide, cross-sectional study on 40,036 participants. BMC Public Health. 2013;13(1):348. doi: http://dx.doi.org/10.1186/1471-2458-13-348. PubMed.

18 Waldron I. Patterns and causes of gender differences in smoking. Soc Sci Med. 1991;32(9):989–1005. doi: http://dx.doi.org/10.1016/0277-9536(91)90157-8. PubMed.

19 Hitchman SC, Fong GT. Gender empowerment and female-to-male smoking prevalence ratios. Bull World Health Organ. 2011;89(3):195–202. doi: http://dx.doi.org/10.2471/BLT.10.079905. PubMed.

20 Amos A, Haglund M. From social taboo to "torch of freedom": the marketing of cigarettes to women. Tob Control. 2000;9(1):3–8. doi: http://dx.doi.org/10.1136/tc.9.1.3. PubMed.

21 Richmond R. You've come a long way baby: Women and the tobacco epidemic. Addiction. 2003;98(5):553–7. doi: http://dx.doi.org/10.1046/j.1360-0443.2003.00342.x. PubMed.

22 Marti J. Successful smoking cessation and duration of abstinence--an analysis of socioeconomic determinants. Int J Environ Res Public Health. 2010;7(7):2789–99. doi: http://dx.doi.org/10.3390/ijerph7072789. PubMed.

23 Nagelhout GE, de Korte-de Boer D, Kunst AE, van der Meer RM, de Vries H, van Gelder BM, et al. Trends in socioeconomic inequalities in smoking prevalence, consumption, initiation, and cessation between 2001 and 2008 in the Netherlands. Findings from a national population survey. BMC Public Health. 2012;12(1):303. doi: http://dx.doi.org/10.1186/1471-2458-12-303. PubMed.

24 Osler M, Prescott E. Psychosocial, behavioural, and health determinants of successful smoking cessation: a longitudinal study of Danish adults. Tob Control. 1998;7(3):262–7. doi: http://dx.doi.org/10.1136/tc.7.3.262. PubMed.

25 Hyland A, Li Q, Bauer JE, Giovino GA, Steger C, Cummings KM. Predictors of cessation in a cohort of current and former smokers followed over 13 years. Nicotine Tob Res. 2004;6(6, Suppl 3):S363–9. doi: http://dx.doi.org/10.1080/14622200412331320761. PubMed.

26 Twardella D, Loew M, Rothenbacher D, Stegmaier C, Ziegler H, Brenner H. The impact of body weight on smoking cessation in German adults. Prev Med. 2006;42(2):109–13. doi: http://dx.doi.org/10.1016/j.ypmed.2005.11.008. PubMed.

27 McGorrian C, Lonergan M, Kelleher C, Daly L, Fitzpatrick P. Predictors of Successful Smoking Cessation in a Family Practice-Based Cardiovascular Risk Factor Intervention Program: "Real-World" Experience From the Heartwatch Program. J Smok Cessat. 2010;5(02):151–7. doi: http://dx.doi.org/10.1375/jsc.5.2.151.

28 Levine MD, Bush T, Magnusson B, Cheng Y, Chen X. Smoking-related weight concerns and obesity: differences among normal weight, overweight, and obese smokers using a telephone tobacco quitline. Nicotine Tob Res. 2013;15(6):1136–40. doi: http://dx.doi.org/10.1093/ntr/nts226. PubMed.

29 Headey B, Grabka MM. Pets and Human Health in Germany and Australia: National Longitudinal Results. Soc Indic Res. 2007;80(2):297–311. doi: http://dx.doi.org/10.1007/s11205-005-5072-z.

30 Hodgson K, Barton L, Darling M, Antao V, Kim FA, Monavvari A. Pets' Impact on Your Patients' Health: Leveraging Benefits and Mitigating Risk. J Am Board Fam Med. 2015;28(4):526–34. doi: http://dx.doi.org/10.3122/jabfm.2015.04.140254. PubMed.

31 Nordstrom BL, Kinnunen T, Utman CH, Krall EA, Vokonas PS, Garvey AJ. Predictors of continued smoking over 25 years of follow-up in the normative aging study. Am J Public Health. 2000;90(3):404–6. doi: http://dx.doi.org/10.2105/AJPH.90.3.404. PubMed.

32 Xian H, Scherrer JF, Madden PAF, Lyons MJ, Tsuang M, True WR, et al. The heritability of failed smoking cessation and nicotine withdrawal in twins who smoked and attempted to quit. Nicotine Tob Res. 2003;5(2):245–54. doi: http://dx.doi.org/10.1080/1462220031000073667. PubMed.

33 Rose JE, Behm FM, Drgon T, Johnson C, Uhl GR. Personalized smoking cessation: interactions between nicotine dose, dependence and quit-success genotype score. Mol Med. 2010;16(7-8):247–53. doi: http://dx.doi.org/10.2119/molmed.2009.00159. PubMed.

34 Stolz D, Scherr A, Seiffert B, Kuster M, Meyer A, Fagerström K-O, et al. Predictors of success for smoking cessation at the workplace: a longitudinal study. Respiration. 2014;87(1):18–25. doi: http://dx.doi.org/10.1159/000346646. PubMed.

35 Hughes JR. Comorbidity and smoking. Nicotine Tob Res. 1999;1(1, Suppl 2):S149–52, discussion S165–6. doi: http://dx.doi.org/10.1080/14622299050011981. PubMed.

36 Sullivan PF, Kendler KS. The genetic epidemiology of smoking. Nicotine Tob Res. 1999;1(1, Suppl 2):S51–7, discussion S69–70. doi: http://dx.doi.org/10.1080/14622299050011811. PubMed.

37 Tsuang MT, Francis T, Minor K, Thomas A, Stone WS. Genetics of smoking and depression. Hum Genet. 2012;131(6):905–15. doi: http://dx.doi.org/10.1007/s00439-012-1170-6. PubMed.

38 Tønnesen P, Carrozzi L, Fagerström KO, Gratziou C, Jimenez-Ruiz C, Nardini S, et al. Smoking cessation in patients with respiratory diseases: a high priority, integral component of therapy. Eur Respir J. 2007;29(2):390–417. doi: http://dx.doi.org/10.1183/09031936.00060806. PubMed.

39 Rigotti NA, Clair C, Munafò MR, Stead LF. Interventions for smoking cessation in hospitalised patients. Cochrane Database Syst Rev. 2012;5(5):CD001837. PubMed.

40 Sarna L, Bialous SA, Cooley ME, Jun H-J, Feskanich D. Impact of smoking and smoking cessation on health-related quality of life in women in the Nurses' Health Study. Qual Life Res. 2008;17(10):1217–27. doi: http://dx.doi.org/10.1007/s11136-008-9404-8. PubMed.

41 Mulder I, Tijhuis M, Smit HA, Kromhout D. Smoking cessation and quality of life: the effect of amount of smoking and time since quitting. Prev Med. 2001;33(6):653–60. doi: http://dx.doi.org/10.1006/pmed.2001.0941. PubMed.

42 Guitérrez-Bedmar M, Seguí-Gómez M, Gómez-Gracia E, Bes-Rastrollo M, Martínez-González MA. Smoking status, changes in smoking status and health-related quality of life: findings from the SUN ("Seguimiento Universidad de Navarra") cohort. Int J Environ Res Public Health. 2009;6(1):310–20. doi: http://dx.doi.org/10.3390/ijerph6010310. PubMed.

43 Vartiainen E, Seppälä T, Lillsunde P, Puska P. Validation of self reported smoking by serum cotinine measurement in a community-based study. J Epidemiol Community Health. 2002;56(3):167–70. doi: http://dx.doi.org/10.1136/jech.56.3.167. PubMed.

44 Rebagliato M. Validation of self reported smoking. J Epidemiol Community Health. 2002;56(3):163–4. doi: http://dx.doi.org/10.1136/jech.56.3.163. PubMed.

Appendix 1

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Appendix 2

Supplementary tables

Table S1: Description of the samples included in the analyses of smoking cessation.

	Sample 1[1] (n = 2245)		Sample 2[1] (n = 1075)	
	Count	**%**	**Count**	**%**
Age				
<30 yrs	512	22.8	7	0.7
30–40 yrs	634	28.2	226	21
40–50 yrs	656	29.2	353	32.8
>50 yrs	443	19.7	489	45.5
Sex				
Male	1175	52.3	560	52.1
Female	1070	47.7	515	47.9
Civil status				
Married	1334	59.4	693	64.5
Divorced	182	8.1	143	13.3
Widowed	35	1.6	32	3
Single	694	30.9	207	19.3
Educational Level[2]				
Low	364	16.2	54	5
Medium	1536	68.4	735	68.4
High	345	15.4	286	26.6
Nationality				
Swiss	1883	83.9	923	85.9
Italian, Spanish, Portuguese	238	10.6	89	8.3
Western & northern European	91	4	45	4.2
Eastern European	15	0.7	11	1
Other	18	0.8	7	0.7
Overweight[3]	690	30.7	494	46
No. cigarettes per day, median (IQR)	15	(8, 20)	12	(5, 20)
Daily ETS exposure[4]				
None	922	41.1	552	51.4
<3 hrs	518	23.1	323	30
≥3 hrs	805	35.9	200	18.6
Chronic cough[5]	187	8.3	102	9.5
Chronic phlegm[5]	92	4.1	69	6.4
Asthma[6]	121	5.4	73	6.8
FEV1/FVC ratio [7]				
≥0.7	1945	86.6	807	75.1
0.5–0.7	291	13	254	23.6
<0.5	9	0.4	14	1.3
Cardiovascular disease[8]			176	16.4
Diabetes[6]			17	1.6
Cancer[6] (n = 1074)			47	4.4
Depression[6]			88	8.2
New dog ownership[9]			107	10
Suffcient physical activity (n = 1072) [10]			694	64.7
Alcohol consumption (n = 1073)				
Less than once a week			256	23.9
Less than once a day			502	46.8
1–2 times per day			282	26.3
≥3 times per day			33	3.1

[1] Sample 1 = smokers at SAPALDIA1 (1991) with known smoking status at SAPALDIA2 (2002) and complete information on age to Tiffeneau ratio at SAPALDIA1; Sample 2 = smokers at SAPALDIA2 (2002) with known smoking status at SAPALDIA3 (2010/11) and complete information on variables Age to Tiffeneau ratio in SAPALDIA2. [2] Low = ≤ 9 years of school; medium = 12 years of school; high = college or university [3] Body mass index >25 kg/m^2 [4] Mean duration of daily exposure to environmental tobacco smoke [5] regular occurrence of respective symptom for ≥3 months per year and since at least 2 years [6] Confirmed by a doctor [7] FVC = forced vital lung capacity, FEV1 = forced expiratory volume in one second [8] Hypertension, stroke and/or intake of heart medication [9] Reported ownership of a dog in SAPALDIA2 but not yet in SAPALDIA1 [10] At least 150 min/week of moderate or vigorous physical activity

Table S2: Estimated independent associations of smoking cessation between SAPALDIA2 (2002) and SAPALDIA3 (2010/11) with different personal characteristics assessed at SAPALDIA2[1], comparison of basic and extended model.

	Extended model[2]		Basic model[2]	
Characteristic	**Odds ratio**	**(95% CI)**	**Odds Ratio**	**(95% CI)**
Sex (at 50 years)				
Male	1		1	
Female	0.86	(0.63–1.18)	0.88	(0.65–1.17)
Age (years)				
In men	1.02	(1.00–1.04)	1.02*	(1.00–1.04)
In women	1.01	(0.99–1.03)	1.01	(0.99–1.03)
Civil status				
Married	1		1.00	
Divorced	1.36	(0.89–2.08)	1.26	(0.83–1.90)
Widowed	2.68*	(1.19–6.06)	2.20	(0.99–4.87)
Single	1.42	(0.97–2.07)	1.31	(0.90–1.89)
Educational level[3]				
Low	1		1.00	
Medium	2.63*	(1.22–5.66)	2.75*	(1.30–5.82)
High	2.91*	(1.29–6.58)	2.94*	(1.33–6.49)
Nationality				
Swiss	1		1.00	
Italian, Spanish, Portuguese	0.74	(0.43–1.29)	0.85	(0.50–1.44)
W & N European	0.92	(0.46–1.84)	0.86	(0.43–1.71)
Eastern European	1.62	(0.44–5.94)	1.62	(0.46–5.75)
Other	0.44	(0.08–2.52)	0.60	(0.11–3.32)
Overweight[4]	1.36*	(1.01–1.84)	1.38*	(1.03–1.84)
No. of cigarettes/day	0.95*	(0.94–0.96)	0.95*	(0.94–0.97)
Daily ETS exposure[5]				
None	1		1.00	
<3 hours	1.00	(0.72–1.39)	1.01	(0.73–1.39)
≥3 hours	0.98	(0.66–1.46)	1.05	(0.72–1.55)
Chronic cough[6]	0.92	(0.53–1.60)	0.88	(0.51–1.52)
Chronic phlegm[6]	0.54	(0.26–1.10)	0.59	(0.30–1.18)
Asthma[7]	0.52*	(0.28–0.96)	0.49*	(0.26–0.91)
FEV1/FVC ratio [8]				
≥0.7	1		1.00	
0.5–0.7	0.94	(0.66–1.33)	0.99	(0.70–1.39)
<0.5	10.75***	(3.05–37.9)	8.87*	(2.57–30.6)
Alcohol consumption				
Less than once a week	1			
Less than once a day	0.94	(0.66–1.34)		
1 or 2 times a day	0.64*	(0.42–0.96)		
≥3 times a day	2.18	(0.88–5.43)		
Physical Activity[9]				
Insufficiently active	1			
Sufficiently active	0.98	(0.73–1.32)		
New dog ownership[10]	1.78*	(1.12–2.83)		
Diabetes[11]	0.99	(0.42–2.31)		
Cancer[11]	1.54	(0.79–2.99)		
Depression[11]	0.53*	(0.30–0.93)		
Cardiovascular disease[12]	1.54*	(1.05–2.28)		

[1] Results from multivariable logistic regression model (among persons who were smokers at SAPALDIA2) with outcome = "having quit smoking by SAPALDIA3" and covariates defined at SAPALDIA2. [2] Basic model includes covariates which were already assessed in SAPALDIA1: sex, age, study area. education level, civil status, nationality, overweight, mean daily duration of ETS-exposure, daily number of cigarettes smoked, presence of chronic cough, presence of chronic phlegm, doctor's diagnosed asthma and Tiffeneau ratio (FEV1/FVC). Extended model additionally includes variables introduced in SAPALDIA2. [3] Low = ≤9 years of school; medium = 12 years of school; high = college or university [4] Body mass index >25 kg/m^2 [5] Mean duration of daily exposure to environmental tobacco smoke [6] Regular occurrence of respective symptom for ≥3 months per year and for at least 2 years [7] confirmed by a doctor [8] FVC = forced vital lung capacity, FEV1 = forced expiratory volume in one second [9] At least 150 min/week of moderate or vigorous physical activity [10] Reported ownership of a dog in SAPALDIA2 but not in SAPALDIA1. [11] diagnosed by a doctor [12] Hypertension, stroke and/or intake of heart medication * p <0.05

Table S3: Estimated independent associations of smoking cessation between SAPALDIA2 (2002) and SAPALDIA3 (2010/11) with indicators of health related quality of life (SF36) assessed at SAPALDIA2 (n = 880)[1].

	Odds ratio	(95% CI)
Health Status (SF-36 questionnaire)		
SF36 Pain	1.00	(0.99–1.01)
SF36 general health perceptions	1.00	(0.99–1.02)
SF36 mental health	0.99	(0.98–1.01)
SF36 physical functioning	1.00	(0.99–1.01)
SF36 role-emotional	1.01	(1.00–1.01)
SF36 role-physical	1.00	(0.99–1.00)
SF36 Social Functioning[2]		
Low	0.63	(0.39–1.03)
Medium	0.78	(0.50–1.24)
High	1	Ref.
SF36 Energy and Vitality[2]		
Low	2.03*	(1.12–3.68)
Medium	1.41	(0.89–2.22)
High	1	
Adjustment variables		
Sex (at 50 years)		
Male	1	
Female	0.78	(0.54–1.12)
Age (years)		
In men	1.02	(1.00–1.04)
In women	1.01	(0.98–1.03)
Civil status		
Married	1	
Divorced	1.54	(0.96–2.47)
Widowed	2.65*	(1.04–6.78)
Single	1.57*	(1.02–2.40)
Educational level		
Low	1	
Medium	2.3	(0.96–5.52)
High	2.81*	(1.12–7.07)
Nationality		
Swiss	1	
Italian, Spanish, Portuguese	0.55	(0.29–1.06)
W & N European	0.78	(0.34–1.79)
Eastern European	2.16	(0.37–12.58)
Other	0.35	(0.06–2.05)
Overweight	1.37	(0.97–1.93)
No. of cigarettes per day	0.95*	(0.94–0.97)
Alcohol consumption		
Less than once a week	1	
Less than once a day	0.94	(0.62–1.41)
1 or 2 times a day	0.60*	(0.37–0.96)
≥3 times a day	1.50	(0.54–4.18)
Physical Activity		
Insufficiently active	1	
Sufficiently active	0.84	(0.60–1.17)
New dog ownership	1.76*	(1.06–2.92)
Daily ETS exposure		
None	1	
<3 hours	1.10	(0.76–1.60)
≥3 hours or more	1.08	(0.69–1.69)
Chronic cough	1.00	(0.55–1.81)
Chronic phlegm	0.69	(0.32–1.51)
Asthma	0.51	(0.24–1.07)
FEV1/FVC ratio		
≥0.7	1	
0.5–0.7	0.92	(0.62–1.36)
<0.5	11.0*	(2.26–52.9)
Diabetes	0.87	(0.33–2.25)
Cancer	1.87	(0.82–4.29)

	Odds ratio	(95% CI)
Depression	0.58	(0.29–1.17)
Cardiovascular disease	1.83*	(1.17–2.86)

[1] Results from multivariable logistic regression model (among persons who were smokers at SAPALDIA2) with outcome = "having quit smoking by SAPALDIA3" and covariate part consisting of study area and all variables listed in the table. [2] low = score <25; medium = 25 ≤score <75; high = score ≥75

Table S4: Estimated independent associations of smoking cessation between SAPALDIA1 (1991) and SAPALDIA2 (2002) with different personal characteristics assessed at SAPALDIA1, without and with inverse probability weighting (IPW).

	Without IPW		With IPW	
Characteristic	**Odds ratio**	**(95% CI)**	**Odds ratio**	**(95% CI)**
Sex (at 50 years)				
Male	1		1	
Female	0.64*	(0.49–0.85)	0.63*	(0.48–0.84)
Age (years)				
In men	1.02*	(1.01–1.04)	1.02*	(1.01–1.04)
In women	0.99	(0.98–1.01)	0.99	(0.98–1.01)
Civil status				
Married	1		1	
Divorced	1.43*	(1.01–2.01)	1.45*	(1.03–2.06)
Widowed	2.21*	(1.08–4.54)	2.16*	(1.09–4.26)
Single	1.16	(0.91–1.49)	1.19	(0.93–1.51)
Educational level[2]				
Low	1		1	
Medium	1.04	(0.78–1.37)	1.06	(0.80–1.40)
High	1.31	(0.92–1.86)	1.33	(0.93–1.90)
Nationality				
Swiss	1		1	
Italian, Spanish, Portuguese	1.00	(0.72–1.39)	0.98	(0.70–1.38)
W & N European	0.80	(0.49–1.31)	0.81	(0.50–1.32)
Eastern European	0.73	(0.20–2.67)	0.64	(0.13–3.12)
Other	1.82	(0.69–4.76)	1.84	(0.65–5.26)
Overweight[3]	1.38*	(1.11–1.71)	1.36*	(1.09–1.70)
No. of cigarettes/day	0.97*	(0.97–0.98)	0.98*	(0.97–0.99)
Daily ETS exposure[4]				
None	1		1	
<3 hours	1.07	(0.84–1.36)	1.07	(0.84–1.37)
≥3 hours	0.86	(0.69–1.07)	0.88	(0.70–1.11)
Chronic cough[5]	0.96	(0.66–1.39)	0.95	(0.65–1.37)
Chronic phlegm[5]	0.89	(0.53–1.48)	0.91	(0.54–1.55)
Asthma[6]	0.94	(0.62–1.43)	0.90	(0.58–1.40)
FEV1/FVC ratio[7]				
≥0.7	1		1	
0.5–0.7	1.10	(0.82–1.47)	1.15	(0.85–1.55)
<0.5	3.86	(0.93–15.95)	4.41*	(1.03–18.9)

[1] Results from multivariable logistic regression models (among persons who were smokers at SAPALDIA1) with outcome = "having quit smoking by SAPALDIA2" and covariate part consisting of study area and all variables listed in the table. Probability weights were derived from a logistic regression model for the outcome "participation in SAPALDIA2" involving variables from SAPALDIA1 associated with participation in SAPALDIA2. [2] Low = ≤9 years of school; medium = 12 years of school; high = college or university [3] Body mass index >25 kg/m^2 [4] Mean duration of daily exposure to environmental tobacco smoke [5] Regular occurrence of respective symptom for ≥3 months per year and for at least 2 years [6] Confirmed by a doctor [7] FVC = forced vital lung capacity, FEV1 = forced expiratory volume in one second

Table S5: Estimated independent associations of smoking cessation between SAPALDIA2 (2002) and SAPALDIA3 (2010/11) with different personal characteristics assessed at SAPALDIA2, without and with inverse probability weighting (IPW).

	Without IPW		With IPW	
Characteristic	**Odds ratio**	**(95% CI)**	**Odds ratio**	**(95% CI)**
Sex (at 50 years)				
Male	1		1	
Female	0.78	(0.54-1.12)	0.78	(0.55-1.12)
Age (years)				
In men	1.02	(1.00-1.04)	1.02	(1.00-1.04)
In women	1.01	(0.98-1.03)	1.00	(0.98-1.03)
Civil status				
Married	1		1	
Divorced	1.54	(0.96-2.47)	1.48	(0.92-2.38)
Widowed	2.65*	(1.04-6.78)	2.90*	(1.17-7.17)
Single	1.57*	(1.02-2.40)	1.62*	(1.06-2.47)
Educational level[2]				
Low	1		1	
Medium	2.3	(0.96-5.52)	2.09	(0.90-4.86)
High	2.81*	(1.12-7.07)	2.57*	(1.04-6.36)
Nationality				
Swiss	1		1	
Italian, Spanish, Portuguese	0.55	(0.29-1.06)	0.56	(0.29-1.07)
W & N European	0.78	(0.34-1.79)	0.74	(0.32-1.72)
Eastern European	2.16	(0.37-12.58)	2.65	(0.41-16.96)
Other	0.35	(0.06-2.05)	0.34	(0.06-2.07)
Overweight[3]	1.37	(0.97-1.93)	1.36	(0.96-1.91)
No. of cigarettes/day	0.95*	(0.94-0.97)	0.96*	(0.94-0.97)
Daily ETS exposure[4]				
None	1		1	
<3 hours	1.10	(0.76-1.60)	1.13	(0.77-1.66)
≥3 hours	1.08	(0.69-1.69)	1.08	(0.69-1.70)
Chronic cough[5]	1.00	(0.55-1.81)	1.00	(0.53-1.89)
Chronic phlegm[5]	0.69	(0.32-1.51)	0.70	(0.33-1.49)
Asthma[6]	0.51	(0.24-1.07)	0.50	(0.25-1.01)
FEV1/FVC ratio[7]				
≥0.7	1		1	
0.5–0.7	0.92	(0.62-1.36)	0.94	(0.63-1.41)
<0.5	10.95*	(2.26-52.9)	8.06*	(1.14-56.9)
Alcohol consumption				
Less than once a week	1		1	
Less than once a day	0.94	(0.62-1.41)	0.92	(0.61-1.41)
1 or 2 times a day	0.60*	(0.37-0.96)	0.58*	(0.36-0.94)
≥ 3 times a day	1.50	(0.54-4.18)	1.35	(0.53-3.48)
Physical Activity				
Insufficiently active	1		1	
Sufficiently active[8]	0.84	(0.60-1.17)	0.86	(0.61-1.19)
New dog ownership[9]	1.76*	(1.06-2.92)	1.69*	(1.01-2.82)
Diabetes[10]	0.87	(0.33-2.25)	1.01	(0.36-2.83)
Cancer[10]	1.87	(0.82-4.29)	1.95	(0.85-4.49)
Depression[10]	0.58	(0.29-1.17)	0.58	(0.30-1.14)
Cardiovascular disease[11]	1.83*	(1.17-2.86)	1.95*	(1.23-3.09)
Health Status (SF-36 survey)				
SF36 Pain	1.00	(0.99-1.01)	1.00	(0.99-1.01)
SF36 general health perceptions	1.00	(0.99-1.02)	1.00	(0.99-1.02)
SF36 mental health	0.99	(0.98-1.01)	0.99	(0.98-1.01)
SF36 physical functioning	1.00	(0.99-1.01)	1.00	(0.99-1.01)
SF36 role-emotional	1.01	(1.00-1.01)	1.00	(1.00-1.01)
SF36 role-physical	1.00	(0.99-1.00)	1.00	(0.99-1.00)
SF36 Social Functioning[12]				
Low	0.62	(0.39-1.03)	0.60*	(0.37-0.97)
Medium	0.78	(0.50-1.24)	0.74	(0.47-1.17)
High	1		1	
SF36 Energy and Vitality[12]				
Low	2.03*	(1.12-3.68)	2.02*	(1.11-3.68)

	Without IPW		With IPW	
Characteristic	**Odds ratio**	**(95% CI)**	**Odds ratio**	**(95% CI)**
Medium	1.41	(0.89-2.22)	1.39	(0.88-2.21)
High	1		1	

[1] Results from multivariable logistic regression models (among persons who were smokers at SAPALDIA2) with outcome = "having quit smoking by SAPALDIA3" and covariate part consisting of study area and all variables listed in the table. Probability weights were derived from a logistic regression model for the outcome "participation in SAPALDIA3" involving variables from SAPALDIA2 associated with participation in SAPALDIA3. [2] Low = ≤9 years of school; medium = 12 years of school; high = college or university [3] Body mass index >25 kg/m^2 [4] Mean duration of daily exposure to environmental tobacco smoke [5] Regular occurrence of respective symptom for ≥3 months per year and for at least 2 years [6] Confirmed by a doctor [7] FVC = forced vital lung capacity, FEV1 = forced expiratory volume in one second [8] At least 150 min/week of moderate or vigorous physical activity [9] Reported ownership of a dog in SAPALDIA2 but not in SAPALDIA1. [10] Diagnosed by a doctor [11] Hypertension, stroke and/or intake of heart medication [12] low = score <25; medium = 25 ≤score <75; high = score ≥75 * p < 0.05

Table S6: Estimated independent associations of smoking cessation between SAPALDIA1 (1991) and SAPALDIA2 (2002) with different personal characteristics assessed at SAPALDIA1, by gender.

	Men		Women	
Characteristic	**Odds ratio**	**(95% CI)**	**Odds ratio**	**(95% CI)**
Age (years)	1.02*	(1.00–1.03)	1.00	(0.98–1.01)
Civil status				
Married	1		1	
Divorced	2.34*	(1.36–4.03)	1.12	(0.70–1.80)
Widowed			2.03	(0.93–4.41)
Single	1.08	(0.75–1.55)	1.24	(0.88–1.76)
Educational level[2]				
Low	1		1	
Medium	1.06	(0.71–1.60)	1	(0.67–1.49)
High	1.44	(0.89–2.31)	1.06	(0.60–1.86)
Nationality				
Swiss	1		1	
Italian, Spanish, Portuguese	1.10	(0.72–1.68)	0.80	(0.47–1.35)
W & N European	0.79	(0.40–1.57)	0.80	(0.39–1.63)
Eastern European	0.91	(0.18–4.70)	0.51	(0.06–4.38)
Other	3.62*	(1.08–12.0)	0.39	(0.04–3.50)
Overweight[3]	1.46*	(1.04–2.73)	1.31	(0.91–1.89)
No. of cigarettes/day	0.98*	(0.97–0.99)	0.96*	(0.94–0.97)
Daily ETS exposure[4]				
None	1		1	
<3 hours	1.01	(0.73–1.41)	1.15	(0.81–1.65)
≥3 hours	0.82	(0.60–1.12)	0.90	(0.65–1.25)
Chronic cough[5]	1.02	(0.64–1.64)	0.81	(0.44–1.49)
Chronic phlegm[5]	0.80	(0.43–1.48)	1.04	(0.38–2.84)
Asthma[6]	0.81	(0.45–1.47)	1	(0.54–1.85)
FEV1/FVC ratio[7]				
≥0.7	1		1	
0.5–0.7	1.06	(0.73–1.54)	1.13	(0.71–1.82)
<0.5	2.29	(0.72–26.8)		

[1] Results from multivariable logistic regression models (among persons who were smokers at SAPALDIA1) with outcome = "having quit smoking by SAPALDIA2" and covariate part consisting of study area and all variables listed in the table. [2] Low = ≤9 years of school; medium = 12 years of school; high = college or university [3] Body mass index >25 kg/m^2 [4] Mean duration of daily exposure to environmental tobacco smoke [5] Regular occurrence of respective symptom for ≥3 months per year and for at least 2 years [6] Confirmed by a doctor [7] FVC = forced vital lung capacity, FEV1 = forced expiratory volume in one second

Table S7: Estimated independent associations of smoking cessation between SAPALDIA2 (2002) and SAPALDIA3 (2010/11) with different personal characteristics assessed at SAPALDIA2, by gender.

	Men		Women	
Characteristic	**Odds ratio**	**(95% CI)**	**Odds ratio**	**(95% CI)**
Age (years)	1.02	(0.99–1.05)	1.00	(0.97–1.03)
Civil status				
Married	1		1	
Divorced	1.21	(0.57–2.55)	1.96	(0.99–3.87)
Widowed			2.2	(0.68–7.12)
Single	1.77	(0.95–3.31)	1.31	(0.68–2.54)
Educational level[2]				
Low	1		1	
Medium	1.28	(0.29–5.56)	3.67*	(1.04–12.9)
High	1.45	(0.32–6.49)	4.87*	(1.23–19.25)
Nationality				
Swiss	1		1	
Italian, Spanish, Portuguese	0.35*	(0.13–0.94)	0.78	(0.28–2.16)
W & N European	0.66	(0.20–2.25)	0.79	(0.22–2.86)
Eastern European			3.69	(0.25–55.0)
Other	0.49	(0.04–6.32)	0.28	(0.02–4.21)
Overweight[3]	1.68*	(1.04–2.73)	1.05	(0.59–1.85)
No. of cigarettes/day	0.97*	(0.95–0.99)	0.91*	(0.88–0.94)
Daily ETS exposure[4]				
None	1		1	
<3 hours	1.32	(0.79–2.22)	0.99	(0.54–1.82)
≥3 hours	1.35	(0.73–2.52)	0.92	(0.54–1.82)
Chronic cough[5]	1.08	(0.50–2.36)	1.04	(0.36–3.07)
Chronic phlegm[5]	0.83	(0.41–1.65)	0.27	(0.03–2.40)
Asthma[6]	0.29*	(0.09–0.94)	0.68	(0.23–2.03)
FEV1/FVC ratio[7]				
≥0.7	1		1	
0.5–0.7	1.02	(0.60–1.74)	0.83	(0.41–1.65)
<0.5	4.39	(0.72–26.8)		
Alcohol consumption				
Less than once a week	1		1	
Less than once a day	1.40	(0.70–2.79)	0.67	(0.37–1.22)
1 or 2 times a day	0.93	(0.44–1.97)	0.39*	(0.18–0.84)
≥ 3 times a day	1.78	(0.54–5.84)	23.40	(0.57–949.9)
Physical Activity				
Insufficiently active	1		1	
Sufficiently active[8]	0.79	(0.49–1.28)	1.03	(0.60–1.75)
New dog ownership[9]	1.87	(0.87–4.01)	2.1	(0.95–4.63)
Diabetes[10]	0.61	(0.20–1.90)	20	(0.91–439)
Cancer[10]	2.55	(0.70–9.26)	1.85	(0.56–6.11)
Depression[10]	0.60	(0.19–1.88)	0.50	(0.18–1.38)
Cardiovascular disease[11]	1.51	(0.84–2.74)	2.32*	(1.02–5.29)
Health Status (SF-36 survey)				
SF36 Pain	1.01	(1.00–1.03)	0.99	(0.98–1.01)
SF36 general health perceptions	1.00	(0.99–1.02)	1.01	(0.99–1.03)
SF36 mental health	0.99	(0.97–1.01)	1.00	(0.98–1.03)
SF36 physical functioning	1.00	(0.98–1.02)	0.99	(0.97–1.01)
SF36 role-emotional	1.00	(0.99–1.01)	1.01	(1.00–1.03)
SF36 role-physical	0.99	(0.98–1.01)	1.00	(0.99–1.01)
SF36 Social Functioning[12]				
Low	0.65	(0.32–1.30)	0.50	(0.23–1.09)
Medium	0.64	(0.32–1.28)	0.68	(0.33–1.40)
High	1		1	
SF36 Energy and Vitality[12]				
Low	1.91	(0.85–4.33)	2.94*	(1.09–7.92)
Medium	1.53	(0.83–2.81)	1.66	(0.75–3.69)
High	1		1	

[1] Results from multivariable logistic regression models (among persons who were smokers at SAPALDIA2) with outcome = "having quit smoking by SAPALDIA3" and covariate part consisting of study area and all variables listed in the table. [2] Low = ≤9 years of school; medium = 12 years of school; high = college or university [3] Body mass index >25 kg/m^2 [4] Mean duration of daily exposure to environmental tobacco smoke [5] Regular occurrence of respective symptom for ≥3 months per year and for at least 2 years [6] Confirmed by

a doctor [7] FVC = forced vital lung capacity, FEV1 = forced expiratory volume in one second [8] At least 150 min/week of moderate or vigorous physical activity [9] Reported ownership of a dog in SAPALDIA2 but not in SAPALDIA1 [10] Diagnosed by a doctor [11] Hypertension, stroke and/or intake of heart medication [12] Low = score <25; medium = 25 ≤score <75; high = score ≥ 5 * $p < 0.05$