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Smoking Behaviour in Germany: Evidence from the SOEP

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Abstract

As in most OECD countries, smoking prevalence and cigarette consumption have been decreasing in Germany since the early 2000s. This paper analyses whether smoking prevalence and cigarette consumption, as well as their development over time, differ between socio-economic subgroups. Identifying these differences provides insights into the effect of policy interventions on German smoking behaviour. Based on data from the Socio-Economic Panel (SOEP), a large longitudinal study of the German population, we find that both the decline in smoking prevalence and the decline in average cigarette consumption were probably driven by a behavioural change of younger people, as well as of those with a high educational level and those with a high income. People who quit smoking were on average more highly educated, had a higher income and had most likely a lower cigarette consumption (before quitting). In contrast, smoking prevalence increased among people who were older than 45 and had a low educational level and among those who were unemployed. Smoking prevalence among women was relatively constant over time. Indeed, the smoking prevalence of women and men converged over time, especially in older age groups. Daily cigarette consumption of smokers increased among 66-to-75-year-olds, although it decreased in all other age groups. One explanation might be that the tobacco control measures were successful only in certain socio-economic subgroups. Not only smoking prevalence, but also smoking intensity was higher among men, among those with a lower educational level and among those with a lower income. Especially for younger birth cohorts, smoking prevalence among those with a lower educational level was particularly high. Thus, based on data from 1998 through 2014, the so-called social gradient in smoking was only a distinct feature of younger birth cohorts, and not of older ones.

Keywords: Smoking prevalence, cigarette consumption, tobacco control measures, SOEP.
JEL Classification: I12, I18.

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1 Introduction

> "The adoption of remedial actions over the next half century produced what is arguably the most important public health triumph of that period in the United States and in other developed nations." (Warner, 2014).

A striking trend in health-related consumption behaviour across all OECD countries has been a steady decline in smoking prevalence and cigarette consumption over the last few decades. In Germany, this gradual decline in tobacco use started only at the beginning of the 21st century.[1] Various tobacco control measures have been implemented simultaneously in Germany, ranging from advertising bans and smoking bans, to increases in tobacco taxation. Whether smoking (in Germany) really has declined as a result of tobacco control policies, as suggested by tobacco control researcher Warner (2014), is a highly relevant public policy question. This paper sheds light on the German experience. The analysis is based on the SOEP, a widely used longitudinal survey containing detailed individual-specific information including self-reported smoking behaviour.[2] We analyse in depth the development of smoking prevalence and cigarette consumption from 1998 through 2014, bearing in mind that tobacco regulation changed substantially over the same time horizon.[3] Whenever possible, our findings are compared with other surveys. To the best of our knowledge, no other work provides such a comprehensive overview of the development of smoking prevalence and cigarette consumption in Germany. As depicted in Figure 1, aggregated yearly self-reported cigarette consumption decreased by 36% from about 123 billion in 1998 to 90 billion sticks in 2014, according to SOEP data (blue line). In comparison, legal sales of factory made cigarettes (FMC) reported by the German Federal Bureau of Statistics (Destatis) fell by 43% from about 138 billion in 1998 to 80 billion sticks in 2014 (red line).[4] However, if also considering fine-cut (FC) tobacco sales (green line), depicted as cigarette stick equivalents (CSE), the decline is substantially smaller, namely 26% (from 161 billion in 1998 to 119 billion CSE in 2014).[5] Parallel to the downward trend in cigarette sales, the real weighted average cigarette price (WAP) increased sharply. Both the decrease in cigarette sales and the increase in prices were most distinct between 2002 and 2006, the years in which cigarette taxes rose by about one cent per stick each year. A striking development is that self-reported cigarette consumption did not decrease as much as legal sales over the

[1] In contrast, in the United States, the downward trend had already started in the 1970s.

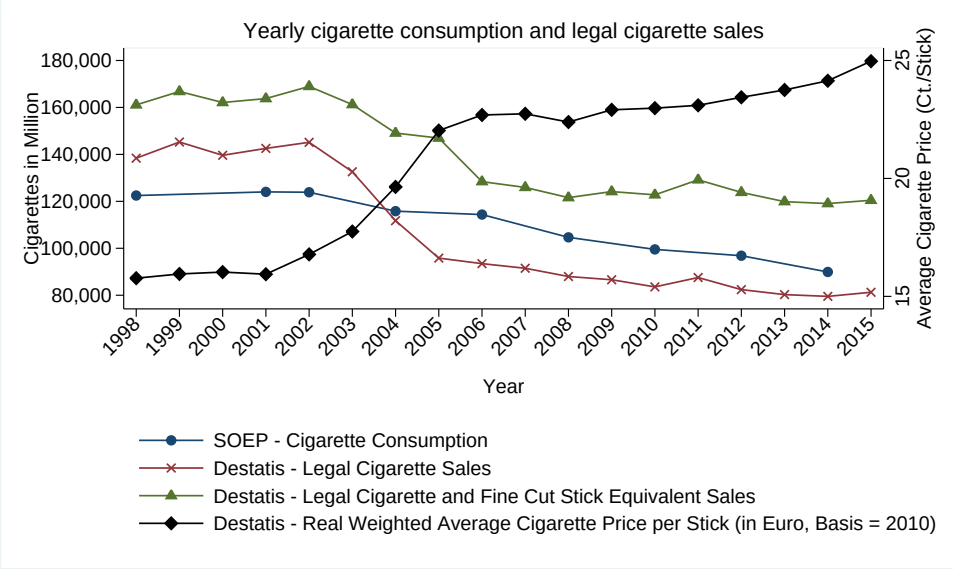
[2] The SOEP (2016) is provided by the German Institute for Economic Research (DIW), Berlin.

[3] *Smoking prevalence* and *smoking rate* are terms both used for the share of smokers in the population. In this paper, we use these two words interchangeably.

[4] See Statistisches Bundesamt (2015).

[5] To convert legal fine-cut sales (reported in grams) to cigarette stick equivalents, a conversion rate of 0.65 was used in all years: 0.65 grams of loose tobacco corresponds to one cigarette stick.

Figure 1: Aggregate yearly cigarette consumption and legal cigarette sales from 1998 through 2015



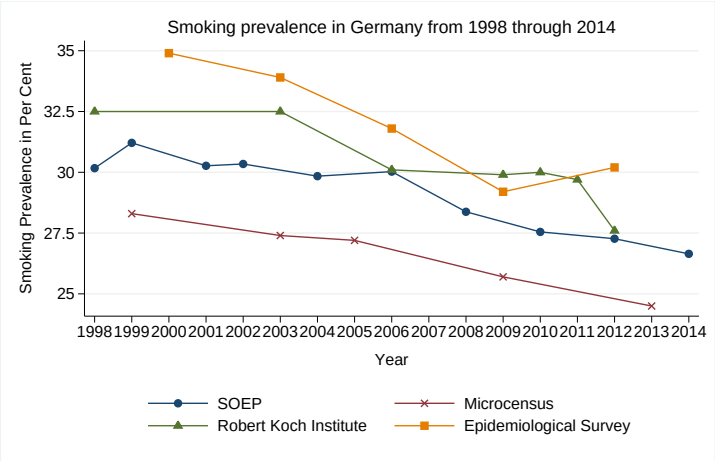
Note: SOEP waves 1998–2014. Unbalanced panel. For 1998 and 2001, the number of CPD are approximated. No numbers of CPD are available for wave 1999. Data weighted by expansion factors supplied in data set. Destatis waves 1998–2015. FC conversion rate = 0.65.

same period. One explanation might be that part of the price increase was compensated for by consumers, with a shift to the illegal market. Furthermore, self-reported cigarette consumption is substantially lower than legal sales. There are several possible explanations of this difference. One explanation is that in surveys, smokers tend to underreport their tobacco consumption in general (see Warner (1977)). Another relates to the relative increase in FC tobacco sales compared to FMC sales in recent years.[6] Consumers have gradually been switching from FMC to roll-your-own or make-your-own cigarettes made from fine-cut tobacco. Since the consumption of cigarettes made from fine-cut tobacco might be harder to estimate (because consumers can not measure them in packs), consumption underreporting may be more relevant than for FMC consumption. Another explanation of the lower self-reported consumption is that SOEP data only includes adult smokers. Tobacco consumption by people younger than 18 years is thus absent from the aggregated yearly cigarette consumption based on the SOEP. In line with cigarette consumption and sales, smoking prevalence has been decreasing substantially in Germany since 1998. Based on SOEP data, smoking prevalence fell from 30.2% in 1998 to 26.7% in 2014. Several other individual-level surveys also find a similar downward trend in smoking prevalence, but the levels differ across surveys. Figure 2 presents German smoking prevalence

[6]See Statistisches Bundesamt (2015).

data which have been provided by several surveys since 1998.[7] Smoking rates reported in the Microcensus from Destatis, are always lower than the numbers from other data sources. Smoking rates are the highest in the epidemiological survey on substance abuse (ESA), except for 2009. The SOEP smoking rates lie between the two. One explanation of the difference in smoking rates is the age of the respondents. The Microcensus, for example, surveys people older than 14 years, whereas the SOEP surveys people from age 18.[8] Because the share of smokers is relatively low among those aged 15 to 17, this may lead to lower observed smoking rates in the Microcensus.[9] SOEP is unique in comparison to the other surveys, because no other survey reports the number of smokers as frequently over such a long period of time. Smoking prevalence is available in 1998, 1999, 2001 and, from 2002 through 2014, every two years. Moreover, no other survey is constructed as a longitudinal study. Only SOEP data enables the researcher to compile a smoking history for each individual that reveals individual-specific changes in smoking behaviour.

Figure 2: Smoking prevalence in Germany from 1998 through 2014



Note: SOEP waves 1998–2014 (Age> 18). Unbalanced panel. Data weighted by expansion factors supplied in the data set. Microcensus waves 1999, 2003, 2005, 2009 and 2013 (Age> 14). Epidemiological Survey waves 2000, 2003, 2006, 2009 and 2012 (Age 18-59 in 2000, 2003; Age 18–64 since 2006). Data supplied by the Robert Koch Institute: BGS98 wave 1998 (Age 18–79), DEGS1 wave 2011 (Age 18–79), GEDA waves 2009, 2010 and 2012 (Age> 17) and GSTel wave 2003 and 2006 (Age 18–79).

[7]For exact numbers of smoking prevalence reported by the Microcensus, RKI and ESA see Table B12 in the Appendix. Numbers are from Statistisches Bundesamt (2000, 2004, 2006, 2011, 2014), Robert Koch-Institut (2011, 2012, 2014), Lampert and Burger (2005a), Lampert, M. & List, S. M. (2009), Kraus et al. (2014, 2010), Baumeister et al. (2008), and Kraus et al. (2014).

[8]GEDA ("Gesundheit in Deutschland aktuell") includes people from age 18, the ESA in 2000 and 2003 from 18-59 and from 2006, from 18–64, the BGS98 (Bundes-Gesundheitssurvey), the DEGS1 ("Gesundheit Erwachsener in Deutschland") and the GSTel (Telefonische Gesundheitssurveys) people aged 18–79.

[9]See Section 4.1 for more information about smoking prevalence in different age groups. See Lampert and Kuntz (2014) for smoking prevalence among 11-to-17-year-olds.

Another quality of the SOEP is the detailed information about average tobacco consumption. The individual-specific data can be used to estimate smoking intensity, which is defined as the average number of smoked cigarettes per day (CPD) conditional on being a smoker. Many researchers concentrate on smoking prevalence, but from a health perspective, it is also useful to assess smoking intensity. Even if smoking prevalence declines, the public health costs of smoking may still be immense if the remaining smokers have a high smoking intensity. According to SOEP data, smoking intensity, just like smoking prevalence, has been declining since 1998. Smoking intensity declined from about 17 CPD in 1998 to 14.5 CPD in 2014.[10] One explanation might be that policy measures were able to reduce both smoking prevalence and smoking intensity. The decrease in official legal cigarette sales was thus driven by simultaneously falling smoking prevalence and smoking intensity. Note that, unfortunately, no other surveys report average smoking intensity, so that our SOEP findings cannot be compared to other surveys.

The question now arises whether or not the decline in general smoking prevalence and smoking intensity can be linked to specific socio-economic groups. Also, it is important to analyse whether some socio-economic groups have experienced no decrease or even an increase in smoking prevalence or intensity. The latter would indicate some degree of ineffectiveness of the tobacco control measures. In general, many researchers claim that there are social differences within the smoking behaviour of the German population, both in smoking prevalence and smoking intensity.[11] The results of a detailed descriptive analysis of the development of smoking prevalence and smoking intensity indicate that there are substantial differences between socio-economic groups. Both the decline in smoking prevalence and the decline in smoking intensity was driven by people with higher educational levels and higher income. Thus, in 2014, smoking prevalence and intensity was higher among the less educated and people with low income. Furthermore, in younger cohorts, the share of ever smokers was highest among people with a lower educational level and people with lower income. In contrast, quitters were on average better educated and tended to have higher income than non-quitters. Schulze and Lampert (2006) claim that there is a "social gradient" in smoking.[12] They claim that the probability of smoking is higher for those with a lower income and lower educational level. This social gradient hypothesis is supported by SOEP data, at least among younger cohorts. A surprising finding regarding smoking prevalence is that compared to men, smoking prevalence

[10] Note that if not indicated otherwise, all of the following descriptive statistics are based on SOEP data.

[11] See for example, Westphal and Doblhammer (2012), Schneider and Schneider (2012) or Krebsforschungszentrum (2004).

[12] The UCL Institute of Health Equity define the social gradient in health as "a term used to describe the phenomenon whereby people who are less advantaged in terms of socioeconomic position have worse health (and shorter lives) than those who are more advantaged" (see `http://www.instituteofhealthequity.org/articles/institute-articles/social-gradient`).

among women did not decrease much. Smoking intensity decreased in all age groups, except among 66-to-75-year-olds. All in all, smoking prevalence and intensity decreased the most among people with a high educational level and people with high income, among men and among younger people.

The remainder of the paper is structured as follows. Section 2 presents an overview of the main findings of a descriptive analysis of smoking behaviour, based on SOEP data for 1998 to 2014. Section 3 describes the data set used, Section 4 contains an analysis of smoking prevalence in Germany and Section 5 focuses on the development of smoking intensity. Provided descriptive statistics consider gender, age, birth year, educational level, occupational position, marital status, net equivalent household income and state of residence. Furthermore, the characteristics of heavy smokers, that is, smokers with a consumption of more than 20 CPD, are displayed. Section 6 focuses on differences in smoking initiation across several birth cohorts. Section 6.3 presents results on quitting behaviour, and Section 7 addresses the relationship between attitudes towards health and smoking behaviour.[13] Section 8 concludes.

2 Background and Main Findings

Since 1998, various tobacco control measures have been implemented in Germany. Figure 3 displays all measures between 1998 and 2015, as well as the times series of smoking prevalence and legal cigarette sales.[14] The initial tobacco control measures were advertising restrictions, followed by smoking bans at the workplace, tobacco tax increases and a prohibition on selling cigarettes to persons younger than 16.[15] Simultaneously, since 1998, smoking prevalence and cigarette consumption have decreased. Descriptive statistics based on SOEP data indicate that the decrease in smoking prevalence was mainly driven by lower smoking prevalence among men, people younger than 45, better educated people and people with a high income.

Even though men were still more likely to smoke than women in 2014, smoking prevalence among men had decreased substantially since 1998, whereas smoking prevalence among women had remained more or less stable. This finding is line with Lampert et al. (2013), Pötschke-Langer et al. (2009) and data from the Microcensus.[16]

Furthermore, although smoking prevalence decreased among younger people, it increased

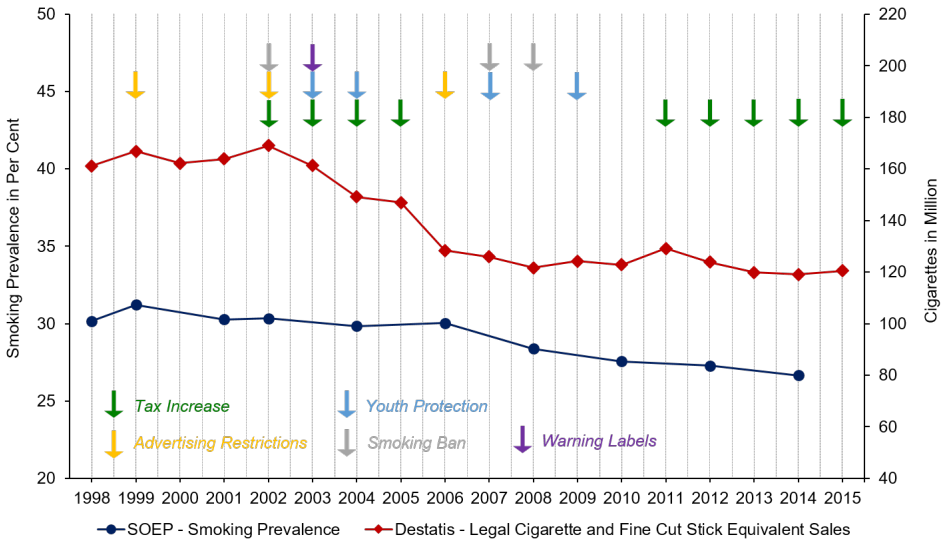
[13]The definition of 'heavy smoker' follows the recommendation of the German Federal Statistical Office and of the World Health Organization (see `https://www.gbe-bund.de/gbe10/abrechnung.prc_abr_test_logon?p_uid=gast&p_aid=0&p_knoten=FID&p_sprache=E&p_suchstring=7974`).

[14]Figure 3 is an adjusted version of Figure 4 in Deutsches Krebsforschungszentrum (2014).

[15]A detailed list of German tobacco control measures can be found in Table A1 in the Appendix.

[16]Results of the Microcensus can be downloaded from `http://www.gbe-bund.de/gbe10/pkg_isgbe5.prc_isgbe?p_uid=gast&p_aid=28377279&p_sprache=D`.

Figure 3: Tobacco control measures in Germany and smoking behaviour



Note: SOEP waves 1998–2014 (Age> 18). Unbalanced panel. Data weighted by expansion factors supplied in the data set. Destatis waves 1998–2015. FC conversion rate = 0.65.

among older ones. Kraus et al. (2013) offer one explanation and argue that tobacco control measures most likely contributed to fewer young people taking up smoking than it motivated long-time smokers to stop.

Considering the individual's educational level of a person, we find that smoking prevalence increased among school dropouts, remained at the same level among those with a basic secondary education and decreased for all higher educational levels. Our findings update those of Lampert (2011), who found that between 2003 and 2009, smoking prevalence decreased among all educational levels. It seems that educational differences became more important in health-related behaviour. Smoking prevalence also increased among the unemployed. Taken together, these results are alarming, because they imply that efforts at reducing smoking prevalence were not equally successful across socio-economic groups. In fact, tobacco regulation was quite unsuccessful in curbing smoking in some groups.

Not only did smoking prevalence develop differently in various socio-economic groups, in 2014, smoking prevalence differed substantially across socio-economic groups. Smoking prevalence was higher for men, for the age group 21 to 60, for cohorts born after 1949, for those with a lower educational level, for those with a lower income and for unemployed or divorced people. Our findings update those of Lampert et al. (2013), who found that smoking prevalence was highest among 18-to-29-year-olds, referring to data collected between 2008 and 2011. But as can be observed in SOEP data, between 2008 and 2014, smoking prevalence among younger

age groups fell considerably. As a consequence, in 2014, smoking prevalence between 21 and 60 did not differ much. After 60, there was a steady decline in smoking prevalence. This is compatible with a habit persistence interpretation of smoking, where at older age health concerns lead part of the smoker population to quit. Furthermore, our findings are in line with Lampert (2011) and Pötschke-Langer et al. (2009) (among others), namely that smoking prevalence is higher for people with a lower educational level.

Parallel to the decline in smoking prevalence, we observe a decline in cigarette consumption. The decline in cigarette consumption was likely caused by two factors. First, lower smoking prevalence and second, lower average smoking intensity of smokers. Considering socio-economic factors, the decline in smoking intensity was mostly driven by a reduced consumption of smokers younger than 50, older smokers born before 1960, highly educated smokers, smokers with high income, civil servants and married smokers. In contrast, smoking intensity increased among smokers aged 66 to 75. This was surely more a cohort effect than an age effect, meaning that cohorts with relatively high smoking intensity shifted to older age groups. Nonetheless, from a health perspective, increasing smoking intensity among the older smoking population is alarming. Just like smoking prevalence, smoking intensity differed between socio-economic groups in 2014. We observe the highest smoking intensity among men, age group 46 to 65, cohorts born between 1950–1969, lower educational levels, lower income groups, workers, divorcees and those living in West Germany. These results suggest that there was, and maybe still is, a social gradient in smoking intensity. Results depicted in Pötschke-Langer et al. (2009) and Pabst et al. (2013) also indicate that male and older smokers consume more.

The social gradient in smoking intensity becomes even more evident, if the focus is only on those who smoked more than 20 CPD, that is, so-called heavy smokers. Between 1998 and 2014, the share of school dropouts, those with a low income and unemployed people increased among heavy smokers. Furthermore, in 2014, heavy smokers were on average less educated and had a lower income than non-heavy smokers. Remarkably, the results indicate a rational attitude of heavy smokers towards health. Not only do heavy smokers described their state of health more often as poor and bad, they also did not care about a health-conscious diet. Both observations are in line with their extensive cigarette consumption.

Independent of socio-economic background, it is of interest to know whether only those smokers with an already low consumption have reduced their consumption, whether only heavy smokers (CPD>20) have reduced their consumption and whether all smokers reduced their consumption. Although the decrease in smoking intensity was more pronounced for non-heavy smokers, heavy smokers also reduced their consumption. Thus, it seems that all smokers

reduced their consumption. If only non-heavy smokers had decreased their consumption, it would have implied that those who have the highest risk of smoking-related diseases, have not changed their smoking behaviour. The reduced consumption of smokers lead to a redistribution of smokers from higher to lower cigarette-consumption groups. In 2014, the share of heavy smokers was smaller than in all previous years.

Differences in smoking prevalence across socio-economic groups are closely related to the development of smoking initiation and cessation. There are two possible explanations of a decrease in smoking prevalence. First, fewer people start smoking or second, former smokers stop smoking. One way to assess whether less people started smoking is to compare the percentage of ever smokers across birth cohorts.[17] In fact, in 2014, younger generations of men, those born after 1979, had a substantially lower share of ever smokers than older generations. Thus, the likelihood of starting smoking declined for men. Younger generations of women, had a significantly higher share of ever smokers than older generations. Thus, the likelihood of starting smoking increased for women. Our findings are in line with those of Schulze and Lampert (2006). Moreover, results indicate a social gradient in smoking only for younger generations. Among people born from 1950 onwards, the share of ever smokers was highest among lower educational levels and lower income groups. In contrast, among people born before 1950, the share of ever smokers was highest among higher educational levels and higher income groups. The so-called "class character" of smoking is also described by Dinges (2012) and Pampel et al. (2015). Also, we find that people started smoking much younger. The average starting age dropped considerably, namely from 21 to 16, across smokers born between 1910 and 1996. Although Schulze and Lampert (2006) use fewer cohorts, for smokers born between 1921 and 1980, they find similar results.

The descriptive analysis of smoking cessation reveals that about 21% of female and male smokers quit smoking between 2002 and 2014, which contributes to the decline in smoking prevalence.[18] Just as with smoking initiation, in 2014, we observe a social gradient in smoking cessation. Quitters were on average better educated and had a higher income than non-quitters. Yet, comparing quit rates across generations, we find that this pattern only holds among older generations. Although among older cohorts, quitting rates were higher for those with a higher educational level, among younger cohorts, they were not. Quitting rates did not differ much across educational levels among younger cohorts. Our findings challenge those of Schulze and Lampert (2006), who find that the higher the educational level, the higher the quitting rate of

[17] An ever smoker is defined as a person who smokes or used to smoke on a regular basis.

[18] To maintain a large sample size, the analysis was restricted to the years 2002 to 2012. For more information, see Section 3.

this group. Finally, among those with a lower smoking intensity, a higher share quit smoking.

3 Data Set

The following analysis uses longitudinal data from the SOEP. The SOEP is the biggest and longest-running longitudinal data set available in Germany and, in recent years, includes more than 20,000 individuals per year (Schupp (2012)). Since 1984, SOEP has been providing yearly micro data about income, employment, educational and other socio-economic information of German households and their members who are older than 16. Since 1998, in some years, respondents were interviewed about their smoking behaviour. We construct an unbalanced panel of the adult population which, dependent on the years, consists of between 14,000 and 27,000 individuals.[19]

In 1998, 1999, 2001 and since 2002 every two years, respondents were asked whether they smoked cigarettes, pipes or cigars.[20] Based on this information, a dichotomous smoking prevalence variable *smoker* was constructed indicating whether a person is a current smoker. This variable does not distinguish between cigarette, pipes and cigar smokers. In all years except in 1999, current smokers were asked about their average daily tobacco consumption. Unfortunately, the line of questions about the tobacco consumption differs between the years. In recent years, hence between 2002 and 2014, there was a detailed question about average daily consumption. Individuals were asked how many cigarettes, pipes and cigars they smoked on average per day of the last week. For those years, average daily cigarette as well as pipes and cigar consumption is available.

In 1998 and 2001, respondents were asked how much cigarettes, pipes or cigars they smoke *in total* on a daily basis. For those two years, there is only information about the total consumption of tobacco products. Thus, the average number of smoked cigarettes was approximated. Because on average about 99.7% of the total tobacco consumption are cigarettes, we expect our approximation to be close to true consumption.[21]

[19] Although from 1998 through 2006 also people aged 17 are part of the full adult survey, for the purpose of consistency only people aged 18 and older are considered in the main analysis. In 2006, the survey method changed. People aged 17 do not answer the normal adult questionnaire but instead a special 'youth' questionnaire. The 'youth' questionnaire unfortunately includes no questions about smoking behaviour.

[20] The questionnaire of each year is available at `http://panel.gsoep.de/soepinfo2012/`.

[21] The approximation was done as follows: first, for the 2002 wave and following waves, average overall daily consumption of tobacco products was calculated by adding up average daily cigarette, pipe and cigar consumption. Second, the waves 2002 to 2014 were pooled and the sample was split into several subsamples, first by gender and than by age. Third, for each subsample, the average difference between overall consumption of tobacco products and cigarette consumption was calculated. This difference was used to approximate the average number of smoked CPD for 1998 and 2001. The average difference between overall consumption of tobacco products and cigarette consumption in waves 2002 to 2014 was subtracted from the average overall consumption of

The reported average number of CPD was used to construct the count variable *intensity* containing the average number of smoked CPD conditional on being a smoker. A problem of self-reported cigarette consumption is, as Wang and Heitjan (2008) describe, a reporting error called 'heaping'. Some respondents tend to round-off counts at multiplies of five instead of reporting exact cigarette counts. This problem is also observable in SOEP data. A consequence may be biased estimations of parameters such as mean cigarette consumption.

In some years, additional questions concerning smoking behaviour were added to the survey. This information allows the construction of three more smoking-related variables. First, the dichotomous variable *ever smoker* indicating if a respondent ever smoked on a regular basis in the course of his life. Respondents are also categorised as ever smokers if they had ever answered to be a smoker in one of the previous years. Second, the variable *starting age* which is the age at which an ever smoker started smoking.[22]

Third, the binary variable *quitter* indicating if a respondent quit smoking during the period of observation and did not start again. Identifying quitters is only possible because of the unique panel structure of the SOEP. As an alternative, we construct the dichotomous variable *quitter ever* identifying respondents who in 2012 answer to be an ever smoker but currently does not smoke. Fourth, the variable *quitting age* which is the age at which an ever smoker quit smoking.

To analyse quitting behaviour, two balanced panel data sets were constructed. A balanced panel is a data set in which each individual is observed in each year.[23] The first one includes SOEP waves 1998 to 2014 and covers 3,947 individuals.[24] To include young people in the analysis, which is particularly interesting in relation to smoking behaviour, the panel is not balanced for those born after 1981. This way, the sample also includes those who turned 18 in the respective year and thus became eligible for the survey in 1999 and following years. To increase the sample size of the data set, a second balanced panel was constructed which includes SOEP waves 2002 to 2014 and covers 8,219.[25] This panel is not balanced for individuals born after 1986. It needs to be pointed out that the use of the different samples leads to varying smoking rates and smoking intensity. For example, Table 1 displays smoking prevalence in several years for the three different samples. The estimated smoking prevalence differs substantially between the samples. All descriptive statistics were weighted by expansion factors

tobacco products in waves 1998 and 2001 to estimate average cigarette consumption. Unfortunately, due to the approximation, in waves 1998 and 2001, the average smoked number of CPD are no longer integers.

[22]The variable *ever smoker* is available in the years 1999, 2001, 2002 and 2012.

[23]In contrast, in an unbalanced panel, for some individuals observations are missing in some years.

[24]More precisely SOEP waves 1998, 1999, 2001, 2002, 2004, 2006, 2008, 2010, 2012 and 2014.

[25]More precisely SOEP waves 2002, 2004, 2006, 2008, 2010, 2012 and 2014.

Table 1: Smoking prevalence in the unbalanced and balanced panel of SOEP data

	Year										Change	
	98	**99**	**01**	**02**	**04**	**06**	**08**	**10**	**12**	**14**	**Δ98**	**Δ02**
	In Per Cent											
Unbalanced	30.2	31.2	30.3	30.3	29.8	30.0	28.4	27.5	27.3	26.6	−11.7 (0.0)	−12.2 (0.0)
Balanced 98–14	31.3	31.3	29.8	30.2	29.0	29.2	27.2	27.0	25.3	24.2	−22.8 (0.0)	−19.9 (0.0)
Balanced 02–14				30.2	29.0	28.8	26.8	26.6	24.6	23.9		−21.0 (0.0)

Note: SOEP waves 1998–2014. Data weighted by expansion factors supplied in the data set. The last two columns depict the change in smoking prevalence compared to 2014.

(cross-sectional weights) provided in the data set. The cross-sectional weights are person-related weighting variables and consider sampling probabilities, non-response and attrition. Detailed information about the structure of the survey method and sampling weights are summarised in the Haisken-DeNew and Frick (2005).[26] The provided weights were applied as suggested by Kroh (2010).

4 Smoking Prevalence

Smoking prevalence in Germany decreased by about 3.5 percentage points or 12%, from 30.2% in 1998 to 26.7% in 2014. This section examines whether the decline in smoking prevalence can be linked to specific across socio-economic groups. Two questions guide this section: first, who was responsible for the decline in smoking prevalence and second, who was still smoking in 2014?[27]

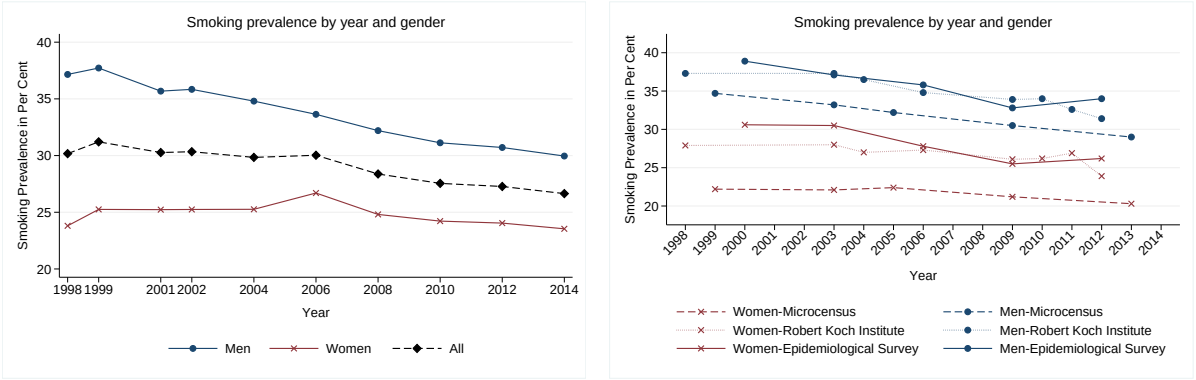
4.1 Gender and Age

Figure 4 Panel (a) depicts the time series of smoking prevalence for both genders based on SOEP data from 1998 through 2014. The black dashed line is the time series of smoking prevalence in the whole population. There is an evident difference in the development of smoking prevalence between genders. The percentage of male smokers declined from 37% in 1998 to 30% in 2014. The share of female smokers remained more or less stable around 24%. There was only a modest decline from 2008 onwards. Nevertheless, in 2014, men were still more likely to smoke.

[26] An updated version of the Desktop Companion of the SOEP can be assessed as a web version under `http://about.paneldata.org/soep/dtc/sample.html`.

[27] A summary of the descriptive results can be found at the end of this section and in the Appendix in Table B2 to Table B11. They present smoking prevalence among several socio-economic groups and their respective change over time.

Figure 4: Time series of smoking prevalence in Germany from 1998 through 2014



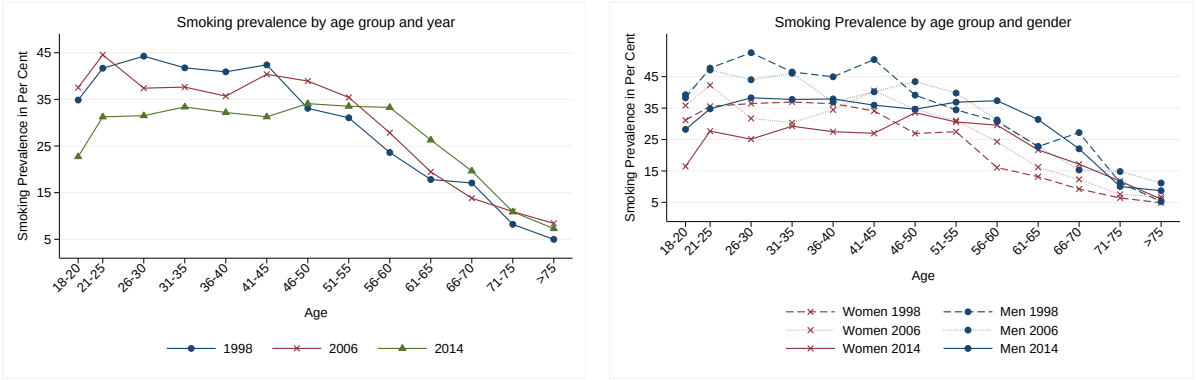
(a) SOEP (b) Microcensus, RKI, ESA

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. Microcensus waves 1999, 2003, 2005, 2009 and 2013 (Age >14). Epidemiological Survey waves 2000, 2003, 2006, 2009 and 2012 (Age 18–59 in 2000, 2003; Age 18–64 since 2006). Data supplied by the Robert Koch Institute: BGS wave 1998 (Age 18–79), DEGS1 wave 2011 (Age 18–79), GEDA waves 2009, 2010 and 2012 (Age >17) and GSTel wave 2003, 2004 and 2006 (Age 18–79).

For comparison, Panel (b) of Figure 4 depicts the time series of smoking prevalence for both genders reported by other surveys. The findings are similar. First, independent of the survey, smoking prevalence among men was higher throughout the whole observation period. Furthermore, smoking prevalence among men declined substantially, 6 percentage points according to the Microcensus and the surveys of the RKI and 5 percentage points according to the ESA (see also Table B12 in the Appendix). The Microcensus, in line with SOEP, reported nearly stable smoking prevalence among women. The surveys of the RKI and the ESA reported declining smoking prevalence among women. Only the ESA reported an unexpected increase of smoking prevalence among women and men between 2009 and 2012.

The SOEP allows to analyse smoking behaviour with regard to many other socio-economic factors. Figure 5 Panel (a) depicts smoking prevalence for 1998, 2002, 2006 and 2014 all by age group. The blue line depicts smoking intensity in 1998, the red in 2002, the green line in 2006 and the orange in 2014. Younger age groups, aged 18 to 45, had a lower smoking prevalence in 2014 than in 1998. The opposite development can be observed for age groups older than 45, among whom smoking prevalence was higher. The high smoking rates of older age groups can be explained by high past smoking rates. In 1998, smoking rates were highest between age 26 and 45. Sixteen years later, in 2014, smoking rates were highest between age 46 and 60. Because age groups with high shares of smokers got older, smoking prevalence among older age groups increased. The highest decrease in smoking prevalence occurred among the youngest age group, namely 18 to 20. Among the youngest age group, smoking prevalence fell by about

Figure 5: Smoking prevalence by age group, year and gender



(a) Overall (b) Women, Men

Note: SOEP waves 1998, 2006 and 2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set.

35% (see Table B2 in the Appendix). The highest increase in smoking prevalence occurred among the age group 61–65, among whom smoking prevalence fell by about 48%. Eventually, in 2014, smoking prevalence was relatively constant between age 21 and 60 and then declined in old age. In comparison to 1998, smoking prevalence smoothed across age groups.

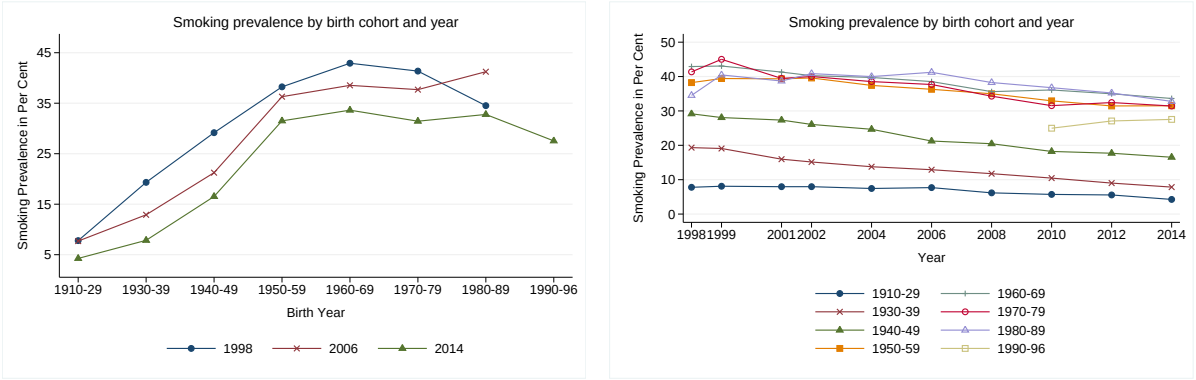
Panel (b) of Figure 5 depicts smoking prevalence for both genders by age group. Both among men and women, smoking prevalence declined among younger age groups and increased among older ones. All in all, smokers got older, that is, the distribution of smokers "moved to the right" for both male and female smokers. In all years, smoking rates of men were higher than those of women across all age groups. Yet, whereas in 1998, there was a substantial difference between smoking rates of men and women, in 2014, the difference was smaller, especially for older age groups (> 45).

The analysis over time across age groups can be confusing, because age groups are not fixed over time. The portrayal of birth cohorts helps immensely, because it allows to differentiate between an 'age effect' and particular characteristics of a birth cohort.

Figure 6 Panel (a) displays smoking prevalence in 1998, 2006 and 2014 all by birth cohort. The blue line depicts smoking prevalence in 1998, the green in 2006 and the red in 2014. The comparison of smoking prevalence across birth cohorts reveals that there was a generational change. In 2014, smoking prevalence was at a low level in the birth cohort 1910–29, the share of smokers increased consistently up to birth cohort 1950–59 and then remained almost stable in all younger birth cohorts.

Figure 6 Panel (b) displays the time series of smoking prevalence for each birth cohort. Smoking prevalence declined in each birth cohort. Even cohorts with high smoking rates,

Figure 6: Smoking prevalence by birth cohort and year

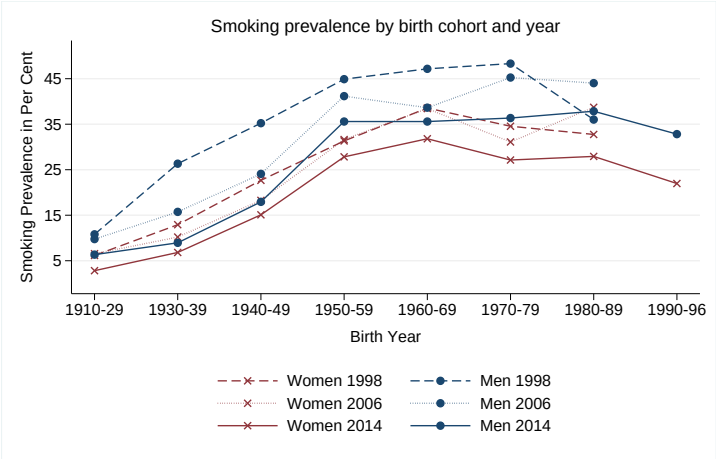


(a) (b)

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set.

namely cohorts born after 1950, experienced a downward trend. Only among the youngest cohort smoking prevalence increased. But in 2010, the 1990–1994 birth cohort only consisted of individuals aged between 18 and 20. Smoking prevalence was relatively low among people younger than 20. As the cohort ages, smoking prevalence was likely to increase.

Figure 7: Smoking prevalence by birth cohort, gender and year

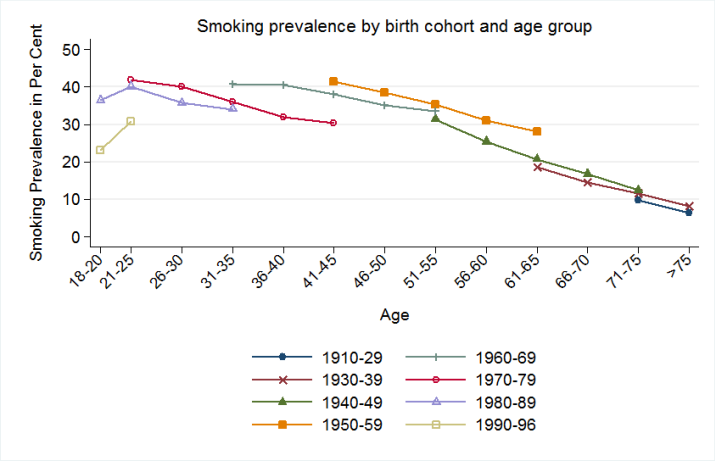


Note: SOEP waves 1998, 2006 and 2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set.

Figure 7 displays smoking prevalence for both genders by birth cohort in 1998, 2006 and 2014. The development of smoking prevalence across cohorts was qualitatively the same for both men and women. Smoking prevalence declined in each birth cohort, which is visible by the vertical shifts of the curves. Quantitatively, the decline in smoking prevalence was more pronounced among men than women and among older than younger cohorts. The substantial

decline in smoking prevalence among older men explains the assimilation of smoking prevalence among men and women in older age groups (Figure 5).

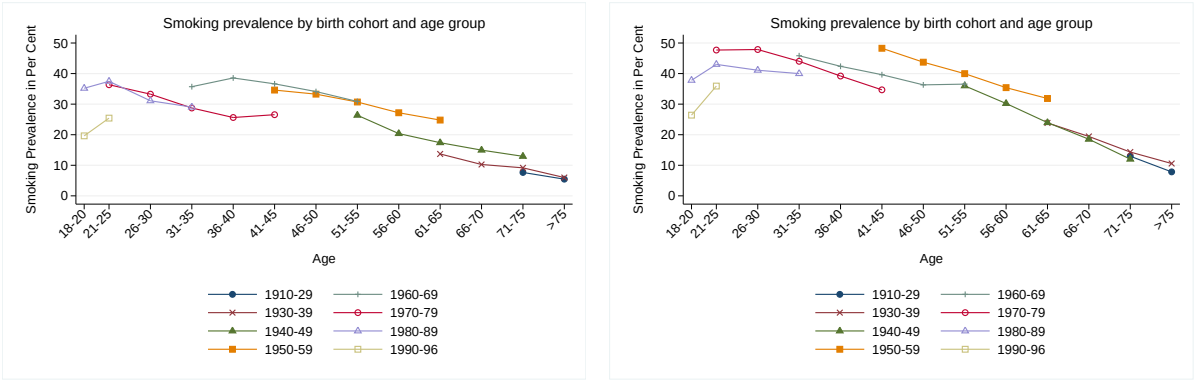
Figure 8: Smoking prevalence by birth cohort and age group



Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set.

Figure 8 depicts smoking prevalence for each birth cohort by age groups. Displayed is so to speak a smoking age profile for each birth cohort. Based on data from 1998 through 2014, for all birth cohorts, smoking prevalence decreased with age. Also, with the exception of the 1950–59 cohort, younger cohorts had a lower smoking prevalence than older ones in comparable age groups.

Figure 9: Smoking prevalence by birth cohort, age group and gender



(a) Women (b) Men

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set.

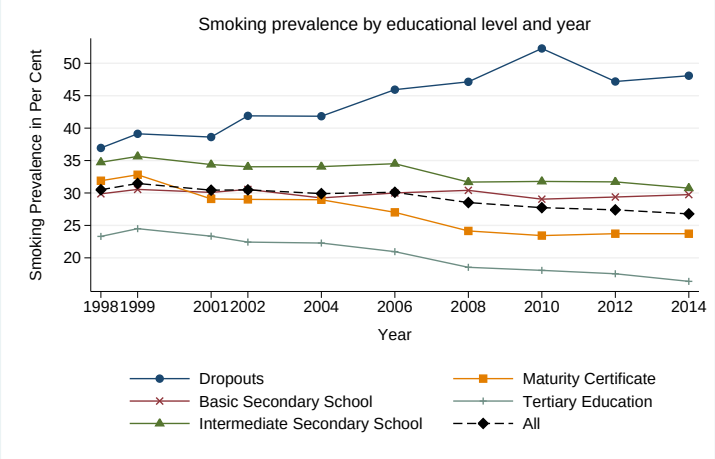
Figure 9 Panel (a) depicts the smoking age profile for women and Panel (b) depicts the smoking age profile for men. As overall, both among men and women, smoking prevalence

decreased with age and younger cohorts had a lower smoking prevalence. But in comparison to the overall population, among women the difference in the levels of smoking prevalence between the birth cohorts was smaller.

4.2 Education

According to Pampel et al. (2014), "the decline in smoking has occurred fastest among high educational groups, thus widening the gap with lower educational groups and contributing to growing educational disparities in mortality more generally". The next section addresses this claim by assessing smoking prevalence in several educational groups and its development over time.

Figure 10: Time series of smoking prevalence by educational level



Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. Basic Secondary = Hauptschulabschluss; Intermediate = Realschulabschluss; Maturity Cert.= Abitur; Tertiary Educ. = Uni-/ Fachhochschulabschluss. Sample does not include respondents still in school.

Figure 10 depicts the time series of smoking prevalence for five educational levels.[28] The black dashed line is the time series of smoking prevalence in the whole population. Smoking prevalence decreased among all educational groups with a degree higher than a basic secondary

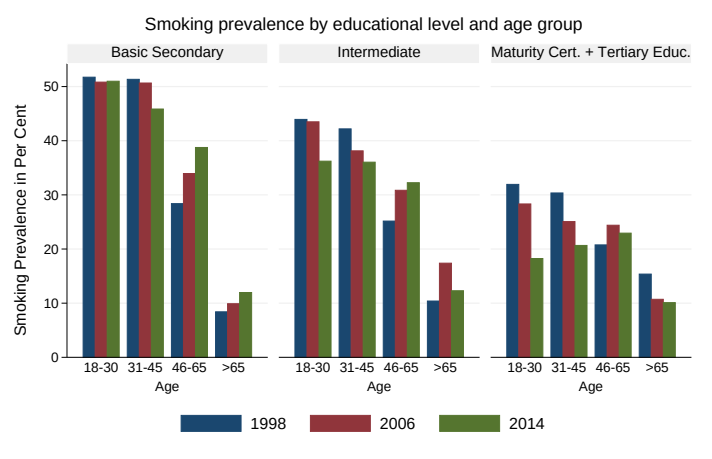
[28]Educational attainment of a person is measured in five categories. Respondents who inadequately completed school (*kein Abschluss*) are defined as 'dropouts'. Individuals with general elementary school (*Hauptschulabschluss ohne berufliche Ausbildung*) or a basic vocational qualification (*Hauptschulabschluss und berufliche Ausbildung*) are defined as having 'basic secondary school' education. Respondents with intermediate general qualification (*Mittlere Reife ohne berufliche Ausbildung*) or intermediate vocational qualification (*Mittlere Reife und berufliche Ausbildung*) are defined as having 'intermediate secondary school' education. Respondents with general maturity certificate (*Fachhochschulreife/Abitur ohne berufliche Ausbildung*) or vocational maturity certificate (*Fachhochschulreife/Abitur und berufliche Ausbildung*) are defined as having 'maturity certificate' education. Respondents with lower tertiary education (Fachhochschulabschluss) or higher tertiary education (*Hochschulabschluss*) are defined as having 'tertiary education'. Respondents still in school are not considered in the analysis of smoking behaviour.

school education. The highest absolute and also relative decline in smoking prevalence occurred among people with a tertiary education, namely smoking prevalence fell by 6.8 percentage points or 29% (see Table B3 in the Appendix). The decline in smoking prevalence was second highest among people with a maturity certificate (8 percentage points or 25%).

In all years, people with a tertiary education always had the lowest share of smokers, whereas people who inadequately completed school, so-called dropouts, had the highest share of smokers. Among school drop-outs, smoking prevalence was as high as 52% (2010). Both findings are in line with the claim of Pampel et al. (2015), who argue that educational disparities in smoking are growing.

As average educational attainment is dependent on the age of the person, the relationship between smoking prevalence and education may also be influenced by the age of the person. Figure 11 displays smoking prevalence for three educational groups all by age group in 1998,

Figure 11: Smoking prevalence by educational level and age group in 1998, 2006 and 2014



Note: SOEP waves 1998, 2006 and 2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. Basic Secondary = Hauptschulabschluss; Intermediate = Realschulabschluss; Maturity Cert. = Abitur; Tertiary Educ. = Uni-/ Fachhochschulabschluss. Sample does not include respondents still in school. Due to sample size respondents with a maturity certificate and respondents with a tertiary education are combined.

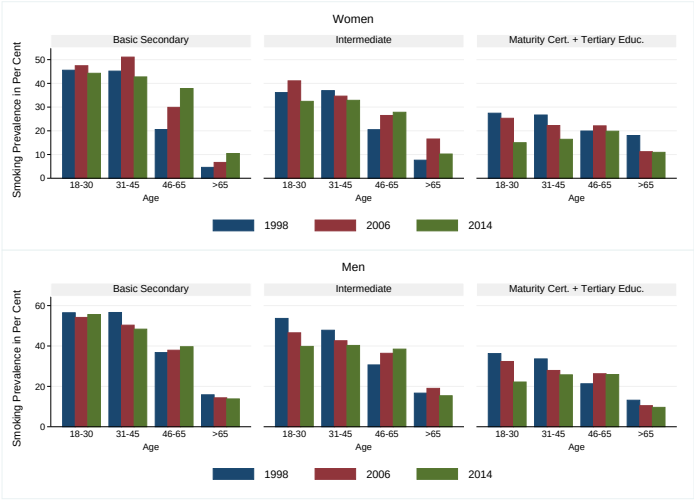
2006 and 2014. The blue bars depict smoking prevalence in 1998, the red bars in 2006 and the green bars in 2014.[29] Due to the sample size, only three educational categories are defined. The development of smoking prevalence across educational groups differed between age groups. At first glance, it seems that there was no significant change in smoking prevalence among people with basic secondary education (Figure 10). But when considering the age of a person, smoking prevalence among people with basic education actually fell for those younger than

[29] See also Table B13 in the Appendix.

46 and only increased among those aged older than 45. Among people with an intermediate education, smoking prevalence decreased overall, but considering the age, smoking prevalence increased among those aged 46 or above. Among better educated people, smoking prevalence decreased overall and in each age group but not in the age group 46 to 65.

To assess whether these findings for the development of smoking prevalence across educational levels and age hold for both men and women, Figure 12 depicts for both genders the smoking prevalence for the three educational groups by age group. First, as overall, among younger

Figure 12: Smoking prevalence by educational level, age group and gender in 1998, 2006 and 2014



Note: SOEP waves 1998, 2006 and 2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. Basic Secondary = Hauptschulabschluss; Intermediate = Realschulabschluss; Maturity Cert. = Abitur; Tertiary Educ. = Uni-/ Fachhochschulabschluss. Sample does not include respondents still in school and respondents with no completed school degree. Due to sample size, respondents with a maturity certificate and respondents with a tertiary education are combined.

women and men, smoking prevalence decreased among all educational groups. The size of the decrease was visibly dependent on the educational level. The higher the educational level was, the higher the decrease in smoking prevalence was. Second, as overall, among women and men older than 45, it depended on the educational level, whether smoking prevalence declined or not. Third, there were however differences in the development of smoking prevalence between women and men among those older than 65. In 1998, smoking rates of women older than 65 were highest among those with a higher educational level. Among men older than 65, smoking rates were highest among those with an intermediate educational level. In 2014, smoking rates of women older than 65 were more or less the same across educational groups. Among men

older than 65, smoking rates were still highest among those with an intermediate educational level. Considering only those who were less educated, smoking prevalence among women older than 65 smoking prevalence increased, whereas it decreased among men. In summary, whereas among younger age groups (<46 years), smoking prevalence decreased across all educational levels, among older ones, it depended on the educational level whether smoking prevalence decreased or increased.

For all age groups younger than 65, smoking prevalence was in all years higher among those with basic secondary education. This held for both genders.[30] After the age of 65, there was a big drop in smoking prevalence among people with a basic and an intermediate educational level, but not among people with a higher one. Thus, compared with younger age groups, in which smoking prevalence was always lower, smoking prevalence was relatively high among older better educated people. One explanation is that in the first half of the 19th century smoking was more concentrated among higher socio-economic groups (Schulze and Lampert (2006), Dinges (2012)). Smoking prevalence among men was higher or at the same level than among women, independent of educational level and age. However, in 1998, smoking prevalence was exceptionally high among better educated women older than 65, not only compared to women with other degrees but also to better educated men.[31]

To sum up, the development of smoking prevalence was simultaneously dependent on the educational attainment and on the age of a person. However, this finding might be related to a generational change and was not a age development per se. A comparison of smoking prevalence across birth cohorts seems appropriate. The sample was split into two parts: younger cohorts (born between 1960–1996) and older cohorts (born between 1910–1959).

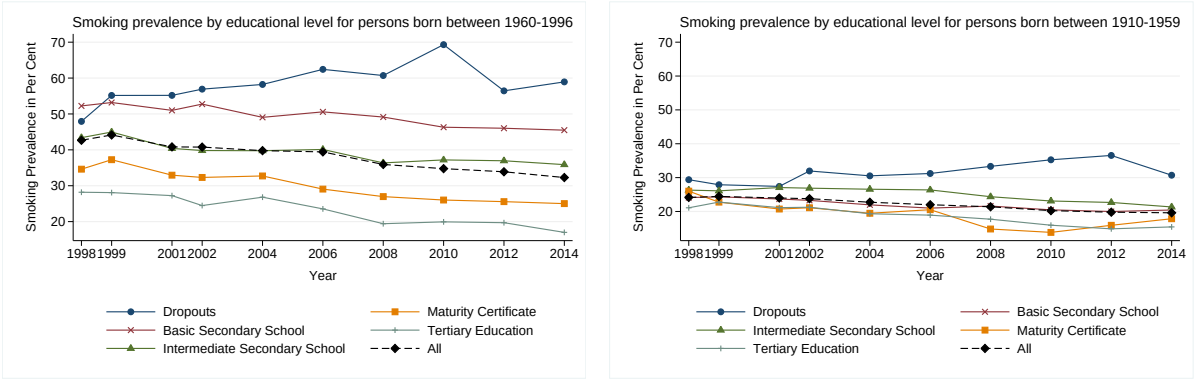
Figure 13 Panel (a) depicts for persons born between 1960 and 1996 the time series of smoking prevalence for five educational levels, Panel (b) for those born between 1910 and 1959. The relationship between smoking prevalence and educational level changed across generations. Even though, among older cohorts (born < 1960), smoking prevalence was highest among those with an intermediate education (considering only those with a finished degree), in general, smoking prevalence did not differ much across levels of education, especially in 2014. Among younger cohorts (born > 1959), smoking prevalence was highest among those with a basic secondary education.[32] Furthermore, the difference in smoking prevalence between educational groups was substantial among younger cohorts and followed a specific pattern, namely, the

[30] One exception were women aged between 46 to 65 in 1998. Among them, smoking prevalence among women with a basic, elementary education were as high as among women with a intermediate secondary school education.

[31] Huisman et al. (2005) find a similar high smoking prevalence among high educated older women for several European Countries in 1998.

[32] Note that overall smoking prevalence was highest among those with an intermediate education.

Figure 13: Time series of smoking prevalence by educational level and birth cohort



(a) Born between 1960–1996 (b) Born between 1910–59

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. Basic Secondary = Hauptschulabschluss; Intermediate = Realschulabschluss; Maturity Cert.= Abitur; Tertiary Educ. = Uni-/ Fachhochschulabschluss. Sample does not include respondents still in school.

higher the educational level was, the lower the smoking prevalence was.

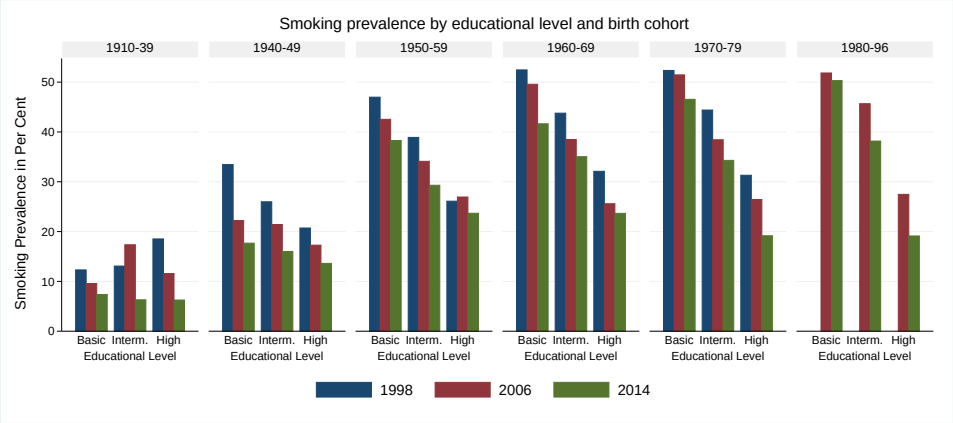
To assess the relationship of educational level and birth cohort with regard to smoking probabilities in more detail, Figure 14 displays smoking prevalence for six birth cohorts by educational level in 1998, 2006 and 2014. The blue bars depict smoking intensity in 1998, the red bars in 2006 and the green bars in 2014. In 2014, among the youngest cohort (1980–1996), about 50% of those with a basic education smoked, whereas only 20% of those with a high educational level smoked. Among the oldest cohort (1910–1939), about 7% of those with a basic education smoked and about 6% of those with a high educational level smoked. In summary, based on data from 1998 through 2014, the social gradient in smoking prevalence was a distinct feature among younger cohorts, not among older cohorts.

With regard to development over time, smoking prevalence declined in each birth cohort across all educational levels. The question as to whether smoking prevalence fell more among better educated people depends on the birth cohort. Whereas among younger cohorts (born >1959), smoking prevalence declined really more among those with a higher educational level, among older cohorts (born <1959) it did only for those born between 1910 and 1939.

4.3 Income, Job, Marital Status and Region

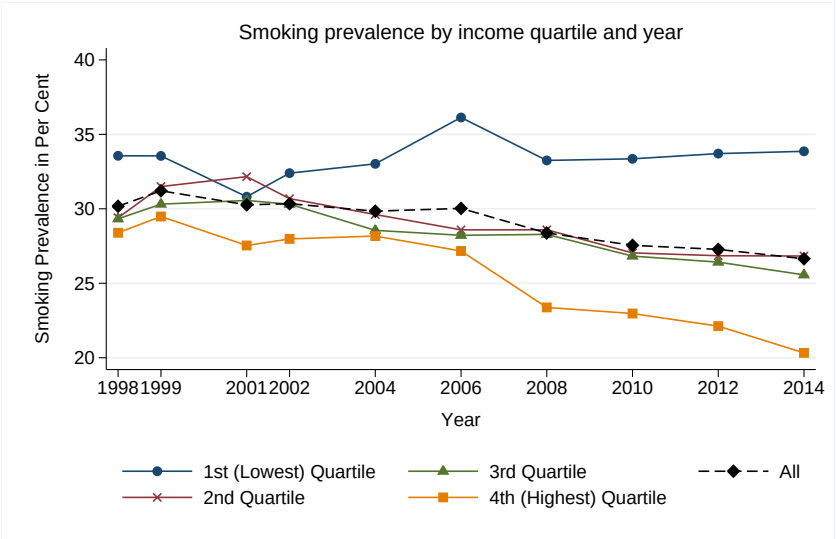
Up to this point, descriptive statistics already indicated disparities of smoking prevalence between socio-economic groups formed by gender, age, birth cohort and educational level. This section expands the analysis and considers income, occupational position, marital status and living region of a person.

Figure 14: Smoking prevalence by educational level and birth cohort in 1998, 2006 and 2014



Note: SOEP waves 1998, 2006 and 2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. Basic Secondary = Hauptschulabschluss; Intermediate = Realschulabschluss; Maturity Cert. = Abitur; Tertiary Educ. = Uni-/ Fachhochschulabschluss. Sample does not include respondents still in school and respondents with no completed school degree. Due to sample size, respondents with a maturity certificate and respondents with a tertiary education are combined.

Figure 15: Time series of smoking prevalence by income quartile (net equivalent household income)



Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set.

Figure 15 displays the time series of smoking prevalence for four income groups. The black dashed line is the time series of smoking prevalence in the whole population. The income groups are formed by building quartiles according to the yearly net equivalent income[33] of the household the surveyed person is living in. [34]

The higher the income quartile was, the higher was the decrease in smoking prevalence and the lower was the smoking prevalence. Indeed, although smoking prevalence decreased among all other income groups, it increased for the lowest one. Moreover, the relationship between income and smoking prevalence changed over the years. In 1998, smoking prevalence was similar across the three highest income quartiles. In 2014, smoking prevalence was notably lower in the highest income quartile than in lower quartiles.

Table 2: Smoking prevalence by educational level and income quartile in 1998 and 2014

	Net Equivalent Household Income				
Educational Level	**1. Quartile**	**2. Quartile**	**3. Quartile**	**4. Quartile**	**Total**
1998	Smoking Prevalence in Per Cent				
Basic Secondary School	29.88	27.67	30.55	30.77	29.56
Intermediate Secondary School	42.17	33.39	33.22	31.10	34.58
Maturity Cert. + Tertiary Educ.	35.74	27.21	24.82	23.93	26.38
Total	33.53	29.19	29.87	28.16	30.14
2014	Smoking Prevalence in Per Cent				
Educational Level					
Basic Secondary School	33.00	27.18	29.58	27.48	29.75
Intermediate Secondary School	39.76	29.21	30.01	24.68	30.75
Maturity Cert. + Tertiary Educ.	26.24	21.62	17.46	16.32	18.94
Total	33.86	26.83	25.57	20.33	26.65

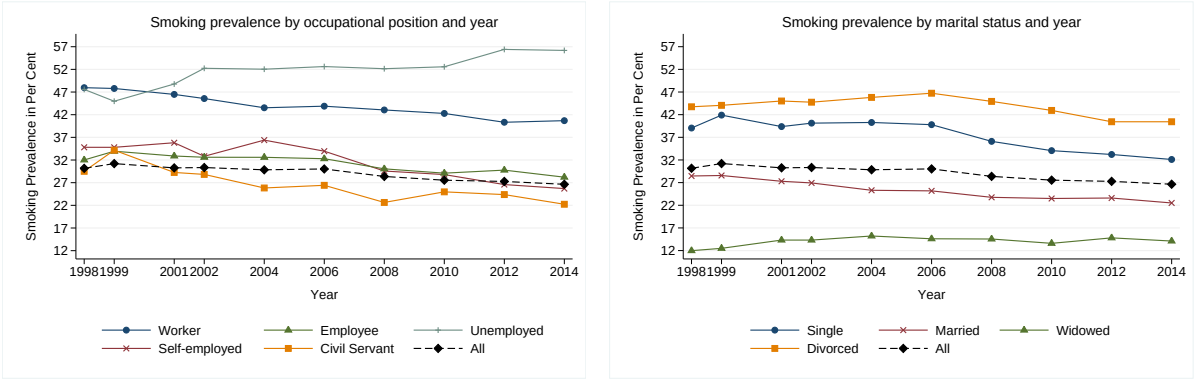
Note: SOEP waves 1998 and 2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. Basic Secondary = Hauptschulabschluss; Intermediate = Realschulabschluss; Maturity Cert.= Abitur; Tertiary Educ. = Uni-/ Fachhochschulabschluss. Due to sample size, persons still in school are excluded.

To assess whether or not the development of smoking prevalence across income quartiles differed when also the educational level is considered, Table 2 depicts smoking prevalence among educational levels and income quartiles. Overall, smoking prevalence increased for the lowest income quartile. Yet, this is only true for people with a lower educational level. For more highly educated people, smoking prevalence decreased even in the lowest income quartile. Nevertheless, independent of the educational level, smoking prevalence was highest in the lowest income quartile. This pattern was stable over time.

[33]The net equivalent household income was calculated using the OECD-modified scale, which considers the size of the household and the age of the household members. For more information on the OECD-modified scale see `http://www.oecd.org/eco/growth/OECD-Note-EquivalenceScales.pdf`.

[34]For more information about the influence of income on smoking prevalence using German data see Schulze and Lampert (2006), Lampert (2010) and Schneider and Schneider (2012).

Figure 16: Time series of smoking prevalence by occupational position and marital status



(a) Occupational Position (b) Marital Status

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set.

Figure 16 Panel (a) depicts the time series of smoking prevalence for five occupational positions, Panel (b) the times series for four marital statuses. The black dashed line is the time series of smoking prevalence in the whole population. The development and level of smoking prevalence differed across occupational position and marital status. Whereas smoking prevalence increased among unemployed people, it decreased among all other occupational groups. The largest decline in smoking prevalence occurred among self-employed people. In all years, unemployed people and workers had the highest share of smokers, and civil servants had the lowest. The relationship between smoking prevalence and occupational position is linked with the findings regarding educational level. Smoking prevalence was the highest among those occupational groups with highest share of people with lower educational level, namely workers and unemployed people.[35] As depicted in Figure 10, lower educated people had on average higher smoking prevalence. In contrast, smoking prevalence was lowest among civil servants, among whom most had a tertiary education.[36] People with a tertiary education had on average the lowest smoking prevalence.

Smoking prevalence declined among single, married or divorced people and increased among widowed people. However, smoking prevalence among widowed people was in general relatively low. This may be a result of the high share of people older than 65.[37] As seen in Section 4.1, smoking prevalence among people older than 65 was relatively low. In all years, divorced people had the highest smoking prevalence.

[35] In 2014, 52% of workers and 48% of unemployed people had a basic secondary education. In comparison, only 19% of self-employed people had a basic secondary education.

[36] In 2014, 63% of civil servants had a tertiary education, whereas only 4% of workers did.

[37] In 2014, 81% of widowed people are over 65. In comparison, only 23% of divorced people are over 65.

The development of smoking prevalence in different regions of Germany can be found in the Appendix in Table B4. Overall, smoking prevalence remained about the same in East Germany (including Berlin), namely about 30% in 1998 as well as in 2014, but decreased in West Germany from about 30% in 1998 to about 26% in 2014. Hence, in 2014, East Germany had a higher smoking prevalence.

As a summary, Table 3 and Table 4 present socio-economic characteristics of smokers from 1998 through 2014.[38] It should be noted that changes in socio-economic characteristics of smokers might be caused by changes of the structure of the whole population. Hence, as a reference, socio-economic characteristics of the whole population is displayed in the respective upper panel.

In 2014, 52% of the German Population were men, 35% were aged between 46 and 65 and 53% were married. In 2014, most respondents had a basic secondary school education (36%). In 2014, most smoker were male, were aged between 46 and 65, had a basic educational level, belonged to the lowest income quartile, worked as an employee and were married. The only difference compared with 1998 can be found for age. In 1998, most smokers were aged between 31 and 45. In 2008, for the first time, most smokers were aged between 46 and 65.

Comparing the socio-economic characteristics of smokers with that of the total population in 2014, reveals a few specific characteristics of smokers. The share of men, of 46-to-65-year-olds, of those with a low income, of unemployed and divorced people is exceptionally high for smokers.

[38] Table B15 and Table B16 in the Appendix, provide socio-economic characteristics of smokers for women and men separately.

Table 3: Socio-economic characteristics of smokers

	Year										
	1998	**1999**	**2001**	**2002**	**2004**	**2006**	**2008**	**2010**	**2012**	**2014**	**Total**
All	**Gender**										
Women	52.33	52.20	51.81	51.90	52.01	52.01	51.75	51.81	51.56	51.62	51.90
Men	47.67	47.80	48.19	48.10	47.99	47.99	48.25	48.19	48.44	48.38	48.10
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Smokers											
Women	41.30	42.23	43.19	43.19	44.03	46.25	45.25	45.55	45.45	45.61	44.16
Men	58.70	57.77	56.81	56.81	55.97	53.75	54.75	54.45	54.55	54.39	55.84
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Age Group										
All											
18–30	18.55	18.04	17.45	17.06	17.06	18.39	18.29	18.09	17.74	17.28	17.80
31–45	28.71	28.86	28.75	28.60	27.56	26.91	25.68	24.32	23.13	22.57	26.49
46–65	32.64	32.84	32.82	32.76	32.46	31.42	32.01	33.18	34.76	35.25	33.01
>65	20.09	20.26	20.98	21.58	22.92	23.28	24.02	24.41	24.36	24.90	22.70
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Smokers											
18–30	25.47	25.52	22.68	22.53	22.90	24.62	23.14	22.51	21.23	19.30	23.05
31–45	39.65	39.50	39.01	37.68	35.87	34.09	31.96	29.52	28.39	27.31	34.48
46–65	28.44	28.38	31.41	32.69	32.99	32.72	35.23	38.25	40.09	42.44	34.08
>65	6.43	6.60	6.89	7.11	8.24	8.57	9.68	9.71	10.30	10.95	8.39
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Educational Level										
All											
Dropouts	2.69	2.67	1.97	2.01	2.12	2.17	1.96	1.90	1.86	1.92	2.13
Basic Secondary	48.67	48.57	46.39	46.43	45.53	42.68	41.20	38.68	37.29	35.49	43.07
Intermediate	25.76	25.70	26.36	26.95	26.91	28.13	28.34	28.50	28.72	28.42	27.39
Maturity Cert.	8.50	8.72	9.42	9.32	9.44	9.86	10.22	11.00	11.19	11.91	9.96
Tertiary Educ.	14.39	14.34	15.86	15.29	16.00	17.17	18.28	19.92	20.93	22.25	17.46
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Smokers											
Dropouts	3.23	3.29	2.50	2.77	3.00	3.35	3.27	3.61	3.22	3.46	3.16
Basic Secondary	47.47	47.16	46.09	46.72	44.87	43.01	44.28	40.92	40.18	39.56	44.14
Intermediate	29.38	29.23	30.06	30.27	30.89	32.61	31.74	32.99	33.40	32.74	31.28
Maturity Cert.	8.91	9.13	9.07	8.92	9.22	8.94	8.72	9.38	9.74	10.59	9.24
Tertiary Educ.	11.01	11.19	12.28	11.32	12.02	12.08	11.98	13.10	13.46	13.65	12.17
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. Basic Secondary = Hauptschulabschluss; Intermediate = Realschulabschluss; Maturity Cert.= Abitur; Tertiary Educ. = Uni-/ Fachhochschulabschluss.

Table 4: Socio-economic characteristics of smokers: continued

	Year										
	1998	**1999**	**2001**	**2002**	**2004**	**2006**	**2008**	**2010**	**2012**	**2014**	**Total**
All	**Income**										
1st Quartile	25.01	25.00	25.00	25.01	25.01	25.00	25.01	25.02	25.00	25.01	25.01
2nd Quartile	25.01	25.00	25.00	24.99	24.99	25.00	25.01	24.98	25.00	25.00	25.00
3rd Quartile	24.99	25.01	25.01	24.99	25.01	25.02	24.98	25.00	25.00	25.00	25.00
4nd Quartile	24.99	24.99	24.99	25.00	24.99	24.98	25.00	25.00	24.99	24.99	24.99
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Smokers											
1st Quartile	27.82	26.88	25.45	26.71	27.68	30.09	29.30	30.30	30.90	31.78	28.62
2nd Quartile	24.37	25.22	26.56	25.28	24.80	23.80	25.20	24.52	24.61	25.17	24.96
3rd Quartile	24.29	24.29	25.25	24.96	23.93	23.51	24.90	24.34	24.22	23.99	24.37
4nd Quartile	23.52	23.61	22.74	23.05	23.59	22.60	20.59	20.84	20.27	19.07	22.05
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Occupational Position										
All											
Worker	29.12	30.04	29.85	30.22	28.24	27.21	29.30	26.79	24.30	22.44	27.70
Self-employed	8.73	9.46	9.63	8.85	9.47	9.82	8.81	9.00	9.45	9.30	9.25
Employee	43.71	44.43	45.07	44.82	44.46	44.83	46.80	48.51	51.51	53.70	46.86
Civil Servant	6.69	6.27	5.90	5.42	5.27	5.59	5.67	6.22	6.13	6.09	5.92
Unemployed	11.75	9.80	9.55	10.70	12.56	12.55	9.42	9.48	8.61	8.47	10.26
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Smokers											
Worker	36.22	36.54	36.01	35.82	32.24	31.56	35.55	32.76	28.82	27.85	33.41
Self-employed	7.88	8.38	8.95	7.56	9.04	8.81	7.35	7.50	7.39	7.29	8.03
Employee	36.28	38.40	38.47	38.02	38.01	38.27	39.64	40.83	45.11	46.22	39.83
Civil Servant	5.12	5.46	4.48	4.06	3.57	3.90	3.62	4.49	4.39	4.13	4.33
Unemployed	14.49	11.22	12.09	14.54	17.14	17.45	13.85	14.42	14.29	14.51	14.40
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Marital Status										
All											
Single	21.59	22.24	23.12	23.37	24.59	25.81	27.07	28.01	27.89	28.59	25.25
Married	60.51	59.49	59.42	59.15	57.51	56.17	54.93	54.07	54.95	53.28	56.93
Widowed	10.49	10.28	9.54	9.33	9.17	8.82	8.57	8.33	7.56	8.05	9.01
Divorced	7.41	7.99	7.92	8.15	8.72	9.20	9.43	9.58	9.60	10.08	8.81
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Smokers											
Single	27.97	29.95	30.09	30.96	33.18	34.23	34.53	34.70	34.02	34.80	32.37
Married	57.12	54.62	53.62	52.59	48.76	47.14	46.09	46.21	47.62	45.46	50.05
Widowed	4.17	4.13	4.51	4.41	4.68	4.29	4.41	4.12	4.11	4.30	4.32
Divorced	10.75	11.31	11.78	12.04	13.38	14.33	14.97	14.97	14.25	15.44	13.26
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set.

Concluding this section, we summarise the findings on the development of smoking prevalence between 1998 and 2014. Smoking prevalence among men decreased, whereas among women it remained about the same. As a consequence, smoking prevalence among men and women aged 45 and older assimilated. Among those younger than 46, smoking prevalence decreased in all educational groups. Among those older than 45, smoking prevalence increased, except among better educated people older than 65. Irrespective of gender, smoking prevalence declined in each birth cohort. However, educational disparities in smoking prevalence grew across birth cohorts. Among younger cohorts, those with a higher educational level had a lower smoking prevalence . Among older cohorts, smoking prevalence did not differ much across levels of education. Smoking prevalence increased in the lowest income quartile, whereas it decreased in all other income quartiles. In West Germany, smoking prevalence decreased, whereas it remained stable in East Germany. Smoking prevalence increased among unemployed individuals, it decreased in all other occupational positions. Smoking prevalence decreased among single, married or divorced people but remained stable among those who are widowed.

In 2014, men were more likely to smoke, independently of age and birth year. Smoking prevalence among men and women was relatively stable from age 21 to 60 and then was lower for older age groups. Smoking prevalence was higher among younger birth cohorts than among older cohorts, but overall relatively stable among those born after 1949. Among persons aged from 18 to 65, smoking prevalence was higher among those who were less educated than those who were better educated. Among those older than 65, this relationship did not hold. In 2014, smoking prevalence among persons older than 65 was about the same for all educational groups.[39] On average, the lower the income group was, the higher was the smoking prevalence. Smoking prevalence was also highest among unemployed, divorced people and people living in East Germany.

In 2014, smokers were more likely to be male, to be aged between 46 to 65, to have a basic secondary school education, to belong to the lowest income quartile, to work as an employee or to be married.

[39]Interestingly, in 1998, smoking prevalence among persons older than 65 was higher for more highly educated people.

5 Smoking Intensity

Average smoking intensity declined by 14% from about 17 CPD in 1998 to 14.5 CPD in 2014.[40] This section tries to disentangle this decline in smoking intensity. To the best of our knowledge, no other work published in Germany analyses smoking intensity in such depth. In general, not much attention is paid to the development of smoking intensity.

In the first part of the section, we try to identify the mechanics which lead to the decrease in overall smoking intensity. For this purpose, smokers are divided into groups according to their daily cigarette consumption. The question is whether all smokers reduced their consumption or was the decline in smoking intensity mainly driven by smokers with an already low smoking intensity. The second part analyses the influence of socio-economic factors on smoking intensity. The objective is to answer whether one particular socio-economic group was responsible for the decline in overall smoking intensity and whether socio-economic factors were related to a person's average smoking intensity.[41]

In our analysis, we will concentrate on cigarette consumption, not on pipe or cigar consumption. The reason is that 96% of all smokers smoke exclusively cigarettes. Therefore, a change in smoking behaviour is best portrayed based on cigarette consumption. In addition, for the years 1998, 1999 and 2001, we have no information about average pipe and cigar consumption[42] Table 5 displays the categorisation of smokers into three types. Smokers who

Table 5: Distribution of smokers by product type from 2002 through 2014

	Year							
	2002	**2004**	**2006**	**2008**	**2010**	**2012**	**2014**	**Total**
	In Per Cent							
Smokertype								
Cigarettes (only)	96.15	95.60	95.93	95.56	95.73	95.65	95.49	95.74
Pipes/Cigars	2.60	3.28	3.18	3.72	3.35	3.27	3.38	3.25
Mix	1.25	1.12	0.89	0.72	0.93	1.08	1.11	1.01
Zero	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. Number of daily smoked cigarettes, cigars or pipes not available for waves 1998, 1999 and 2001.

[40] Note that smoking intensity is defined as the average number of daily smoked CPD per smoker.

[41] A summary of the descriptive results can be found at the end of the section and in the Appendix in Table C1 to Table C4. They present mean smoking intensity by several socio-economic variables for several years and their respective change over time. Due to the limitations of the survey, as described in Section 3, all following values for smoking intensity in the years 1998 and 2001 are approximated numbers. For 1999, no data on average tobacco consumption are available. For some analyses, the earliest year available is 2002. Not all who declared themselves as smokers gave information about daily consumption. In 1998 and 2001, about 1% gave no information about daily consumption. Between 2002 and 2012, about 3 to 5.5% of smokers gave no information.

[42] See Section 3.

exclusively smoked cigarettes, those who smoked either pipes or cigars or both and those who had a mixed consumption, that is, smokers who smoked cigarettes but also either pipes or cigars or both. Unfortunately, no data before 2002 is available.[43] In all years, about 96% of all smokers consumed exclusively cigarettes. The percentage was relatively constant over time. Together with those smokers who had a mixed consumption (about 1% of smokers), about 97% of all smokers smoked cigarettes on a daily basis. For the following analysis of smoking intensity, only cigarette consumption is considered.

Table 6: Summary statistics for smoker types in 2002, 2006 and 2014

	Smoker Type			
	Cigarettes	**Cigars/Pipes**	**Mix**	**All**
	Mean			
2014				
Age (Years)	45.72	55.35	45.67	46.20
Education in Years	11.53	12.46	10.81	11.55
Equivalent Income (€)	20,526.14	27,194.35	17,932.99	20,808.94
2006				
Age	42.32	51.90	49.25	42.86
Education in Years	11.31	12.72	11.66	11.36
Equivalent Income (€)	18,847.94	25,176.12	18,089.76	19,006.68
2002				
Age	42.04	54.26	49.80	42.47
Education in Years	11.30	12.75	11.00	11.34
Equivalent Income (€)	17,668.21	24,361.84	17,886.23	17,851.07

Note: SOEP waves 2002, 2006 and 2014. Unbalanced Panel. Data weighted by expansion factors supplied in the data set.

Table 6 displays the mean age, education in years and net equivalent yearly household income for the three smoker types. In all three years, smokers who exclusively smoked cigars or pipes (or both) were older, better educated and had a higher income than smokers who exclusively smoked cigarettes or had a mixed consumption. In 2014, the average cigar/pipe smoker was 55 years old, had about 12.5 years of education and had an equivalent household income of 27,194 Euro. In comparison, the average cigarette smoker was 46 years old, had about 11.5 years of education and had an equivalent household income of 20,526 Euro.

5.1 Distribution of Daily Smoked Cigarettes

The following analysis concentrates on possible factors which lead to the lower overall smoking intensity.

Table 7 presents mean and median smoking intensity from 1998 through 2014. Both median

[43] As described in Section 3, in the survey years between 2002 and 2012, the SOEP provides not only information about average daily cigarette consumption, but also information about average daily pipe and cigar consumption.

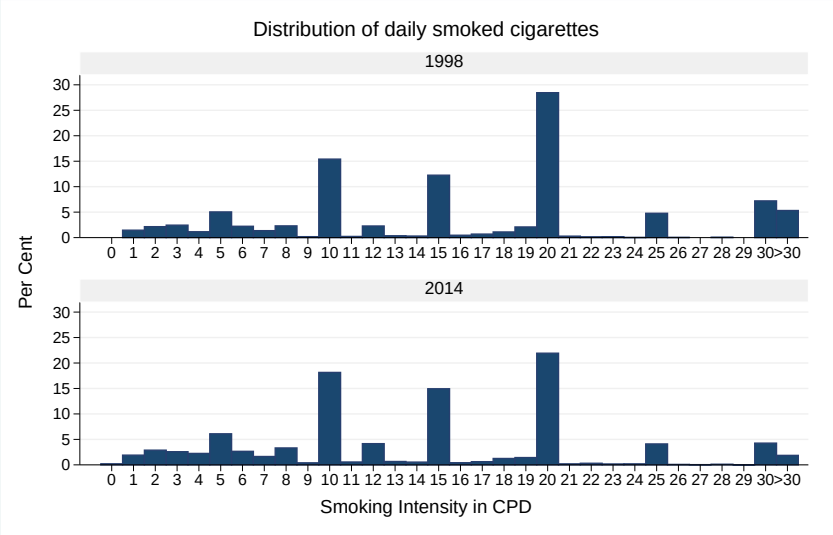
Table 7: Smoking intensity (CPD) in Germany from 1998 through 2014

	Years									
	1998	**2001**	**2002**	**2004**	**2006**	**2008**	**2010**	**2012**	**2014**	**Total**
	Smoking Intensity in CPD									
Median	16.98	17.92	18.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
Mean	16.81	16.84	17.04	16.34	15.87	15.33	15.03	14.64	14.33	15.85

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = Cigarettes per day. Smoking intensity is defined as the average number of CPD per smoker. For 1998 and 2001, the number of CPD are approximated. No numbers of CPD available for wave 1999.

and mean smoking intensity fell.[44] However, the relationship between median and mean varied over time, which implies that the distribution of cigarette consumption changed. First, for the years 1998, 2001 and 2002, the median was higher than the mean. This means that there was a large proportion of smokers who had a high cigarette consumption. In 2004 and 2006, the mean was higher and from 2008, median and mean was approximately the same. Because the mean and median were close, it implies that the consumption of cigarettes was approximately evenly distributed.

Figure 17: Distribution of daily smoked cigarettes (CPD) in 1998 and 2014



Note: SOEP waves 1998 and 2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = cigarettes per day. For 1998, the number of CPD are approximated.

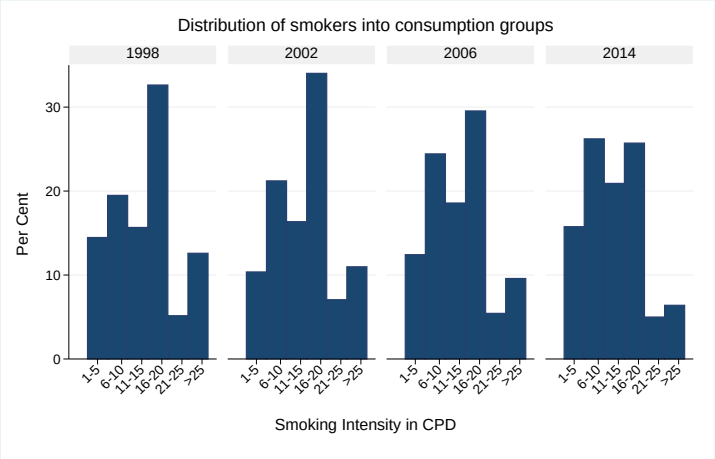
Figure 17 displays the distribution of average daily smoked cigarettes in 1998 and 2014. In 2014, there were less smokers with a high daily cigarette consumption. For example, while

[44]The odd values of median smoking intensity in the years 1998 and 2001 are a result of the necessary approximation of the numbers of daily smoked cigarettes in the two years (see Chapter 3).

in 1998, about 5% of smokers had a consumption higher than 30, in 2014 only 2% did. We also observe the so-called 'heaping' of self-reported cigarette consumption.[45] Cigarette consumption accumulates at multiplies of five.

The reduced share of smokers with a high consumption can explain part of the overall decline in smoking intensity. To assess this point in more detail, we form six consumption groups according to average daily smoking intensity. A redistribution of smokers into lower consumption groups could explain the decrease in smoking intensity.

Figure 18: Distribution of smokers by consumption group



Note: SOEP waves 1998, 2002, 2006 and 2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = cigarettes per day. Smoking intensity is defined as average number of CPD per smoker. For 1998, the number of CPD is approximated.

Figure 18 displays the distribution of smokers according to daily cigarette consumption in 1998, 2002, 2006 and 2014. Indeed, there was a substantial redistribution of smokers into groups with lower daily cigarette consumption.[46] The share of smokers with a lower consumption had been increasing consistently since 1998. In 2014, most smokers consumed between 6 and 10 CPD. In contrast, in all other years, most smokers consumed between 16 and 20 CPD.

Simultaneously, the share of heavy smokers declined. Heavy smokers are smokers who smoke more than 20 CPD.[47] In 1998 and 2002, about 18% of smokers were heavy smokers. In 2006 and 2014, only about 15% and 11% were heavy smokers.[48]

[45] See Wang and Heitjan (2008).

[46] For a more detailed depiction of the distribution of average daily cigarette consumption see Table C14 in the Appendix.

[47] The definition of 'heavy smoker' follows the recommendation of the German Federal Statistical Office and of the World Health Organization (see `https://www.gbe-bund.de/gbe10/abrechnung.prc_abr_test_logon?p_uid=gast&p_aid=0&p_knoten=FID&p_sprache=E&p_suchstring=7974`).

[48] For more information about the development of the percentage of heavy smokers and detailed descriptive statistics see Section 5.3 and in particular Table 11.

Table 8: Transition matrix between consumption groups (in CPD) from 2002 through 2014

CPD in 2002	Smoking Intensity (CPD) in 2014							
	1–5	**6–10**	**11–15**	**16–20**	**>20**	**Quitters**	**Total**	**N**
	In Per Cent							
1–5	30.76	13.38	6.15	2.60	0.74	46.37	100.00	232
6–10	9.72	31.67	12.11	4.57	0.65	41.29	100.00	458
11–15	5.01	19.50	28.52	17.56	3.39	26.02	100.00	402
16–20	2.54	13.74	20.20	29.69	9.20	24.64	100.00	671
>20	0.66	5.27	5.05	28.68	32.16	28.17	100.00	361
N	138	378	339	410	178	681	2,124	

Note: SOEP waves 2002 and 2014. Balanced Panel. Data weighted by expansion factors supplied in the data set. CPD = Cigarettes per day. Quitters are defined as smokers, who quit smoking during the period of observation and did not relapse. Sample size (N) not weighted.

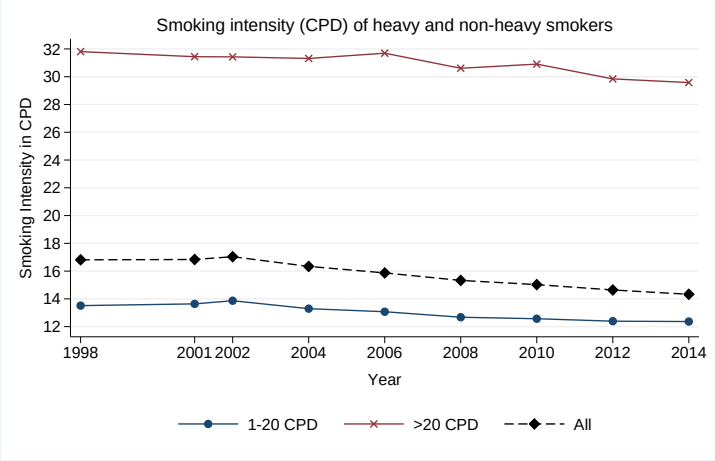
The reduced share of heavy smokers could had been caused by one, former heavy smokers smoking less or two, by former heavy smokers quitting to smoke. Table 8 presents a transition matrix of five consumption groups between 2002 and 2014. The table displays how much a smoker smoked in 2002 and how much he or she smoked in 2014. About 28% of former heavy smokers stopped smoking and about 40% reduced their cigarette consumption so that they switched to a lower consumption group.[49] In contrast, there were only 14% 'new' heavy smokers coming from lower consumption groups. In sum, the lower fraction of heavy smokers was caused both by heavy smokers reducing their consumption and also by heavy smokers quitting to smoke.

There was a time consistency in smoking intensity, which means that if a person still smoked in 2014, he or she most likely consumed the same amount as in 2002. For example, of the smokers who smoked between 1 and 5 CPD in 2002, for example, about 31% still smoke the same amount in 2014. The most stable consumption group were heavy smokers. 32% of heavy smokers in 2002 were still heavy smokers in 2014. In addition, smokers were more likely to switch to a neighbouring consumption group than to a substantially higher or lower consumption group. Noteworthy is the high fraction of smokers who quit smoking and previously smoked between 1 and 5 (46%) or between 6 and 10 cigarettes (41%) in 2002. In contrast, among smokers with a smoking intensity higher than 10, the fraction of quitters was substantially lower.[50]

[49]Here, 2002 instead of 1998 is chosen as a reference year to secure a bigger sample size. See Section 3 for more information.

[50]Table C12 and Table C13 in the Appendix display the transition probabilities more detailed in two year steps. We observe the same pattern, that is, consumption was stable over time and that even more distinct in the shorter periods than over the whole period of twelve years. In all years, heavy smokers were the least likely to switch to another consumption group and smokers with low consumption had the highest share of quitters.

Figure 19: Time series of smoking intensity (CPD) of heavy and non-heavy smokers



Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = Cigarettes per day. Smoking intensity is defined as the average number of CPD per smoker. For 1998 and 2001, the number of CPD are approximated. No numbers of CPD available for wave 1999.

So far we have observed that there were less heavy smokers, because heavy smokers either stopped smoking or reduced their consumption and were then categorised as non-heavy smokers. Now, the question arises whether smokers with an already low consumption also did reduce their consumption. In particular, did both heavy smokers (CPD>20) and non-heavy smokers (CPD<21) smoke less?

Figure 19 depicts the times series of smoking intensity for all smokers, for heavy and non-heavy smokers. Smoking intensity declined by about 15% (see Table C4 in the Appendix). Heavy smokers reduced their smoking intensity only slightly less than non-heavy smokers. Average consumption of heavy smokers fell by about 7%, consumption of non-heavy smokers by 8.5%. Yet, considering only the period from 2002 through 2014, the decline in consumption of heavy and non-heavy smokers differed substantially. Heavy smokers reduced their cigarette consumption by only 6%, whereas non-heavy smokers reduced it by about 11%, thus, nearly twice as much.

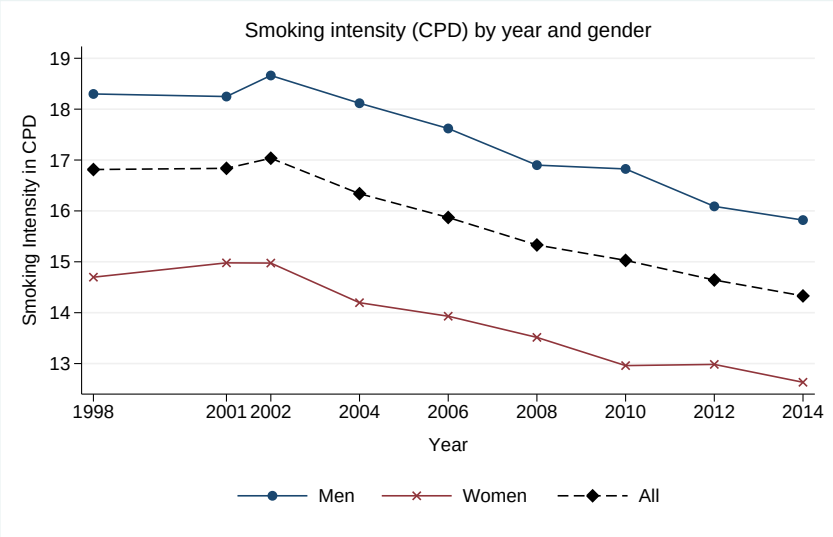
For women, we observe the same development (see Table C8 in the Appendix). Average consumption of female heavy smokers fell by about 7%, while consumption of female non-heavy smokers fell by 11%. Among male smokers, there was no major difference in the decline in consumption between heavy and non-heavy smokers. Both reduced their consumption by about 7% (see Table C10 in the Appendix). In sum, both heavy and non-heavy smokers reduced their consumption and the share of heavy smokers declined substantially, which both can explain the decline in smoking intensity.

5.2 Socio-economic Factors

This section examines whether the decline and level of smoking intensity differed substantially between socio-economic groups. The section follows the structure of Section 4.

5.2.1 Gender and Age

Figure 20: Time series of smoking intensity (CPD) from 1998 through 2014



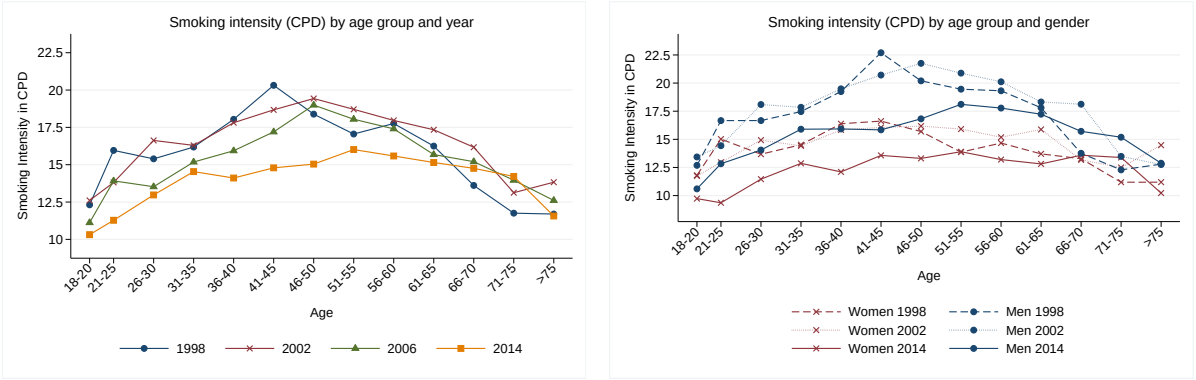
Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = Cigarettes per day. Smoking intensity is defined as the average number of CPD per smoker. For 1998 and 2001, the number of CPD are approximated. No numbers of CPD available for wave 1999.

Figure 20 displays the time series of smoking intensity for both genders from 1998 through 2014. The black dashed line is the time series of smoking intensity in the whole population. There was no major difference in the development of smoking intensity between men and women. Smoking intensity of both female and male smokers declined from 1998. In all years, smoking intensity of male smokers was on average substantially higher than the one of female smokers. Other surveys find similar results. Based on the Federal Health Survey (BGS98) of 1998, male smokers had an average consumption of 19.6 and female smokers of 15.8 CPD.[51] The Telephone Health Survey (GSTel03) of 2003 reports that male smokers on average smoked 18 and female smokers 14.3 CPD.[52]

Figure 21 Panel (a) depicts smoking intensity for 1998, 2002, 2006 and 2014 all by age group. The blue line depicts smoking intensity in 1998, the red in 2002, the green in 2006 and the

[51] See Junge and Nagel (1999).
[52] See Lampert and Burger (2005b).

Figure 21: Smoking intensity (CPD) by age group, year and gender



(a) Overall (b) Women, Men

Note: SOEP waves 1998, 2002, 2006 and 2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = cigarettes per day. Smoking intensity is defined as average number of CPD per smoker. For 1998, the number of CPD is approximated. Due to sample size, smoking intensity of 1910–29 birth cohort is not depicted after 2006.

orange in 2014. Panel (b) depicts smoking intensity for women and men by age group.[53] All smokers, both female and male, who were younger than 66, reduced their cigarette consumption. The decline in smoking intensity was higher among younger age groups (< than 50). Smokers aged between 21 and 25 reduced their consumption most (see also Table C1 in the Appendix).

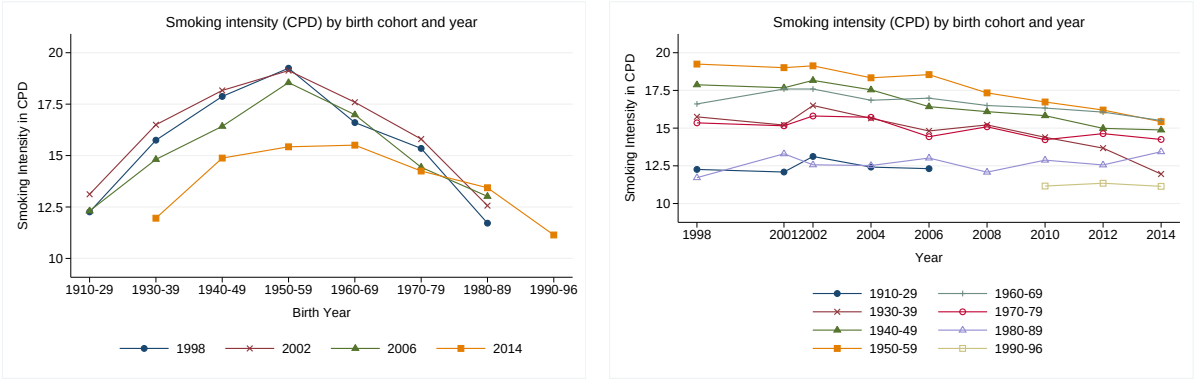
Smoking intensity for both genders and across age groups smoothed between 1998 and 2014. In 2014, smoking intensity followed a specific pattern across age groups. It increased steadily up to age 35, after which it remained relatively constant up to 55 and then declined in older age groups. The highest smoking intensity was observed between 51 and 60. After 75, there was a substantial decrease in smoking intensity. Such a decline did not occur in the other years. Smoking intensity followed a slightly different pattern across age groups than smoking prevalence. Smoking prevalence was relatively constant between 21-to-60-year-olds and then was lower in older age groups, whereas smoking intensity increased up to age 35, remained stable between 36 and 55 and then was lower in older age groups. Comparing women and men in 2014, in each age group, women had a lower smoking intensity than men.

As pointed out in Section 4.1, it is often helpful to consider birth cohorts in addition to age groups in an analysis over time. Such analysis may be confusing, because age groups are not fixed over time.

Figure 22 Panel (a) depicts smoking intensity for 1998, 2002, 2006 and 2014 all by birth cohort. In 1998, 2002 and 2006, there was a clear pattern in smoking intensity across birth

[53] For simplicity, only the years 1998, 2002 and 2014 are depicted for women and men. All values are presented in Table C7 and Table C9 in the Appendix.

Figure 22: Smoking intensity (CPD) by birth cohort and year



(a) (b)

Note: SOEP waves 1998, 2002, 2006 and 2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = cigarettes per day. Smoking intensity is defined as average number of CPD per smoker. For 1998, the number of CPD is approximated. Due to sample size, the smoking intensity of the 1910–29 birth cohort is not depicted after 2006.

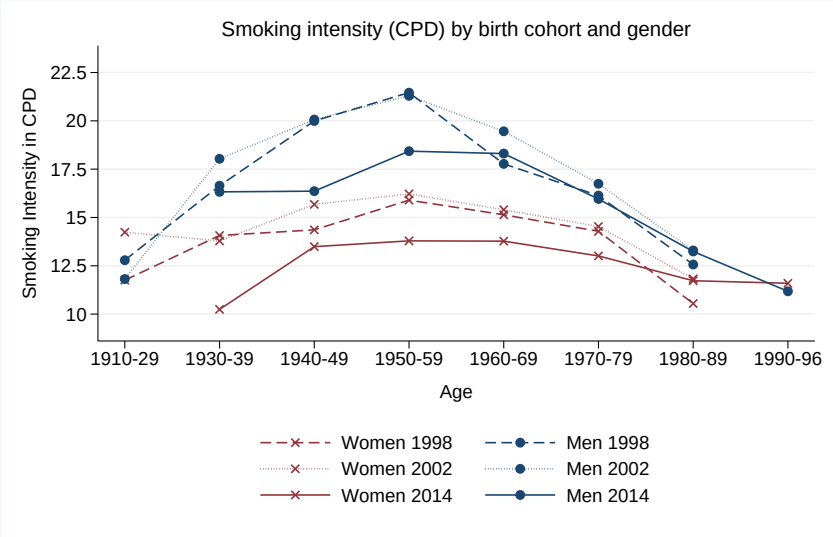
cohorts. Smoking intensity increased consistently up to the 1950–1969 birth cohort, for which it reached a peak and then was lower in younger birth cohorts. In 2014, the pattern of smoking intensity across cohorts was smoother. Smoking intensity of the cohorts 1940 to 1969 is roughly the same. In comparison, smoking prevalence, increased up to the 1950–1969 birth cohort, but then was relatively stable for younger cohorts while smoking intensity declined. Thus, *smoking prevalence* and *smoking intensity* developed differently across generations.

Figure 22 Panel (b) displays the time series of smoking intensity for each birth cohort. Each cohort born before 1979 reduced its cigarette consumption. In contrast, the 1980–1989 cohort increased it. But in 1998, the 1980–1989 birth cohort consisted only of individuals aged 18. Smoking intensity was on average low for young smokers, which probably explains the low smoking intensity of this cohort in 1998 and subsequent years (see also Table C5). The decline in smoking intensity was higher for older birth cohorts (born before 1960). Especially smokers born between 1930 and 1939 reduced their consumption (see also Table C1). Yet, in 2014, this cohort, was aged between 75 and 84. The substantial decline in smoking intensity of the 1930–1939 cohort was more likely an age effect. Smoking intensity declined considerably after age 75 (see Figure 21). The second biggest decline in smoking intensity can be observed for smokers born between 1950 and 1959.

Linking the analysis across cohorts with the one across age groups, the birth cohorts from 1940 to 1959 play an important role in explaining the high smoking intensity in older age groups in recent years. In 1998, smoking intensity in the 1940–59 birth cohort was relatively high. In 1998, this cohort was aged between 39 and 58. As depicted in Figure 21, smoking intensity in

these age groups was relatively high. Over time, smokers in the 1940–59 birth cohort shifted to older age groups, which caused relatively high smoking intensity in these age groups.

Figure 23: Smoking intensity (CPD) by birth cohort and gender



Note: SOEP waves 1998, 2002, 2006 and 2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = cigarettes per day. Smoking intensity is defined as average number of CPD per smoker. For 1998, the number of CPD is approximated. Due to sample size, the smoking intensity of the 1910–29 birth cohort is not depicted after 2002.

Figure 23 depicts smoking intensity for both genders by birth cohort in 1998, 2002 and 2014. Examining the development of smoking intensity separately for women and men yields no new findings. Male smokers smoked more than female smokers across all birth cohorts. Only in the cohort 1990 to 1996, smoking intensity was about the same.

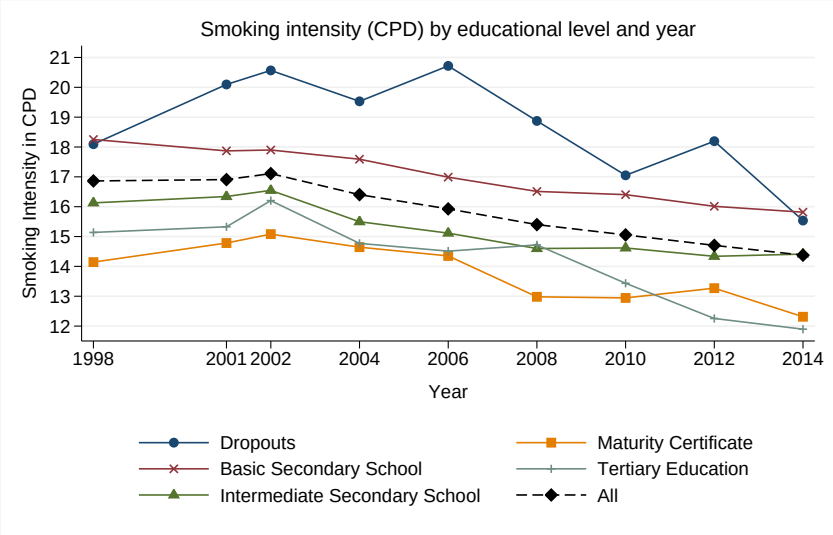
5.2.2 Education

Figure 24 displays the time series of smoking intensity for five educational levels from 1998 through 2014. The black dashed line is the time series of smoking intensity in the whole population. Between 1998 and 2014, smoking intensity declined across all educational levels. In particular, smokers with tertiary education reduced their consumption, namely by about 21% (see also Table C2 in the Appendix). In comparison, smokers with an intermediate educational level reduced their consumption by about 11%.

In all years, smokers with the two lowest educational levels had the highest smoking intensity and smokers with the two highest educational levels had the lowest. In fact, on average, the lower the educational attainment of a smoker was, the higher was the average smoking intensity. *Smoking intensity* had therefore a slightly different relationship to education than *smoking*

prevalence. Considering only those with a finished degree, smoking prevalence was highest among those with an intermediate educational level, whereas smoking intensity was highest among smokers with a basic educational level (see Figure 10). Nevertheless, on average, both smoking prevalence and intensity was highest among school dropouts.

Figure 24: Time series of smoking intensity (CPD) by educational level



Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = Cigarettes per day. Smoking intensity is defined as the average number of CPD per smoker. For 1998 and 2001, the number of CPD are approximated. No numbers of CPD available for wave 1999. Basic Secondary = Hauptschulabschluss; Intermediate = Realschulabschluss; Maturity Cert.= Abitur; Tertiary Educ. = Uni-/ Fachhochschulabschluss. Respondents still in school are excluded.

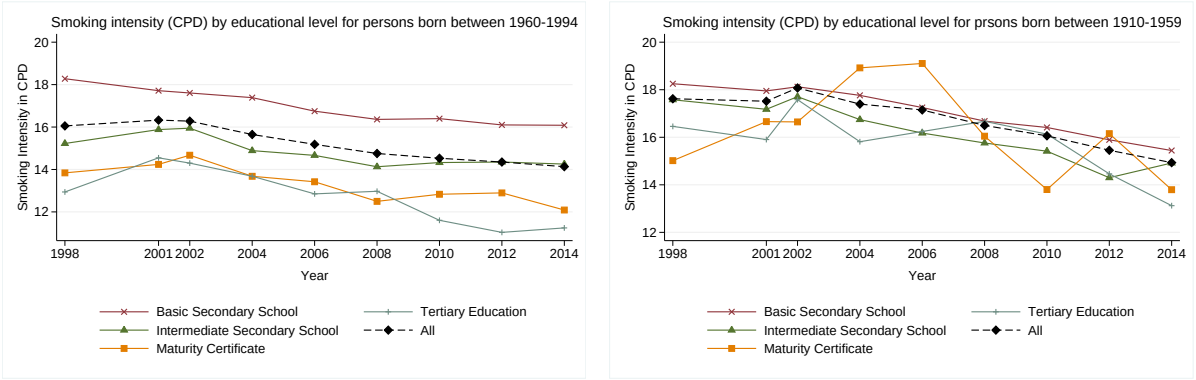
As already shown in Section 4.2, the relationship between educational level and smoking behaviour varied significantly between age groups and cohorts. In line with the analysis of smoking prevalence, the sample was split according to birth year.

Figure 25 Panel (a) depicts the time series of smoking intensity for five educational levels for persons born between 1960 and 1996, Panel (b) for those born between 1910 and 1959. Smoking intensity in the different educational groups developed similarly across cohorts. Both among younger (born between 1960–1996) and older cohorts (born between 1910–1959), smoking intensity decreased in each educational group (see Table C11 in the Appendix). Smoking intensity of older cohorts with maturity certificate was very volatile, because the sample size was relatively small.[54]

However, there were differences in the level of consumption in the educational groups

[54]In 2010, only 72 persons of those born before 1960 and having a maturity certificate reported their cigarette consumption.

Figure 25: Time series of smoking intensity (CPD) by educational level and birth cohort



(a) Born between 1960–1996 (b) Born between 1910–59

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = Cigarettes per day. Smoking intensity is defined as the average number of CPD per smoker. For 1998 and 2001, the number of CPD are approximated. No numbers of CPD available for wave 1999. Basic Secondary = Hauptschulabschluss; Intermediate = Realschulabschluss; Maturity Cert.= Abitur; Tertiary Educ. = Uni-/ Fachhochschulabschluss. Respondents still in school are excluded. Due to sample size, school dropouts are excluded.

between cohorts. For younger cohorts, it applied that the lower the educational attainment was, the higher was the smoking intensity. For older cohorts, smoking intensity does not differ much across educational levels. This finding becomes even more apparent in a detailed cohort analysis.

Figure 26 depicts smoking intensity for six birth cohorts by educational level in 1998, 2006 and 2014. The blue bars depict smoking intensity in 1998, the red bars in 2006 and the green bars in 2014. Just as with smoking prevalence, a social gradient in smoking intensity can only be observed among younger generations.

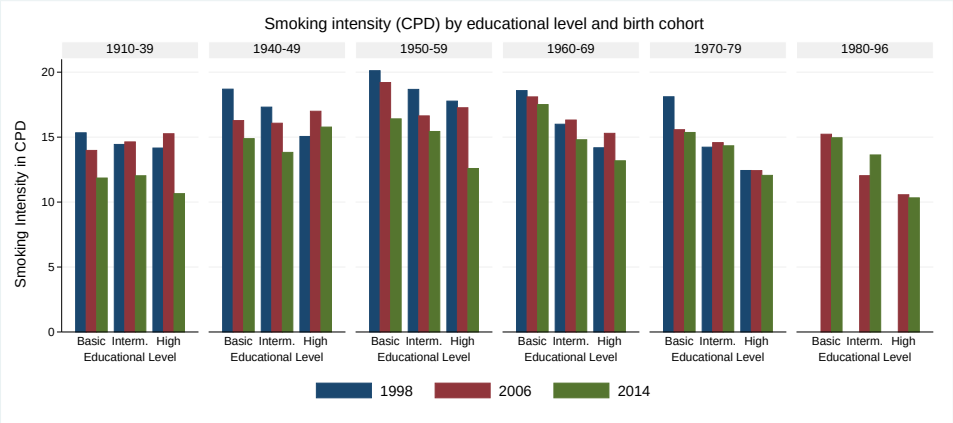
5.2.3 Income, Job, Marital Status and Region

Besides educational groups, in Section 4.3, we have also observed that income groups, occupational positions and marital states differed in their smoking rate and its development. In consequence, we assess whether this is also true for smoking intensity.

Figure 27 displays the times series of smoking intensity by income quartile from 1998 through 2014. The black dashed line is the time series of smoking intensity in the whole population. Smoking intensity decreased in all income quartiles.[55] In accordance with smoking prevalence (see Figure 15), we find that the higher the income was, the higher was the decline in smoking intensity (see also Table C2). Yet, whereas smoking prevalence among those in the lowest income quartile did not decline, smoking intensity did decline in the lowest quartile. Moreover,

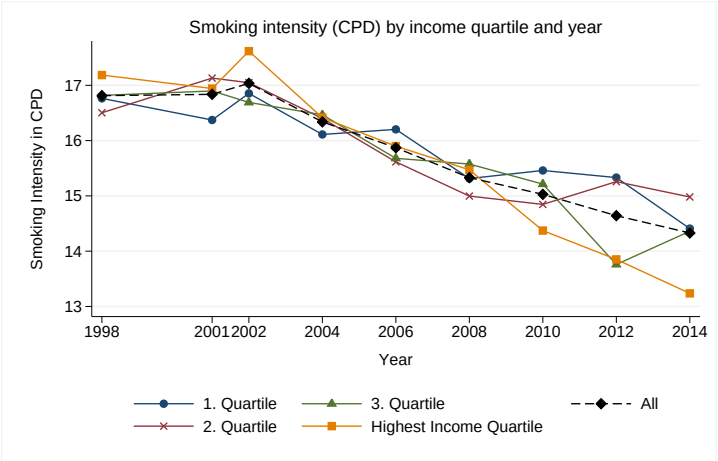
[55]The net equivalent household income was used for the analysis.

Figure 26: Smoking intensity (CPD) by educational level and birth cohort in 1998, 2006 and 2014



Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = Cigarettes per day. Smoking intensity is defined as the average number of CPD per smoker. For 1998 and 2001, the number of CPD are approximated. No numbers of CPD available for wave 1999. Respondents still in school are excluded. Due to sample size respondents with a maturity certificate and respondents with a tertiary education are combined and school dropouts excluded. Basic = Basic secondary school; Interm. = Intermediate secondary School; High = Maturity certificate or tertiary education.

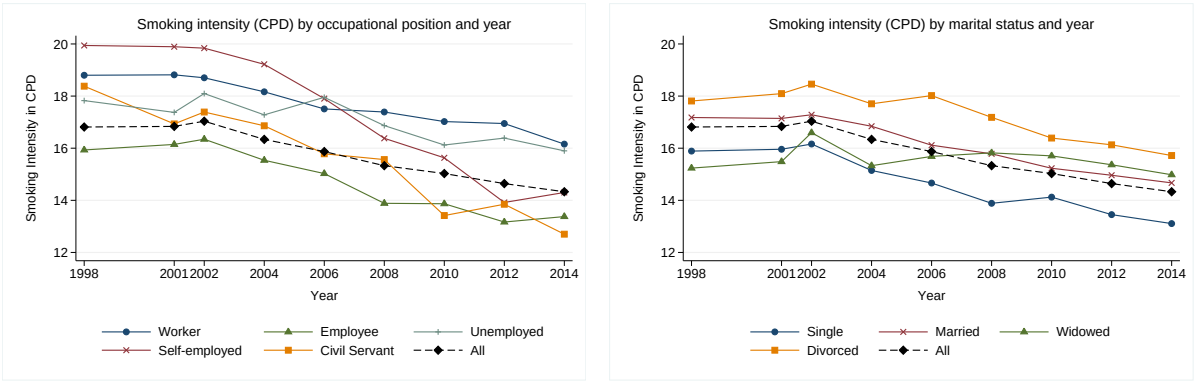
Figure 27: Time series of smoking intensity (CPD) by income quartile (net equivalent household income)



Note: SOEP waves 1998, 2002, 2006 and 2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = cigarettes per day. Smoking intensity is defined as average number of CPD per smoker. For 1998, the number of CPD is approximated.

whereas in all years, smoking prevalence was the highest among the lowest income quartile, smoking intensity was not. In 1998, smoking intensity was more or less the same across income quartiles (see Table C5). In 2014, only the smoking intensity of the highest income quartile was substantially lower than of the other income groups. Income disparities did not play such an important role in smoking intensity as in smoking prevalence.

Figure 28: Smoking intensity (CPD) by occupational position and marital status



(a) Occupational Position (b) Marital Status

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = Cigarettes per day. Smoking intensity is defined as the average number of CPD per smoker. For 1998 and 2001, the number of CPD are approximated. No numbers of CPD available for wave 1999. Respondents still in school are excluded. Due to sample size, school dropouts are excluded.

Figure 28 Panel (a) displays the times series of smoking intensity by occupational position. The development of smoking intensity differed between occupational positions. Even though smoking intensity decreased in all occupation groups, the magnitude of the decrease differed substantially. Self-employed people and civil servants reduced their cigarette consumption most (see Table C4). In 1998, self-employed people had the highest average smoking intensity, in 2014, they had one of the lowest. Indeed, smoking prevalence likewise decreased most among self-employed people and civil servants. In contrast, while smoking prevalence increased among unemployed people, smoking intensity decreased.

In 2014, workers and unemployed people smoked the most. Incidentally, among workers and unemployed people also smoking prevalence was relatively high compared with other occupational groups.

Figure 28 Panel (b) displays the times series of smoking intensity by marital status. The results of the influence of marital status on smoking intensity resemble generally those for smoking prevalence (Figure 16). Smoking intensity decreased for all smokers, independent of marital status, whereas smoking prevalence did not decrease among widowed people. Married smokers decreased their consumption most (see Table C4). In all years, smoking intensity was

highest among divorced people, among who also smoking prevalence was highest.

The development of smoking intensity in different regions in Germany can be found in the Appendix in Table C3. Smoking intensity fell consistently in East Germany as well as in West Germany. In comparison, smoking prevalence declined only in West Germany and remained on the same level in East Germany. Moreover, in 2014, smoking intensity was higher in West Germany than in East Germany, whereas smoking prevalence was lower in West Germany than in East Germany.

In summary, smoking intensity differed substantially across gender, age, birth cohort, educational level, occupational position, marital status and income. The socio-economic characteristics of a smoker could gave an indication of how many cigarettes he or she most likely to smoked per day.

To assess this in more detail, smokers were separated according to their smoking intensity, that is, we constructed five consumption groups, starting at 1 to 5 CPD and going up to over 20 CPD. Table 9 presents the distribution of several socio-economic groups into these five consumption groups in 2014. Summary statistics show that male smokers had an average higher consumption than female smokers. In 2014, most male smokers consumed between 16 and 20 CPD, whereas most female smokers consumed between 6 and 10 CPD.

Age was also related to average cigarette consumption. Smoking intensity increased consistently up to mid-life and then was lower in older age groups. Younger smokers (18 to 30) and older smokers (> than 65) consumed most likely 6 to 10 CPD, smokers aged between 31 and 65 had a higher consumption, namely between 16 and 20 CPD.

Smoking intensity also differed between birth cohorts. It increased up to the 1950–1969 birth cohorts, for which it reached a peak and then was lower for younger cohorts. Smokers born between 1910 and 1939 and between 1980 and 1996 consumed most likely between 6 and 10 CPD, whereas smokers born between 1940 and 1979 most likely consumed 16 to 20 CPD.

Lower educational attainment indicated a higher smoking intensity. Less educated people (basic level) most likely smoked between 16 and 20 CPD. More highly educated people (maturity certificate or tertiary education) smoked most likely between 6 and 10 CPD.

Furthermore, summary statistics show that smokers with a lower income tended to have a higher smoking intensity. But the distribution of smokers into consumption groups did not differ across income quartiles. Smokers in each income quartile consumed most likely either 6–10 or 16–20 CPD.

With regard to occupational position, we observe that workers and unemployed people

Table 9: Socio-economic groups by smoking intensity in 2014

	Smoking Intensity (CPD) in 2014					
	1–5	**6–10**	**11–15**	**16–20**	**>20**	**Total**
	In Per Cent					
Gender						
Women	19.52	31.92	21.12	19.84	7.59	100.00
Men	12.45	21.21	20.73	30.87	14.74	100.00
Age Group						
18–30	22.16	32.12	20.23	17.64	7.84	100.00
31–45	16.27	24.10	19.78	28.25	11.59	100.00
46–65	13.05	23.78	21.72	28.10	13.35	100.00
>65	13.06	30.70	22.06	24.54	9.65	100.00
Birth Cohort						
1910–39	19.49	36.29	22.79	16.37	5.07	100.00
1940–59	11.68	25.33	23.56	26.56	12.88	100.00
1960–79	14.80	24.85	19.19	28.62	12.53	100.00
1980–96	20.88	28.17	20.73	21.39	8.83	100.00
Educational Level						
Basic Secondary School	9.53	24.93	22.75	27.55	15.23	100.00
Intermediate Secondary School	14.68	26.52	20.87	26.67	11.25	100.00
Maturity Cert. + Tertiary Educ.	26.10	27.73	18.00	22.85	5.31	100.00
Equivalent Income						
1st (Lowest) Quartile	15.24	26.61	21.01	25.13	12.01	100.00
2nd Quartile	12.39	27.01	20.81	25.70	14.08	100.00
3rd Quartile	15.30	24.39	24.10	25.43	10.78	100.00
4th (Highest) Quartile	21.98	26.80	16.77	27.12	7.33	100.00
Occupational Position						
Worker	11.24	22.55	19.33	30.68	16.19	100.00
Self-employed	19.21	21.19	23.40	27.57	8.63	100.00
Employee	17.79	28.19	21.58	24.28	8.17	100.00
Civil Servant	30.09	20.21	14.43	28.42	6.85	100.00
Unemployed	9.23	23.58	22.63	28.18	16.39	100.00
Marital Status						
Single	19.52	28.93	20.72	22.16	8.67	100.00
Married	16.13	24.45	20.06	26.77	12.59	100.00
Widowed	6.92	34.51	21.84	23.03	13.71	100.00
Divorced	9.31	23.39	24.13	30.33	12.84	100.00
Region						
West	15.07	25.80	20.47	26.37	12.28	100.00
East (with Berlin)	18.11	27.65	22.43	23.46	8.35	100.00
All	15.76	26.22	20.92	25.71	11.39	100.00

Note: SOEP wave 2014. Data weighted by expansion factors supplied in the data set. Basic Secondary School = Hauptschulabschluss; Intermediate Secondary School = Realschulabschluss; Maturity Cert. = Abitur; Tertiary Educ. = Uni-/ Fachhochschulabschluss.Persons still in school are excluded. Due to sample size persons with a maturity certificate and persons with a tertiary education are combined and school dropouts excluded.

had a higher smoking intensity than other occupational positions. In accordance with this observation, most workers and unemployed people had a daily cigarette consumption between 16 and 20. Self-employed people also consumed most likely between 16 and 20 CPD, employees and civil servants most likely between 6 and 10.

Smoking intensity also differed between marital status. Divorced and widowed smokers smoked on average more than single and married smokers. Divorced smokers smoked most likely between 16 and 20 CPD, but widowed smokers smoked mostly between 6 and 10. Single smokers smoked mostly between 6 and 10 CPD and married smokers between 16 and 10.

Regional differences suggest that smokers in West Germany consumed on average more cigarettes than smokers in East Germany. Smokers in West Germany consumed most likely between 16 and 20 CPD, whereas smokers in East Germany consumed most likely 6 and 10.

Table 10: Summary statistics for eight consumption groups in 1998, 2002, 2006 and 2014

	Smoking Intensity (CPD)								
	1–5	**6–10**	**11–15**	**16–20**	**1–15**	**>15**	**1–20**	**>20**	**All**
	Mean								
1998*									
Average CPD	3.85	9.52	14.49	19.78	9.38	24.00	13.51	31.98	16.81
Age (Years)	40.83	42.70	39.44	40.68	41.12	41.43	40.93	42.79	41.28
Education in Years	11.90	11.10	11.28	11.02	11.40	11.12	11.25	11.30	11.26
Equivalent Income (€)	16,588	16,179	15,382	15,483	16,099	16,041	15,851	17,213	16,062
2002									
Average CPD	3.67	9.22	14.23	19.70	9.73	23.77	13.87	31.43	17.04
Age (Years)	42.21	40.60	41.02	42.45	41.09	43.10	41.66	44.33	42.47
Education in Years	11.52	11.33	11.41	11.15	11.40	11.20	11.30	11.28	11.34
Equivalent Income (€)	18,324	17,447	17,382	17,161	17,615	17,716	17,426	18,764	17,851
2006									
Average CPD	3.56	9.18	14.21	19.59	9.60	23.67	13.07	31.69	15.87
Age (Years)	41.05	40.84	41.18	43.43	41.00	44.11	41.84	45.45	42.86
Education in Years	11.83	11.24	11.46	11.10	11.45	11.15	11.33	11.24	11.36
Equivalent Income (€)	20,649	17,871	17,811	18,154	18,473	19,298	18,362	21,548	19,007
2014									
Average CPD	3.49	9.14	14.20	19.71	9.38	22.75	12.37	29.62	14.33
Age (Years)	42.65	45.28	46.37	46.74	44.96	46.96	45.47	47.47	46.20
Education in Years	12.22	11.58	11.37	11.46	11.66	11.30	11.60	10.93	11.55
Equivalent Income (€)	22,770	20,446	19,739	20,624	20,774	20,025	20,730	18,671	20,809

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = Cigarettes per day. Smoking intensity is defined as the average number of CPD per smoker. For 1998 and 2001, the number of CPD are approximated. No numbers of CPD available for wave 1999.
*Due to the approximation of CPD, average CPD no longer are integers. Alternative groups are >0–5; >5–10; >10–15; >15–20; >20; >0–15; >15; >0–20; >20.

Table 10 presents summary statistics for eight consumption groups for 1998, 2002, 2006 and 2014. Overall, smoking intensity fell in all cigarette-consumption groups. The average age of a smoker increased. This increase can be observed in each consumption group. The size of the

increase depends on the average consumption. The higher the consumption was, the higher was the increase in average age. Smokers with a low smoking intensity tended to be younger than smokers with a high one. In 2014, the average smoker was 46 years old. Smokers in the lowest consumption group (1–5 CPD) were about 43 years old and smokers in the highest (>20 CPD) were about 47 years old. Thus, the age difference between the lowest and highest consumption group was substantial, namely about 5 years. In 1998, the age difference was only two years.

In 2014, smokers had on average 11.5 years of education. The average educational attainment was highest among the lowest consumption group (1–5 CPD) and the lowest among the highest one (>20 CPD). The educational disparity between the two consumption groups increased over the years; in 1998 it was only 0.6 years, in 2014, it was 1.3 years. The average net equivalent household income of the average smoker increased. We observe this increase in income in all consumption groups. Just as for age, the size of the increase in income depended on the volume of daily consumption, that is, the lower the smoking intensity was, the higher was the increase in income. Accordingly, in 2014, smokers with a low smoking intensity (1–5 CPD) had a considerable higher equivalent household income than smokers with a high smoking intensity (>20 CPD).

In summary, both heavy smokers and non-heavy smokers smoked less in 2014 than in 1998. Also, a redistribution of smokers from higher to lower cigarette-consumption groups took place. In 2014, the share of heavy smokers was smaller than in all previous years. The lower percentage of heavy smokers was mostly caused by heavy smokers reducing their consumption and thus switching to a lower consumption group.

Considering socio-economic factors, the decline in smoking intensity was mostly driven by a reduced consumption of smokers aged between 18 and 45, smokers born before 1960, highly educated smokers, smokers with high income, civil servants, married smokers and smokers who lived in West Germany. In contrast, considering only the age of a smoker, smoking intensity increased among smokers aged between 66 and 75.

In 2014, about 96% of all smokers exclusively smoked cigarettes. The average cigarette smoker consumed about 15 CPD, was 45 years old, had about 11.5 years of education and had a net equivalent household income of 1.500 Euro. Of all smokers, about 14% smoked between 1 and 5 CPD, 27% smoked between 6 and 10, 20% smoked between 11 and 15, 26% smoked between 16 and 20 and 13% smoked over 20 CPD. Heavy smokers had an average smoking intensity of about 30 CPD, which means that over one tenth of smokers smoked almost two packs of cigarettes per day.

With respect to gender, female smokers aged older than 20 smoked less than male smokers.

In addition, smoking intensity followed a specific pattern across age groups. Smoking intensity increased steadily up to mid-life, remained relatively stable between 46 and 65 and then was lower in older age groups. Likewise, smoking intensity followed a specific pattern across birth cohorts. Smoking intensity increased steadily up to the birth cohorts 1950–1969, for which it peaked, and then was lower in younger birth cohorts. The high smoking intensity of smokers born between 1950 and 1969 was responsible for the relative high smoking intensity of older age groups. In general, less educated smokers had a higher cigarette consumption independent of age. We find the same correlation for income. We observe that the lower the net equivalent household income was, the higher was the smoking intensity. Moreover, with regard to occupational position, workers smoked the most. Divorced smokers smoked more than single, married or widowed smokers. Also, smokers who lived in West Germany smoked more compared with those who lived in East Germany.

5.3 Heavy Smokers

Smoking intensity decreased, and this was partly induced by a decline in the percentage of smokers with a high smoking intensity, so-called heavy smokers (CPD>20). The following section tries to answer two questions. First, was the decrease of the share of heavy smokers larger among certain socio-economic groups? Second, was the probability to be a heavy smoker higher among certain socio-economic groups of smokers? Or in other words, did heavy smokers have particular characteristics in comparison to all smokers and did these characteristics change over time?

Table 11 presents the share of heavy smokers among smokers by socio-economic groups in 1998, 2002, 2006 and 2014. The share of heavy smokers declined by about 36%. In 1998, 18% of smokers smoked more than 20 CPD, in 2014 only 12% did. The share of heavy smokers decreased most among smokers who were male, aged between 18 to 45, highly educated, in the highest income quartile, married and working as civil servants. In contrast, the share of heavy smokers increased among smokers who were older than 65.

In 2014, the probability to be a heavy smoker was higher for smokers who were male, aged between 46 to 65, less educated, in the second lowest income quartile, living in West Germany, employed as workers or unemployed and widowed.

If one wants to determine special socio-economic characteristics of smokers, the findings above need to be interpreted with caution. Table 11, for example, depicts how many smokers with a basic secondary education smoked heavily and not how many heavy smokers had a basic secondary education. One has to consider the distribution of heavy smokers by socio-economic

Table 11: Share of heavy smokers and change in heavy smokers among smokers by socio-economic factors

	Year				Change		
	1998	2002	2006	2014	$\Delta 98-14$	$\Delta 02-14$	$\Delta 06-14$
	In Per Cent						
All	18.03	18.04	15.02	11.37	−36.95	−36.99	−24.32
Gender							
Women	11.24	11.43	9.28	7.58	−32.60	−33.73	−18.40
Men	22.80	23.26	20.20	14.70	−35.52	−36.80	−27.20
Age Group							
18–30	11.39	9.42	6.88	7.82	−31.32	−17.02	13.64
31–45	21.18	20.86	16.47	11.55	−45.47	−44.63	−29.90
46–65	21.77	22.16	20.92	13.34	−38.71	−39.78	−36.22
>65	8.54	11.98	10.72	9.63	12.80	−19.61	−10.19
Educational Level							
Dropouts	17.30	27.94	30.05	14.77	−14.64	−47.14	−50.86
Basic Secondary	21.89	19.97	16.73	15.21	−30.55	−23.87	−9.08
Intermediate	14.42	15.65	13.21	11.21	−22.22	−28.37	−15.11
Maturity Certificate	12.46	14.00	13.66	4.93	−60.43	−64.78	−63.88
Tertiary Education	17.73	17.76	14.94	5.61	−68.39	−68.45	−62.47
Equivalent Income							
1st Quartile	16.70	16.74	14.67	11.96	−28.36	−28.52	−18.42
2nd Quartile	16.66	18.01	14.08	14.05	−15.66	−21.97	−0.19
3rd Quartile	16.91	16.97	14.87	10.78	−36.24	−36.45	−27.51
4th Quartile	22.18	20.83	16.70	7.32	−66.99	−64.85	−56.16
Region							
East (with Berlin)	11.33	12.27	9.27	8.35	−26.31	−31.92	−9.94
West	19.83	19.60	16.53	12.25	−38.22	−37.49	−25.88
Occupational Position							
Worker	22.48	23.06	19.21	16.15	−28.15	−29.95	−15.90
Self-employed	28.43	26.07	21.80	8.62	−69.69	−66.95	−60.48
Employee	15.44	15.42	12.79	8.16	−47.16	−47.09	−36.20
Civil Servant	27.04	20.02	16.25	6.85	−74.66	−65.77	−57.84
Unemployed	16.48	19.86	20.94	16.31	−1.03	−17.88	−22.11
Marital Status							
Single	15.12	15.38	11.46	8.65	−42.79	−43.76	−24.50
Married	19.37	19.13	15.56	12.57	−35.10	−34.28	−19.22
Widowed	15.34	15.06	15.04	13.71	−10.61	−8.96	−8.84
Divorced	19.38	21.61	21.86	12.78	−34.05	−40.86	−41.54

Note: SOEP waves 1998, 2002, 2006 and 2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. Heavy smokers are defined as smokers with a consumption higher than 20 cigarettes. For 1998, the number of smoked cigarettes are approximated.

factors to determine special characteristics of heavy smokers.

Table 12 and Table 13 present socio-economic characteristics of heavy smokers from 1998 through 2014. To assess whether heavy smokers had special socio-economic characteristics compared with smokers in general, socio-economic characteristics of all smokers are also depicted in the respective upper panel.

For both heavy smokers and smokers, the share of women increased and a redistribution to older age groups took place. Especially the share of those older than 65 increased substantially among heavy smokers. Also, the share of persons with a low income and the share of dropouts increased more pronounced among heavy smokers. Among heavy smokers, the share of self-employed people increased and the share of unemployed people increased, whereas among smokers, both shares remained stable.

In 2014, most heavy smoker were male, aged between 46 and 65, less educated, in the lowest income quartile, employed as a worker and married. Compared to smokers, the share of men, less educated people, people with low income and unemployed people among heavy smokers was considerably high. In addition, as depicted in Table 14, the average heavy smoker was older, less educated and had a lower income than the average smoker.

Table 12: Socio-economic characteristics of heavy smokers

	Year									
	1998	**2001**	**2002**	**2004**	**2006**	**2008**	**2010**	**2012**	**2014**	**Total**
Smokers	**Gender**									
Women	41.30	43.19	43.19	44.03	46.25	45.25	45.55	45.45	45.61	44.39
Men	58.70	56.81	56.81	55.97	53.75	54.75	54.45	54.55	54.39	55.61
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Heavy Smokers										
Women	25.71	28.06	27.94	27.31	29.29	30.18	28.32	31.46	31.16	28.54
Men	74.29	71.94	72.06	72.69	70.71	69.82	71.68	68.54	68.84	71.46
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Age Group									
Smokers										
18–30	25.47	22.68	22.53	22.90	24.62	23.14	22.51	21.23	19.30	22.76
31–45	39.65	39.01	37.68	35.87	34.09	31.96	29.52	28.39	27.31	33.89
46–65	28.44	31.41	32.69	32.99	32.72	35.23	38.25	40.09	42.44	34.75
>65	6.43	6.89	7.11	8.24	8.57	9.68	9.71	10.30	10.95	8.60
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Heavy Smokers										
18–30	16.09	12.07	12.05	11.71	11.62	10.21	10.14	10.58	13.62	12.13
31–45	46.50	45.84	43.99	38.65	37.82	34.26	25.93	26.65	28.53	37.91
46–65	34.35	38.96	39.53	43.57	44.95	45.63	55.30	53.35	49.31	43.86
>65	3.06	3.13	4.44	6.07	5.61	9.90	8.64	9.42	8.54	6.10
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Educational Level									
Smokers										
Dropouts	3.23	2.50	2.77	3.00	3.35	3.27	3.61	3.22	3.46	3.15
Basic Secondary	47.47	46.09	46.72	44.87	43.01	44.28	40.92	40.18	39.56	43.78
Intermediate	29.38	30.06	30.27	30.89	32.61	31.74	32.99	33.40	32.74	31.52
Maturity Cert.	8.91	9.07	8.92	9.22	8.94	8.72	9.38	9.74	10.59	9.26
Tertiary Educ.	11.01	12.28	11.32	12.02	12.08	11.98	13.10	13.46	13.65	12.29
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Heavy Smokers										
Dropouts	3.08	3.64	4.39	4.63	6.56	6.15	6.89	5.93	4.68	4.96
Basic Secondary	56.96	53.90	51.90	55.00	46.68	52.80	49.93	50.81	52.15	52.49
Intermediate	23.14	25.45	26.23	24.23	27.79	25.76	28.63	29.60	32.18	26.54
Maturity Cert.	6.13	6.41	6.91	5.33	7.92	6.21	5.14	5.73	4.55	6.14
Tertiary Educ.	10.69	10.61	10.57	10.81	11.05	9.08	9.40	7.93	6.43	9.87
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. Heavy smokers are defined as smokers with a daily cigarette consumption higher than 20 cigarettes. For 1998 and 2001, the number of smoked cigarettes are approximated. No numbers of smoked cigarettes are available for wave 1999.

Table 13: Socio-economic characteristics of heavy smokers: continued

	Year									
	1998	**2001**	**2002**	**2004**	**2006**	**2008**	**2010**	**2012**	**2014**	**Total**
Smokers	**Income**									
1st Quartile	27.82	25.45	26.71	27.68	30.09	29.30	30.30	30.90	31.78	28.83
2nd Quartile	24.37	26.56	25.28	24.80	23.80	25.20	24.52	24.61	25.17	24.92
3rd Quartile	24.29	25.25	24.96	23.93	23.51	24.90	24.34	24.22	23.99	24.38
4nd Quartile	23.52	22.74	23.05	23.59	22.60	20.59	20.84	20.27	19.07	21.87
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Heavy Smokers										
1st Quartile	25.82	21.05	25.18	26.04	29.57	29.50	33.75	37.22	33.82	28.23
2nd Quartile	22.45	27.99	25.41	24.93	22.47	26.56	21.17	30.05	31.84	25.58
3rd Quartile	22.74	23.64	23.30	24.63	23.43	25.16	26.41	17.16	22.53	23.33
4nd Quartile	28.98	27.32	26.12	24.40	24.53	18.78	18.68	15.57	11.81	22.86
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Occupational Position									
Smokers										
Worker	36.22	36.01	35.82	32.24	31.56	35.55	32.76	28.82	27.85	33.05
Self-employed	7.88	8.95	7.56	9.04	8.81	7.35	7.50	7.39	7.29	7.99
Employee	36.28	38.47	38.02	38.01	38.27	39.64	40.83	45.11	46.22	40.00
Civil Servant	5.12	4.48	4.06	3.57	3.90	3.62	4.49	4.39	4.13	4.20
Unemployed	14.49	12.09	14.54	17.14	17.45	13.85	14.42	14.29	14.51	14.76
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Heavy Smokers										
Worker	41.26	40.42	42.17	40.46	35.57	47.87	41.69	44.19	38.96	41.30
Self-employed	11.33	12.70	9.58	10.35	10.91	6.51	7.17	4.45	5.17	9.23
Employee	28.36	30.31	29.54	28.13	28.40	24.69	31.06	28.49	32.73	28.95
Civil Servant	7.05	4.45	3.92	3.56	3.47	3.31	2.65	2.88	2.28	3.94
Unemployed	11.99	12.13	14.79	17.51	21.64	17.62	17.43	19.99	20.86	16.57
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Marital Status									
Smokers										
Single	27.97	30.09	30.96	33.18	34.23	34.53	34.70	34.02	34.80	32.66
Married	57.12	53.62	52.59	48.76	47.14	46.09	46.21	47.62	45.46	49.51
Widowed	4.17	4.51	4.41	4.68	4.29	4.41	4.12	4.11	4.30	4.34
Divorced	10.75	11.78	12.04	13.38	14.33	14.97	14.97	14.25	15.44	13.49
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Heavy Smokers										
Single	23.42	25.36	26.80	27.36	26.71	24.72	29.65	27.85	27.10	26.36
Married	61.56	58.08	55.15	53.48	48.28	51.16	46.98	49.07	49.95	53.38
Widowed	3.55	3.77	3.62	3.71	4.22	4.77	4.51	5.09	5.10	4.14
Divorced	11.47	12.80	14.44	15.46	20.79	19.35	18.85	17.99	17.85	16.12
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. Heavy smokers are defined as smokers with a daily cigarette consumption higher than 20 cigarettes. For 1998 and 2001, the number of smoked cigarettes are approximated. No numbers of smoked cigarettes are available for wave 1999.

Table 14: Summary statistics for heavy smokers in 2014

	Non-heavy Smoker	**Heavy Smoker**	**All Smoker**
		Mean	
Age (Years)	45.47	47.47	45.70
	(15.31)	(13.19)	(15.10)
Education in Years	11.60	10.93	11.53
	(2.62)	(1.97)	(2.56)
Equivalent Income	20,730.48	18,670.98	20,496.32
	(12,592.22)	(11,753.25)	(12,515.94)
No. of Kids in HH	0.43	0.41	0.43
	(0.84)	(0.85)	(0.84)

Note: SOEP wave 2014. Data weighted by expansion factors supplied in the data set. Heavy smokers are defined as smokers with a daily cigarette consumption higher than 20 cigarettes. Standard deviations in brackets.

6 Smoking Initiation and Cessation

This section examines smoking initiation (start/ pick up smoking) and smoking cessation (quit smoking) in the German population between 1998 and 2014. The first part of this section examines smoking initiation with a focus on socio-economic characteristics. The second part assesses whether there were factors that may influenced the decision to stop smoking.

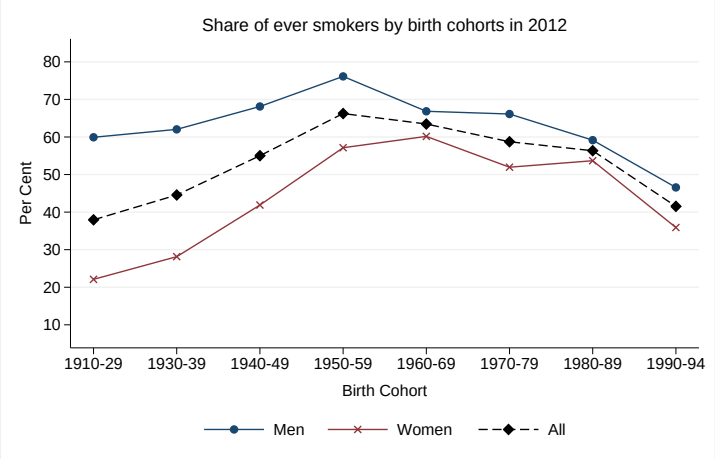
6.1 Smoking Initiation

As a measure for smoking initiation, we employ the share of ever smokers. An ever smoker is defined as a person who has smoked at least one hundred cigarettes or other tobacco products during the course of his life and declared to be a regular smoker at least at one point in his life.[56] A comparison of the share of ever smokers between older and younger birth cohorts determines whether less younger people started smoking. In addition, a comparison of the share of ever smokers between socio-economic groups determines whether socio-economic characteristics influence the probability to start smoking. We will also focus on the development of starting age. The most recent SOEP wave that contains the share of ever smokers and average starting age is from 2012.

Figure 29 displays the share of ever smokers for women and men by birth cohorts in 2012.[57] Among men, the share of ever smokers was the highest in the 1950–59 cohort (76%). Of those men, who in 2012 were aged between 53 and 62, three-quarters had once been or still were a regular smoker. Younger generations of men, those born after 1979, had a substantially lower share of ever smokers. Hence, the likelihood to start smoking declined for men.

[56] Note that the share of never smokers is calculated by the equation, $neversmokers = 1 - eversmokers$.
[57] See also Table D2 in the Appendix.

Figure 29: Share of ever smokers by birth cohort and gender in 2012



Note: SOEP wave 2012. Data weighted by expansion factors supplied in the data set. Ever smokers are defined as respondents who smoke or used to smoke on a regular basis.

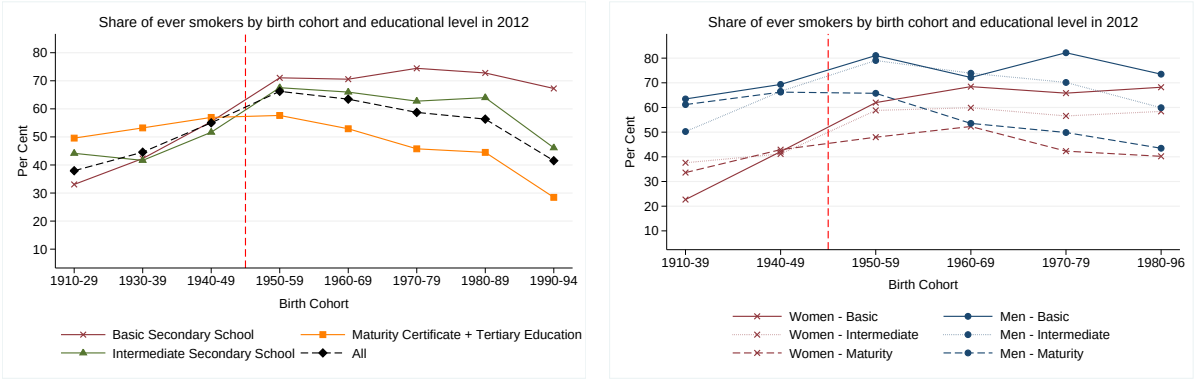
In contrast, the likelihood to start smoking increased for women. In 2012, younger generations of women, had a significantly higher share of ever smokers than older ones. Only among the 1990–94 cohort, the share was about the same as among older cohorts (born before 1950). Yet, women in this cohort were only aged between 18 and 22 in 2012 and might still have started smoking afterwards.

Whereas among older cohorts, the share of ever smokers was substantially lower among women than among men, in younger cohorts it was not. Consequently, the gap between genders in the share of ever smokers was smaller among younger cohorts than among older ones. This finding is in line with the one of Schulze and Lampert (2006). Yet, although the share of ever smokers had increased among women, in general, it was still lower than among men.

Figure 30 Panel (a) displays the share of ever smokers for three educational levels by birth cohorts in 2012. The red line depicts the share of ever smokers among people with a basic educational level, the green among those with an intermediate educational level and the orange among those with a maturity certificate or tertiary education. The black dashed line depicts the share of ever smokers among the whole population. Overall, there was an inversion of the educational gradient in smoking initiation. Older birth cohorts (born before 1950) had the highest share of ever smokers among those with a higher educational level, but younger cohorts (born after 1949) had the highest share of ever smokers among those with a lower educational level. Thus, for highly educated persons, the share of ever smokers declined across birth cohorts, for less educated persons, the share increased.[58] Moreover, educational inequalities among

[58] See also Table D1 in the Appendix.

Figure 30: Share of ever smokers by birth cohort, educational level and gender in 2012



(a) Overall (b) Women, Men

Note: SOEP wave 2012. Data weighted by expansion factors supplied in the data set. Ever smokers are defined as respondents who smoke or used to smoke on a regular basis. Basic = Basic, elementary secondary school; Intermediate = Intermediate secondary School; Maturity = Maturity Certificate. Sample does not include persons still in school and persons with no completed school degree. Due to sample size, persons with a maturity certificate and with a tertiary education are combined.

smokers increased, that is, younger birth cohorts showed a substantial difference in the share of ever smokers across educational levels, older cohorts did not. Both observations are in line with a social gradient in smoking for younger generations.[59]

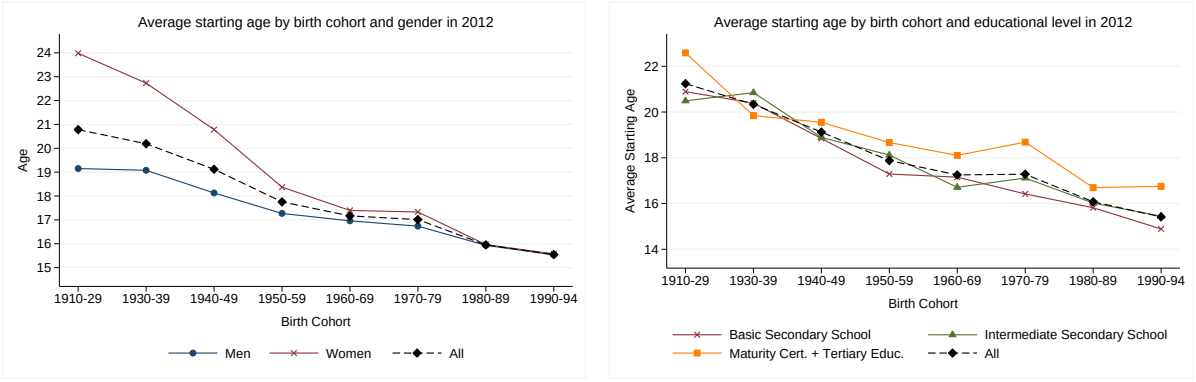
Figure 30 Panel (b) displays for both genders the share of ever smokers for three educational levels by birth cohorts in 2012. The difference between educational groups in their share of ever smokers across birth cohorts varied between men and women. Among women, there was a change in the relationship between smoking and educational level across generations, although not as evident as combined for both genders. Among older generations of women, the share of ever smokers was higher among those who were better educated, whereas among younger generations, it was higher among those who were less educated. In contrast, among men, there was no change in the relationship between smoking and educational level. The share of ever smokers was higher among less educated men across all cohorts.

The social gradient in smoking in younger generations can be also observed when, instead of educational level, income inequalities are considered (see Table D1 in the Appendix). In accordance with educational level, there was a change in the correlation of income and smoking initiation between younger and older birth cohorts. Whereas among older cohorts, the share of ever smokers was higher in higher income quartiles, among younger cohorts, the share was higher in lower ones. However, the difference in the share of ever smokers across income quartiles was not as pronounced as across educational levels.

[59] As proposed by Schulze and Lampert (2006).

6.2 Starting Age

Figure 31: Average smoking starting age by birth cohort, gender and educational level in 2012



(a) Gender (b) Educational level

Note: SOEP wave 2012. Data weighted by expansion factors supplied in the data set. Ever smokers are defined as respondents who smoke or used to smoke on a regular basis. Sample does not include persons still in school and persons with no completed school degree. Due to sample size persons with a maturity certificate and persons with a tertiary education are combined.

Figure 31 Panel (a) depicts the average age at which a person started smoking for men and women by birth cohorts in 2012. The black dashed line depicts the average starting age of all smokers. The average age at which a person started smoking dropped from 21 to 16. On average, smokers born between 1910 and 1929 started smoking at 21; smokers born between 1980 and 1994 started smoking at 16.[60] Among women, the development was even more distinctive. The average starting age of women fell from 24 to 16. Men had used to start smoking earlier than women, but in younger cohorts there was no age difference in smoking initiation.

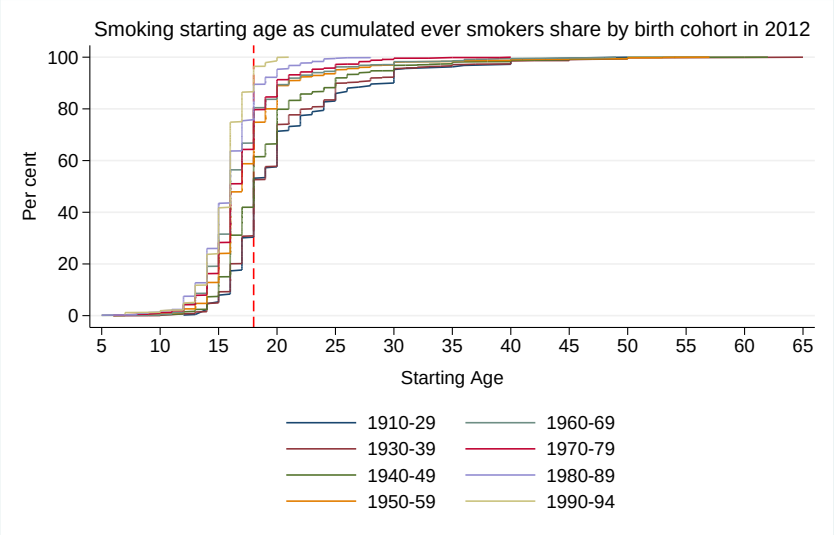
Figure 31 Panel (b) depicts the average starting age for three education groups by birth cohorts in 2012. It is noticeable that a higher educational level delayed smoking initiation.

Figure 32 depicts for eight birth cohorts the cumulated percentage of ever smokers who started smoking before a specific age. As a reference line, the red dashed vertical line marks age 18. For example, about 83% of ever smokers born between 1930 and 1939, started smoking before 25.

We again observe the decline in average starting age. About 30% of ever smokers born between 1910 and 1939 started smoking before 18. Already about 42% of ever smokers born between 1940 and 1949 stared smoking before 18. For the 1980–1989 cohort, the share was 76%.

[60] The results for the 1990–1994 birth cohort need to be interpreted with caution. Persons in this cohort are only aged between 18 to 22, which implies that the sample size is relatively small compared to the other birth cohorts and also that persons in this cohort might still start smoking later in their life. Hence, the findings concerning the average starting age might be biased downwards.

Figure 32: Smoking starting age as cumulated ever smokers share by birth cohort in 2012



Note: SOEP wave 2012. Data weighted by expansion factors supplied in the data set. Ever smoker is defined as a person who has smoked at least one hundred cigarettes or other tobacco products during the course of his life. The red dashed vertical line marks the age of 18.

6.3 Smoking Cessation

This section analyses characteristics of quitters. We define quitters as smokers who quit smoking and did not start again during the period of observation.

Identifying quitters is only possible because of the unique panel structure of the SOEP. The data set was adjusted and a balanced panel was constructed to reveal full individual-specific smoking histories. [61] The balanced panel is necessary to secure that only those smokers are categorised as quitters who did not relapsed in the period of observation. Characteristics of quitters are always reported for the year 2014.[62]

There are two possible reference groups for successful quitters: ever smokers or current smokers. In the first part of our analysis, we take current smokers as the reference group. In the second part of our analysis, we take ever smokers as the reference group. Using ever smokers, we gain information about quitters who quit before the period of observation. The most recent SOEP wave that contains the share of ever smokers is from 2012.

Table 15: Summary statistics for quitters in 2014

	Quitters	**Non-quitters**	**All**
		Mean	
Age (Years)	55.61	49.24	50.57
	(15.33)	(16.84)	(16.73)
Education in Years	12.05	11.72	11.79
	(2.63)	(2.80)	(2.77)
Equivalent Income (€)	23,732.88	22,944.11	23,108.61
	(12,022.50)	(14,717.65)	(14,199.93)
No. of Kids in HH	0.21	0.20	0.20
	(0.53)	(0.54)	(0.54)

Note: SOEP waves 2002–2014. Balanced Panel with adjustments for younger birth cohorts (see Chapter 3). Standard deviations are displayed in brackets. Quitters are defined as smokers who quit smoking during the period of observation and did not replapse.

6.3.1 Quitters among Current Smokers

Table 15 displays averages of selected variables for quitters and non-quitters. Quitters were on average older, were better educated and had a higher income than non-quitters.

To assess whether smokers with a low smoking intensity were more likely to quit smoking, we consider the consumption group a smoker belonged to before quitting to smoke (see Table C12 and Table C12 in the Appendix). Smokers with a low smoking intensity were on average more likely to quit smoking. For example, in 2004, among smokers who had a consumption between 1 and 5 CPD in 2002, the share of quitters was 16% and thus the highest compared with other consumption groups. In general, among smokers with a high consumption, the share of quitters tended to be lower. Results indicate that smokers with a lower consumption were more likely to quit smoking.

Table 16 depicts the share of quitters among several socio-economic groups. About 21% of female and male smokers successfully quit smoking between 2002 and 2014. The share of quitters was higher among those who were older than 65, had a high income, were self-employed or were widowed. Smokers with tertiary education had the highest share of quitters (24%). Surprisingly, the share of quitters among smokers with a basic educational level was not much lower, although among them smoking prevalence did not decrease between 1998 and 2014.[63] There are two possible explanations. First, there were more people with basic educational level

[61] To maintain a large sample size, the analysis was restricted to the years 2002 to 2014. Furthermore, to include young persons in the analysis, the panel is not balanced for persons born after 1986.

[62] If, for example, a male quitter was married in 2006 but is a single in 2014, he will be reported as being 'single', although he maybe was married at the point of time he actually quit smoking. Thus, there may be some bias when characteristics of quitters are assessed.

[63] See Table B3 in the Appendix.

Table 16: Share of quitters among socio-economic groups in 2014

	Non-Quitter	Quitter	Total
	In Per Cent		
Gender			
Women	79.48	20.52	100.00
Men	78.85	21.15	100.00
Total	79.15	20.85	100.00
Age Group			
18–30	91.31	8.69	100.00
31–45	80.58	19.42	100.00
46–65	78.76	21.24	100.00
>65	68.99	31.01	100.00
Total	79.15	20.85	100.00
Educational Level			
Dropouts	86.78	13.22	100.00
Basic Secondary School	77.96	22.04	100.00
Intermediate Secondary School	78.31	21.69	100.00
Maturity Certificate	84.11	15.89	100.00
Tertiary Education	75.95	24.05	100.00
Total	78.53	21.47	100.00
Equivalent Income			
1st (Lowest) Quartile	83.37	16.63	100.00
2nd Quartile	80.10	19.90	100.00
3rd Quartile	76.61	23.39	100.00
4th (Highest) Quartile	76.66	23.34	100.00
Total	79.15	20.85	100.00
Region			
West	78.72	21.28	100.00
East (with Berlin)	80.74	19.26	100.00
Total	79.15	20.85	100.00
Occupational Position			
Worker	82.49	17.51	100.00
Self-employed	77.87	22.13	100.00
Employee	80.97	19.03	100.00
Civil Servant	81.43	18.57	100.00
Unemployed	85.85	14.15	100.00
Total	81.66	18.34	100.00
Marital Status			
Single	85.79	14.21	100.00
Married	75.30	24.70	100.00
Widowed	73.99	26.01	100.00
Divorced	78.17	21.83	100.00
Total	79.00	21.00	100.00

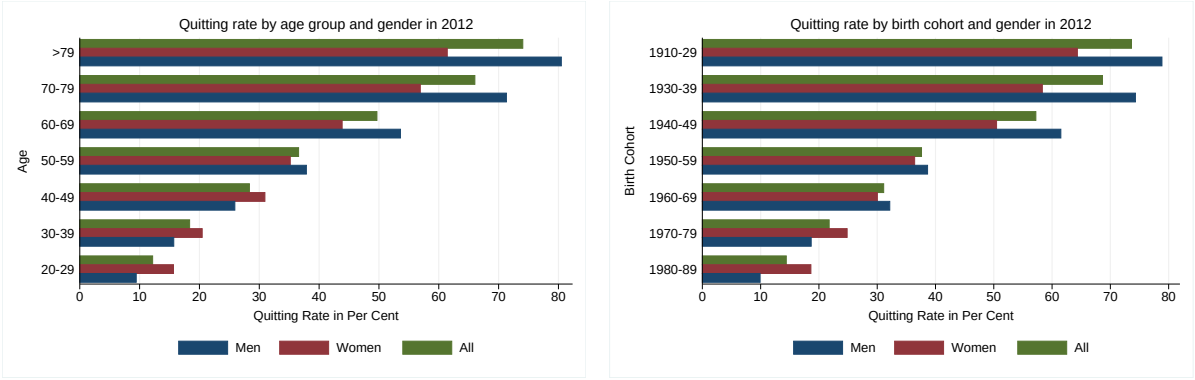
Note: SOEP waves 2002–2014. Balanced Panel with adjustments for younger birth cohorts (see Chapter 3). Standard deviations are displayed in brackets. Quitters are defined as smokers who quit smoking during the period of observation and did not replapse. Basic Secondary School = Hauptschulabschluss; Intermediate Secondary School = Realschulabschluss; Maturity Certificate = Abitur; Tertiary Education = Uni-/ Fachhochschulabschluss.

starting to smoke than stopping to smoke. Indeed, the share of ever smokers was quite high among persons with basic educational level (see Figure 30). Second, the structure of the data differs to the one used in the previous analysis. Whereas for the analysis of the development of smoking prevalence an unbalanced panel is used; for the analysis of quitters a balanced panel is used.[64] Dropouts had the lowest share of successful quitters, which fits to the relative high smoking prevalence among this educational group. Unemployed persons had the lowest share of successful quitters. Among unemployed smokers, smoking prevalence really increased.

6.3.2 Quitters among Ever Smokers

In the following section, not only those who quit during the period of observation, but all quitters are included in the analysis. Because a person may have quit long before the period of observation and because socio-economic factors may change over time, we concentrate on stable characteristics. The birth cohort is constant over times. The educational level is also often constant, at least for older respondents. The only time-variable characteristics focused on is age.

Figure 33: Share of quitters by gender, age group and birth cohort in 2012



(a) Age Group (b) Birth Cohort

Note: SOEP waves 2002–2014. Balanced Panel with adjustments for younger birth cohorts (see Chapter 3). Quitters are defined as smokers who quit smoking during the period of observation and did not replapse.

Figure 33 Panel (a) displays for men and women the share of quitters among ever smokers by age groups. Panel (b) displays the share of quitters by birth cohorts. Quitting rates of male and female ever smokers increased with age. Thus, the percentage of quitters was higher among older birth cohorts. However, whereas among young women, quitting rates were higher than those of men, among older women, they were lower. Precisely, about 80% of all male ever

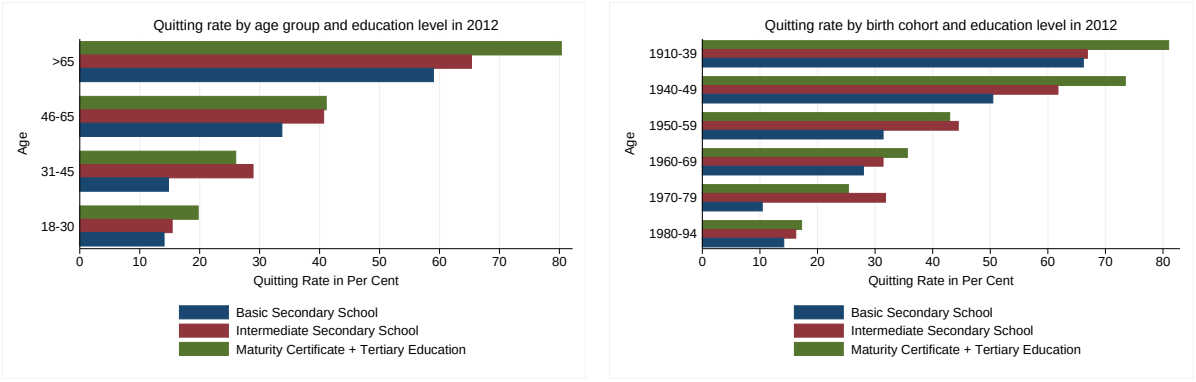
[64]The purpose of a balanced panel is to observe a smoker over a certain period of time and assess whether he or she changed the smoking behaviour.

smokers aged older than 79 had quit smoking, but only 61% of female ever smokers aged older than 79 had quit. The lower quitting rates of women are an important factor explaining the assimilation of smoking prevalence between men and women in older age groups (see Figure 5).

In fact, smoking prevalence among women was rather low for older birth cohorts (see Figure 7). Our findings are in line with those of Schulze and Lampert (2006), who also observe low quitting rates among older women. It seems that if women of those birth cohorts started to smoke at all, they still tended to do so in 2012.

On the other hand, higher quitting rates of young women explain the gap between smoking prevalences among young women and men. Already about 17% of female ever smokers aged between 20 and 29 had quit smoking, but only about 11% of male ever smokers had quit.

Figure 34: Share of quitters by educational level, age group and birth cohort in 2012



(a) Age Group (b) Birth Cohort

Note: SOEP waves 2002–2014. Balanced Panel with adjustments for younger birth cohorts (see Chapter 3). Quitters are defined as smokers who quit smoking during the period of observation and did not replapse. Due to sample size persons with a maturity certificate and persons with a tertiary education are combined and school dropouts excluded.

As seen in Table 16, quitting rates differed between educational levels. In Section 4.2, we have observed that smoking behaviour among educational levels was dependent on the age (or birth cohort) of a person. Therefore, Figure 34 Panel (a) depicts quitting rates for three educational levels by age group. Panel (b) depicts quitting rates for three educational levels by birth cohort.[65] Ever smokers with the lowest educational level had the lowest quitting rates across all age groups and all birth cohorts.

Among younger ever smokers, the quitting rate did not differ much between educational levels. Among older ever smokers, quitting rates were higher among more highly educated smokers. Among ever smokers aged older than 65, about 80% of those with a maturity certificate

[65] Remember that Table 16 displays the quitting rates of those smokers who still smoked at least once in the period of observation, whereas the results of Figure 34 refer to the quitting rates of ever smokers, whether or not they smoked in the period of observation.

or tertiary education had quit smoking, but only about 60% of those with basic educational level had quit.

7 Health and Smoking

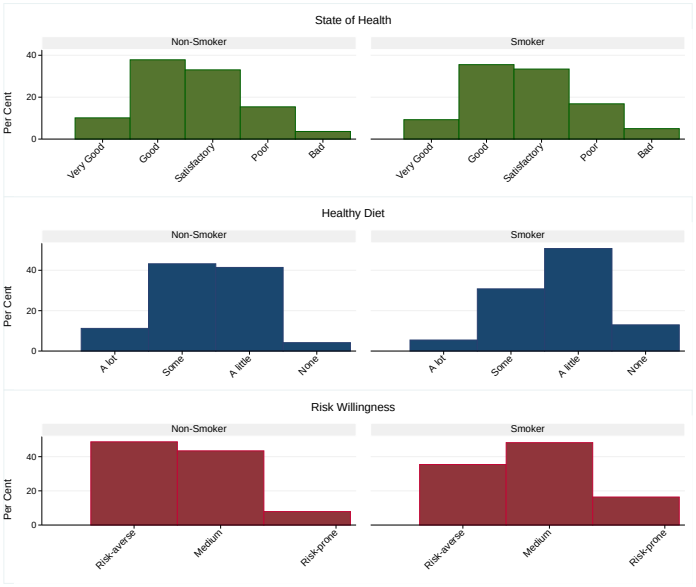
Since 2002, the number of health-related questions in SOEP questionnaire has been growing, which offers the opportunity to assess smoking behaviour in relation with attitudes towards health. The hypothesis is that smokers have a different attitude towards health than non-smokers, and that heavy smokers have a different one than non-heavy smokers. Three health-related variables were considered. First, the variable *state of health* measures the persons own assessment of its current state of health and is scaled from 1 to 5, where 1 stands for 'very good' and 5 for 'bad'. Second, the variable *healthy diet* measures how much attention a person pays to maintaining a healthy diet on a scale from 1 to 4, where 1 stands for 'a lot' and 4 for 'none'. Third, the variable *risk willingness* measures the willingness to take risks with regard to health. Respondents are asked to answer on a scale from 0 to 10, where 0 means risk-averse and 10 means risk-prone. We pooled the answers to three categories: 'risk-averse' (0–2), 'medium' (3–6), 'risk-prone' (7–10).[66]

Figure 35 depicts the health variables for smokers and non-smokers in 2014. In 2014, there were slightly more smokers who assessed their own health as poor or bad than non-smokers. Smokers paid less attention to a healthy diet and were more willing to take a risk with regard to health. 13% of smokers paid no attention to a healthy diet, whereas only 4% of non-smokers paid no attention (see also Table E1 in the Appendix). 16% of smokers were risk-prone, whereas only 8% of non-smokers were.

Additionally, we want to check whether among smokers themselves attitudes towards health were connected to smoking intensity. Table 17 displays for the three health variables and their respective categories the distribution into five consumption groups. Smokers who declared their health as very good, answered that they pay attention to a healthy diet and were risk-averse (not willing to take risk) with regard to health, tended to have a low consumption, that is, they had the highest share of light smokers (1–5 CPD). In contrast, smokers who declared their state of health as bad, paid no attention to a healthy diet and were risk-prone had the highest share of heavy smokers. The remarkable observation is that there were actually some heavy smokers who seemed to care a lot about their health. They declared that their health was very good, that they cared about a healthy diet and that they were risk-averse with regard to health.

[66]The category 'risk-prone' contains more values than the category 'risk-averse' to create a more equal distribution into categories.

Figure 35: Comparison of smokers and non-smokers by health indicators in 2014



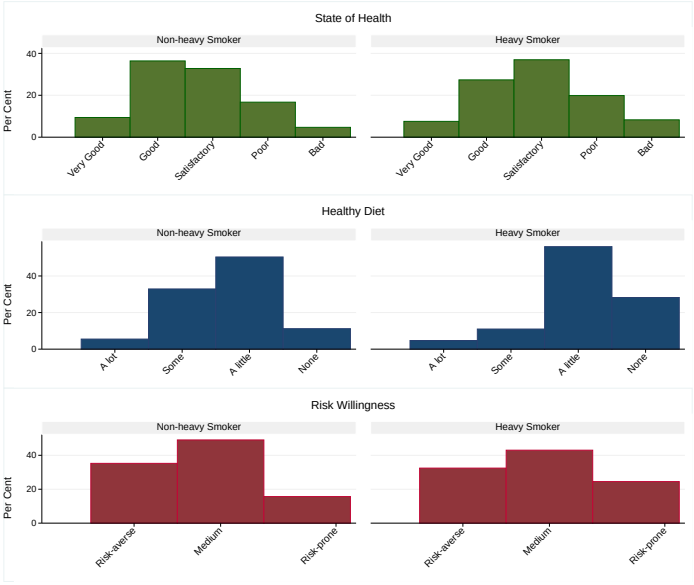
Note: SOEP wave 2014. Data weighted by expansion factors supplied in the data set. State of health measures the respondents own assessment of its current state of health. Healthy diet measures how much attention a person pays to maintaining a healthy diet. Risk willingness measures the willingness to take risks with regard to health.

Table 17: Comparison of consumption groups (in CPD) by health indicators in 2014

	Smoking Intensity (CPD) in 2014					
	1–5	**6–10**	**11–15**	**16–20**	**>20**	**Total**
	In Per Cent					
State of Health						
Very Good	21.97	23.10	19.31	26.26	9.37	100.00
Good	18.08	27.04	21.49	24.57	8.81	100.00
Satisfactory	14.28	25.21	21.46	26.39	12.67	100.00
Poor	12.38	27.91	19.12	27.36	13.23	100.00
Bad	8.26	27.57	22.17	23.50	18.50	100.00
Healthy Diet						
A lot	21.57	36.51	14.60	17.19	10.13	100.00
Some	22.97	30.01	23.01	19.80	4.21	100.00
A little	12.24	23.22	22.63	29.16	12.75	100.00
None	7.24	20.49	17.90	29.50	24.87	100.00
Risk Willingness						
Risk-averse	16.66	27.11	22.05	23.60	10.58	100.00
Medium	16.06	26.61	21.12	26.08	10.12	100.00
Risk-prone	13.41	22.56	18.35	28.97	16.71	100.00
All	15.76	26.22	20.92	25.71	11.39	100.00

Note: SOEP wave 2014. Data weighted by expansion factors supplied in the data set. State of health measures the respondents own assessment of its current state of health. Healthy diet measures how much attention a person pays to maintaining a healthy diet. Risk willingness measures the willingness to take risks with regard to health. CPD = Cigarettes per day.

Figure 36: Comparison of heavy smokers and non-heavy smokers by health indicators in 2014



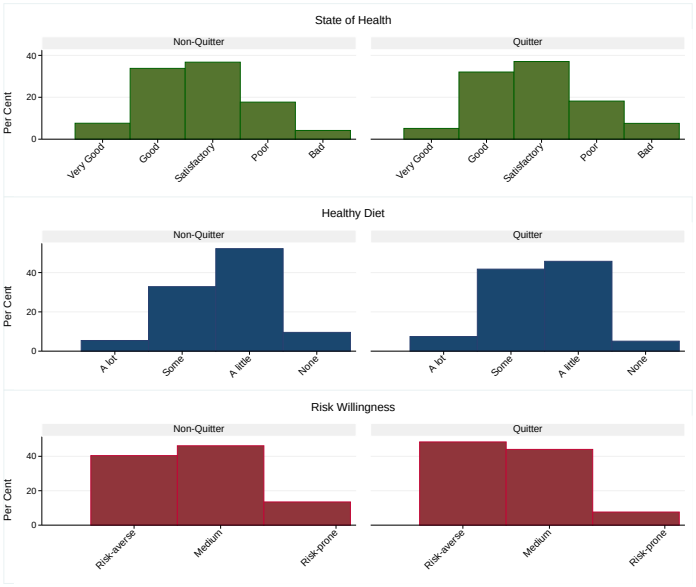
Note: SOEP wave 2014. Data weighted by expansion factors supplied in the data set. State of health measures the respondents own assessment of its current state of health. Healthy diet measures how much attention a person pays to maintaining a healthy diet. Risk willingness measures the willingness to take risks with regard to health. Heavy smokers are defined as smokers with a daily cigarette consumption higher than 20 cigarettes.

In summary, attitudes towards health differed across consumption groups. This is even more evident if we compare the health-related statements of only non-heavy and heavy smokers. Figure 36 depicts the health variables for heavy smokers and non-heavy smokers in 2014. Heavy smokers described their state of health more often as poor and bad compared to non-heavy smokers and they also paid less attention to a healthy diet. Their statements about risk willingness with regard to health are however surprising. Although heavy smokers smoked more than 20 CPD and therefore were willing to risk smoking-related illness, about one third stated that they were risk-averse with regard to health. Among female heavy smokers, even 40% responded that they were risk-averse.[67]

To conclude the section on health, we compare quitters and non-quitters according to their attitudes towards health. Figure 37 depicts the health variables for quitters and non-quitters in 2014. Quitters were on average less satisfied with their state of health or, in other words, more critical regarding their own state of health (see also Table E4 in the Appendix). Quitters also paid more attention to a healthy diet and were more risk-averse than non-quitters.

[67] Detailed results with regard to risk willingness among female and male heavy smokers and other consumption groups can be found in the Appendix in Table E3.

Figure 37: Comparison of quitters and non-quitters by health indicators in 2014



Note: SOEP waves 2002–2014. Balanced Panel with adjustments for younger birth cohorts (see Chapter 3). Quitters are defined as smokers who quit smoking during the period of observation and did not replapse. State of health measures the persons own assessment of its current state of health. Healthy diet measures how much attention a person pays to maintaining a healthy diet. Risk willingness measures the willingness to take risks with regard to health.

8 Conclusion

Smoking behaviour in Germany changed considerably between 1998 and 2014. Smoking prevalence and smoking intensity both declined substantially, but not in all socio-economic groups. For example, less educated people older than 45 had a higher smoking prevalence in 2014 than in 1998. Furthermore, smoking prevalence among unemployed people increased. In 2014, 56% of unemployed people smoked; in comparison, only about 27% of the overall German population smoked. Among men, smoking prevalence declined substantially, so that it is surprising that among women, smoking prevalence did not change much. Smoking intensity increased among 66-to-75-year-olds, although it decreased in all other age groups. Furthermore, the share of school dropouts, people with a low income and unemployed people increased among those smokers with a high smoking intensity (heavy smokers). Between 1998 and 2014, both smoking prevalence and smoking intensity decreased most among younger people (under 45), better educated people and people with a high income.

Apart from smoking prevalence and intensity, other measures of smoking behaviour show a similar development. The share of ever smokers (as a measure of smoking initiation) among better educated people was significantly lower in younger cohorts than in older cohorts. Moreover,

quitters (as a measure of smoking cessation) were on average better educated and had a higher income than non-quitters. In 2014, smoking was still widespread among certain socio-economic groups and substantially higher than in other ones. Thus, SOEP data supports a social gradient in smoking. People who were less advantaged in terms of socio-economic position had a higher probability of smoking. In particular, among adults who were aged between 18 to 65, not only smoking prevalence, but also smoking intensity were higher among those with a lower educational level. Moreover, the lower the net equivalent household income was, the higher were the smoking prevalence and smoking intensity. Indeed, smoking prevalence was highest among poorly educated people living in low-income households. Heavy smokers were on average older, less educated and had a lower income than smokers in general. Considering birth cohorts, disparities in smoking in relation to educational level differed between generations. First, whereas across all cohorts, smoking prevalence among more highly educated people was on average lower than among less educated people, the significant difference in levels was a characteristic of younger cohorts. In addition, whereas among older cohorts, the share of ever smokers was highest among highly educated people and those with a high income, among younger cohorts, it was highest among those with lower educational level and lower income. Thus, the educational gradient in smoking initiation reversed over generations.

In conclusion, using SOEP data from 1998 through 2014, we find that socio-economic factors were related to smoking prevalence and smoking intensity, including their development over time. In the case of gender, smoking prevalence converged over time, whereas for educational level, they diverged. Furthermore, the development of smoking behaviour in Germany indicates some success of tobacco control measures, yet only for certain subgroups of the population. In consequence, new measures to reduce smoking seem advisable and evaluating of the effectiveness of existing policy interventions as important as ever.

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Appendix

A Data Set

Table A1: Overview of German tobacco control measures

	Tobacco Control Policy	**Cigarette Excise Tax**
1975	Advertising ban: radio and TV	
1992		Increase (ca. 0.3 cent/stick)
1999	Advertising ban: sponsoring of radio and TV shows	
2002	1. Advertising ban: no commercials in cinemas before 6pm 2. Smoking ban: work place	Increase (ca. 1 cent/stick)
2003	1. Youth protection: no sales under 16 2. Product design: warning labels, prohibition to use the label 'light'	Increase (ca. 1 cent/stick)
2004	1. Youth protection: prohibited to give away free cigarettes	Increase (ca. 2 cent/stick)
2005		Increase (ca. 0.5 cent/stick)
2007	1. Youth protection: smoking prohibited under 18 2. Smoking ban: public buildings, public transport, hospitality venues 3. Advertising ban: internet, magazines, sport events	
2008	Smoking ban: hospitality venues	
2009	Youth protection: ID check cigarette machine	
2011		Increase (ca. 0.4 cent/stick)
2012		Increase (ca. 0.4 cent/stick)
2013		Increase (ca. 0.4 cent/stick)
2014		Increase (ca. 0.4 cent/stick)
2015		Increase (ca. 0.4 cent/stick)

Note: Cigarette excise tax increase per stick is calculated based on average real tax rates from Destatis. Information about advertising bans are from Deutsches Krebsforschungszentrum (2012).

B Smoking Prevalence

Table B2: Smoking prevalence and change in smoking prevalence by gender and age group

	Year			Change	
	1998	**2006**	**2014**	**Δ1998–14**	**Δ2006–14**
	In Per Cent				
All	30.17	30.03	26.65	−11.68	−11.26
				(0.00)	(0.00)
Women	23.81	26.70	23.54	−1.11	−11.82
				(0.65)	(0.00)
Men	37.16	33.64	29.96	−19.37	−10.93
				(0.00)	(0.00)
18–20	34.85	37.53	22.72	−34.81	−39.46
				(0.00)	(0.00)
21–25	41.68	44.54	31.25	−25.03	−29.85
				(0.00)	(0.00)
26–30	44.25	37.40	31.50	−28.81	−15.76
				(0.00)	(0.00)
31–35	41.76	37.64	33.38	−20.08	−11.32
				(0.00)	(0.01)
36–40	40.91	35.69	32.19	−21.31	−9.82
				(0.00)	(0.01)
41–45	42.40	40.37	31.26	−26.26	−22.57
				(0.00)	(0.00)
46–50	33.07	38.93	34.08	3.05	−12.45
				(0.48)	(0.00)
51–55	31.06	35.41	33.53	7.96	−5.33
				(0.13)	(0.19)
56–60	23.61	27.83	33.27	40.91	19.55
				(0.00)	(0.00)
61–65	17.82	19.46	26.29	47.51	35.08
				(0.00)	(0.00)
66–70	17.08	13.82	19.65	15.09	42.21
				(0.12)	(0.00)
71–75	8.21	10.95	10.90	32.75	−0.41
				(0.04)	(0.97)
>75	4.99	8.42	7.30	46.35	−13.37
				(0.02)	(0.22)

Note: SOEP waves 1998, 2006 and 2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. P-values in parentheses.

Table B3: Smoking prevalence and change in smoking prevalence by birth cohort, educational level and income quartile

	Year			Change	
	1998	**2006**	**2014**	**Δ1998–14**	**Δ2006–14**
	In Per Cent				
1910–1929	7.79	7.70	4.26	−45.31	−44.65
				(0.05)	(0.02)
1930–1939	19.33	12.90	7.85	−59.40	−39.18
				(0.00)	(0.00)
1940–1949	29.17	21.25	16.53	−43.33	−22.20
				(0.00)	(0.00)
1950–1959	38.24	36.30	31.51	−17.62	−13.19
				(0.00)	(0.00)
1960–1969	42.92	38.54	33.63	−21.65	−12.74
				(0.00)	(0.00)
1970–1979	41.36	37.69	31.44	−23.99	−16.60
				(0.00)	(0.00)
1980–1989	34.52	41.24	32.78	−5.05	−20.52
				(0.50)	(0.00)
1990–1996			27.54		
Dropouts	36.38	45.93	48.08	32.18	4.68
				(0.00)	(0.52)
Basic Secondary	29.56	30.00	29.75	0.62	−0.85
				(0.81)	(0.72)
Intermediate	34.58	34.52	30.75	−11.09	−10.93
				(0.00)	(0.00)
Maturity Certificate	31.78	27.02	23.72	−25.35	−12.20
				(0.00)	(0.01)
Tertiary Education	23.19	20.95	16.38	−29.40	−21.85
				(0.00)	(0.00)
1st (Lowest) Inc. Quartile	33.56	36.13	33.86	0.89	−6.29
				(0.74)	(0.01)
2nd Inc. Quartile	29.40	28.59	26.83	−8.73	−6.15
				(0.00)	(0.03)
3rd Inc. Quartile	29.33	28.22	25.57	−12.83	−9.41
				(0.00)	(0.00)
4th (Highest) Inc. Quartile	28.39	27.17	20.33	−28.40	−25.18
				(0.00)	(0.00)

Note: SOEP waves 1998, 2006 and 2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. Basic Secondary = Hauptschulabschluss; Intermediate = Realschulabschluss; Maturity Cert. = Abitur; Tertiary Educ. = Uni-/ Fachhochschulabschluss. P-values in parentheses.

Table B4: Smoking pevalence and change in smoking prevalence by region

	Year			Change	
	1998	**2006**	**2014**	**Δ1998–14**	**Δ2006–14**
	In Per Cent				
East (with Berlin)	29.55	29.47	29.41	−0.49	−0.19
				(0.87)	(0.95)
West	30.34	30.18	25.94	−14.50	−14.04
				(0.00)	(0.00)
Schleswig-Holstein	24.96	33.25	27.05	8.36	−18.65
				(0.40)	(0.01)
Hamburg	35.81	32.28	27.49	−23.23	−14.83
				(0.03)	(0.15)
Lower Saxony	28.29	28.62	25.93	−8.33	−9.37
				(0.10)	(0.04)
Bremen	39.31	34.05	25.43	−35.33	−25.32
				(0.01)	(0.07)
North-Rhine-Westfalia	30.95	32.04	28.41	−8.19	−11.34
				(0.01)	(0.00)
Hessen	30.89	31.83	26.80	−13.24	−15.78
				(0.02)	(0.00)
Rhineland-Palatinate	30.12	31.81	25.05	−16.83	−21.24
				(0.01)	(0.00)
Baden-Wuerttemberg	31.79	28.14	21.82	−31.36	−22.45
				(0.00)	(0.00)
Bavaria	29.38	27.87	24.87	−15.36	−10.75
				(0.00)	(0.00)
Saarland		28.37	32.29		13.83
					(0.34)
Berlin	37.11	37.96	30.79	−17.04	−18.89
				(0.01)	(0.00)
Brandenburg	33.98	29.09	32.91	−3.15	13.16
				(0.65)	(0.07)
Mecklenburg-Vorpommern	27.04	31.79	31.22	15.47	−1.80
				(0.15)	(0.84)
Saxony	21.65	24.38	24.37	12.54	−0.04
				(0.09)	(0.99)
Saxony-Anhalt	30.64	29.40	33.62	9.72	14.35
				(0.20)	(0.05)
Thuringia	30.99	26.13	28.32	−8.62	8.35
				(0.23)	(0.28)

Note: SOEP waves 1998, 2006 and 2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. P-values in parentheses. No data available for Saarland in 1998. West Germany contains the federal states Schleswig-Holstein, Hamburg, Lower Saxony, Bremen, North-Rhine-Westfalia, Hessen, Rhineland-Palatinate, Baden-Wuerttemberg, Bavaria and Saarland. East Germany contains the federal states Berlin, Brandenburg, Mecklenburg-Vorpommern, Saxony, Saxony-Anhalt and Thuringia.

Table B5: Smoking pevalence and change in smoking prevalence by occupational position and martial status

	Year			Change	
	1998	**2006**	**2014**	**Δ1998–14**	**Δ2006–14**
	In Per Cent				
Worker	47.96	43.88	40.69	−15.17	−7.28
				(0.00)	(0.01)
Self-employed	34.81	33.95	25.70	−26.16	−24.31
				(0.00)	(0.00)
Employee	32.02	32.29	28.22	−11.87	−12.63
				(0.00)	(0.00)
Civil Servant	29.51	26.42	22.24	−24.63	−15.82
				(0.00)	(0.03)
Unemployed	47.58	52.62	56.18	18.08	6.77
				(0.00)	(0.05)
Married	39.05	39.79	32.11	−17.77	−19.30
				(0.00)	(0.00)
Single	28.46	25.18	22.51	−20.91	−10.60
				(0.00)	(0.00)
Widowed	11.98	14.60	14.11	17.74	−3.41
				(0.13)	(0.70)
Divorced	43.74	46.73	40.44	−7.56	−13.48
				(0.06)	(0.00)

Note: SOEP waves 1998, 2006 and 2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. P-values in parentheses.

Table B6: Smoking prevalence by year and socio-economic factors (all)

	Year										
	1998	**1999**	**2001**	**2002**	**2004**	**2006**	**2008**	**2010**	**2012**	**2014**	**Total**
	Smoking Prevalence in Per Cent										
Gender											
Women	23.81	25.25	25.23	25.25	25.26	26.70	24.81	24.22	24.05	23.54	24.81
Men	37.16	37.72	35.68	35.84	34.80	33.64	32.20	31.13	30.71	29.96	33.85
Age Group											
18–20	34.85	42.22	37.45	38.71	32.79	37.53	27.15	24.97	23.67	22.72	32.40
21–25	41.68	43.73	40.71	42.49	44.15	44.54	39.57	36.30	33.19	31.25	39.72
26–30	44.25	45.49	39.06	38.26	39.55	37.40	37.23	37.24	36.27	31.50	38.69
31–35	41.76	42.98	39.15	39.26	36.86	37.64	35.70	32.88	34.67	33.38	37.82
36–40	40.91	41.48	42.89	41.40	39.19	35.69	33.15	30.27	32.08	32.19	37.48
41–45	42.40	43.76	40.97	39.11	40.00	40.37	36.81	36.21	33.56	31.26	38.50
46–50	33.07	35.31	39.72	42.97	40.15	38.93	34.61	35.99	34.82	34.08	36.88
51–55	31.06	31.09	32.17	32.44	32.93	35.41	38.45	35.11	34.52	33.53	33.80
56–60	23.61	22.62	25.31	25.49	28.20	27.83	27.56	30.53	30.22	33.27	27.45
61–65	17.82	19.62	18.88	19.85	19.30	19.46	21.08	22.41	24.29	26.29	20.79
66–70	17.08	16.95	12.73	13.03	13.74	13.82	15.97	14.81	17.75	19.65	15.46
71–75	8.21	8.70	12.64	11.92	12.40	10.95	11.35	12.00	12.06	10.90	11.19
>75	4.99	6.07	5.87	6.36	7.05	8.42	6.98	6.61	6.73	7.30	6.68
Birth Cohort											
1910–29	7.79	8.10	7.96	7.97	7.44	7.70	6.17	5.72	5.56	4.26	7.43
1930–39	19.33	19.08	15.97	15.15	13.77	12.90	11.75	10.47	9.01	7.85	14.00
1940–49	29.17	28.07	27.34	26.08	24.67	21.25	20.47	18.22	17.70	16.53	23.06
1950–59	38.24	39.43	39.35	39.59	37.43	36.30	34.99	32.94	31.45	31.51	36.18
1960–69	42.92	43.06	41.31	40.26	39.74	38.54	35.61	36.10	34.99	33.63	38.62
1970–79	41.36	45.01	39.47	40.01	38.54	37.69	34.29	31.54	32.44	31.44	37.01
1980–89	34.52	40.48	38.70	40.86	39.99	41.24	38.26	36.77	35.22	32.78	37.48
1990–96							19.05	24.97	27.08	27.54	26.22
Educational Level											
Dropouts	36.38	38.45	38.32	41.79	41.84	45.93	47.14	52.29	47.19	48.08	43.30
Basic Secondary	29.56	30.32	29.95	30.47	29.22	30.00	30.41	29.05	29.38	29.75	29.83
Intermediate	34.58	35.53	34.36	34.02	34.04	34.52	31.68	31.78	31.71	30.75	33.24
Maturity Cert.	31.78	32.70	29.03	28.96	28.96	27.02	24.15	23.43	23.73	23.72	27.00
Tertiary Educ.	23.19	24.38	23.34	22.42	22.28	20.95	18.54	18.07	17.54	16.38	20.30
Equivalent Income											
1st (Lowest) Quartile	33.56	33.55	30.81	32.40	33.02	36.13	33.25	33.36	33.71	33.86	33.37
2nd Quartile	29.40	31.49	32.16	30.69	29.62	28.59	28.59	27.04	26.85	26.83	29.11
3rd Quartile	29.33	30.31	30.56	30.31	28.55	28.22	28.28	26.82	26.42	25.57	28.43
4th (Highest) Quartile	28.39	29.48	27.54	27.98	28.17	27.17	23.38	22.97	22.12	20.33	25.73
All	30.17	31.21	30.27	30.34	29.84	30.03	28.38	27.55	27.28	26.65	29.16

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. Basic Secondary = Hauptschulabschluss; Intermediate = Realschulabschluss; Maturity Cert.= Abitur; Tertiary Educ. = Uni-/ Fachhochschulabschluss.

Table B7: Smoking prevalence by year and socio-economic factors (all): continued

	Year										
	1998	**1999**	**2001**	**2002**	**2004**	**2006**	**2008**	**2010**	**2012**	**2014**	**Total**
	Smoking Prevalence in Per Cent										
Occupation											
Worker	47.96	47.78	46.48	45.57	43.53	43.88	43.05	42.28	40.33	40.69	44.28
Self-employed	34.81	34.80	35.81	32.83	36.39	33.95	29.58	28.79	26.59	25.70	31.86
Employee	32.02	33.95	32.89	32.61	32.60	32.29	30.05	29.10	29.77	28.22	31.19
Civil Servant	29.51	34.17	29.26	28.83	25.83	26.42	22.64	24.98	24.37	22.24	26.80
Unemployed	47.58	44.97	48.77	52.24	52.04	52.62	52.15	52.58	56.41	56.18	51.48
Marital Status											
Single	39.05	41.90	39.37	40.13	40.28	39.79	36.11	34.06	33.22	32.11	37.32
Married	28.46	28.57	27.30	26.93	25.31	25.18	23.76	23.50	23.60	22.51	25.59
Widowed	11.98	12.50	14.32	14.32	15.22	14.60	14.55	13.60	14.81	14.11	13.94
Divorced	43.74	44.06	45.02	44.76	45.81	46.73	44.93	42.94	40.44	40.44	43.80
Region											
West	30.34	31.51	30.51	30.32	29.79	30.18	28.27	27.48	26.82	25.94	29.10
East	29.55	30.10	29.37	30.44	30.03	29.47	28.76	27.81	29.04	29.41	29.40
Place of Residence											
Schleswig-Holstein	24.96	31.15	31.49	32.54	31.94	33.25	28.87	24.68	25.48	27.05	29.25
Hamburg	35.81	40.69	37.29	34.69	38.57	32.28	32.58	33.02	28.62	27.49	33.76
Lower Saxony	28.29	29.28	30.31	31.38	29.57	28.62	28.11	27.67	28.57	25.93	28.76
Bremen	39.31	41.09	36.09	33.32	35.13	34.05	26.96	27.56	27.62	25.43	32.44
North-Rhine-Westfalia	30.95	31.85	33.03	31.99	31.06	32.04	30.96	28.60	27.56	28.41	30.63
Hessen	30.89	31.04	30.02	29.96	29.15	31.83	29.44	26.68	25.87	26.80	29.19
Rhineland-Palatinate	30.12	31.90	32.17	31.42	31.94	31.81	25.11	25.54	26.59	25.05	29.28
Baden-Wuerttemberg	31.79	32.51	28.58	27.51	27.67	28.14	25.41	25.09	23.88	21.82	27.19
Bavaria	29.38	30.08	26.96	28.24	27.56	27.87	27.40	28.15	27.49	24.87	27.77
Saarland			29.59	29.05	29.63	28.37	21.42	32.09	28.65	32.29	28.85
Berlin	37.11	35.50	35.93	38.93	39.47	37.96	33.42	33.93	30.33	30.79	35.38
Brandenburg	33.98	32.32	27.64	28.84	28.81	29.09	31.19	27.30	30.79	32.91	30.30
Mecklenb. Pomerania	27.04	30.55	27.81	31.02	28.17	31.79	32.96	32.77	34.12	31.22	30.76
Saxony	21.65	22.91	25.23	25.39	25.73	24.38	25.25	22.48	25.34	24.37	24.26
Saxony-Anhalt	30.64	32.07	32.16	31.37	28.10	29.40	26.89	28.63	28.95	33.62	30.19
Thuringia	30.99	31.74	27.79	28.87	29.27	26.13	24.68	25.63	28.71	28.32	28.24
All	30.17	31.21	30.27	30.34	29.84	30.03	28.38	27.55	27.28	26.65	29.16

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. No data available for Saarland in 1998 and 1999. West Germany contains the federal states Schleswig-Holstein, Hamburg, Lower Saxony, Bremen, North-Rhine-Westfalia, Hessen, Rhineland-Palatinate, Baden-Wuerttemberg, Bavaria and Saarland. East Germany contains the federal states Berlin, Brandenburg, Mecklenburg-Western Pomerania, Saxony, Saxony-Anhalt and Thuringia.

Table B8: Smoking prevalence among women by year and socio-economic factors

	Year										
	1998	**1999**	**2001**	**2002**	**2004**	**2006**	**2008**	**2010**	**2012**	**2014**	**Total**
	Smoking Prevalence in Per Cent										
Age Group											
18–20	31.14	41.35	37.77	39.36	30.10	35.83	25.00	22.99	19.38	16.46	30.24
21–25	35.56	37.75	35.95	36.11	42.18	42.25	35.18	34.44	29.24	27.66	35.75
26–30	36.44	37.47	32.53	31.48	33.16	31.72	35.06	32.63	31.03	25.11	32.74
31–35	36.93	36.04	34.51	34.44	27.72	30.34	28.35	25.07	30.18	29.23	31.64
36–40	36.41	38.70	39.19	38.35	37.93	34.44	27.96	24.32	25.15	27.48	33.52
41–45	34.11	35.81	35.34	34.70	38.44	40.57	35.13	34.46	31.39	26.98	34.87
46–50	26.94	30.74	34.37	35.77	32.35	34.60	32.91	35.18	33.66	33.53	33.09
51–55	27.49	25.57	28.17	27.80	28.13	31.05	32.94	29.41	31.24	30.59	29.42
56–60	16.06	16.76	19.67	21.54	24.38	24.31	22.91	27.22	26.23	29.56	22.91
61–65	13.17	15.15	15.01	15.57	14.14	16.19	17.96	18.63	22.37	21.70	16.84
66–70	9.25	10.61	7.96	8.66	9.91	12.31	14.20	13.40	15.52	17.16	11.91
71–75	6.40	7.31	9.73	7.74	8.86	7.53	9.93	11.01	10.27	11.76	9.16
>75	4.87	5.74	4.91	5.21	6.21	6.74	4.87	4.61	4.87	6.04	5.43
Birth Cohort											
1910–29	6.16	6.75	6.36	6.14	6.47	6.55	4.63	4.75	4.10	2.82	6.02
1930–39	12.92	14.03	10.92	10.13	9.57	10.20	9.71	8.62	6.87	6.82	10.25
1940–49	22.67	21.37	22.77	22.15	19.73	18.26	17.43	15.73	15.90	15.09	19.15
1950–59	31.33	33.39	33.92	33.23	32.12	31.63	30.69	28.33	27.76	27.83	31.01
1960–69	38.55	38.43	37.72	37.35	37.54	38.43	34.13	34.82	33.46	31.80	36.21
1970–79	34.56	38.48	33.76	32.26	31.40	31.10	27.21	24.69	27.33	27.13	30.61
1980–89	32.75	38.61	36.55	40.06	37.76	38.72	35.15	33.49	30.47	27.93	34.23
1990–96							18.96	22.99	22.20	21.97	21.98
Educational Level											
Dropouts	27.76	25.79	22.30	27.66	26.27	31.37	35.62	39.04	35.01	37.77	30.45
Basic Secondary	21.13	22.87	23.33	24.17	23.31	25.61	24.97	24.31	25.21	26.65	24.00
Intermediate	28.29	29.48	28.89	28.59	29.46	30.96	28.30	28.75	27.68	26.88	28.72
Maturity Cert.	29.63	29.47	26.52	24.49	25.19	24.37	22.31	19.74	20.87	18.18	23.66
Tertiary Educ.	20.37	21.46	21.61	19.66	20.82	19.54	17.09	16.65	16.97	15.32	18.53
Equivalent Income											
1st (Lowest) Quartile	26.54	26.44	24.68	26.86	27.97	32.87	29.24	28.75	28.45	30.06	28.19
2nd Quartile	21.63	24.62	26.17	24.12	24.36	24.28	24.96	23.06	22.95	22.50	23.86
3rd Quartile	22.69	23.74	25.89	24.98	23.59	25.41	24.61	23.31	23.20	22.20	23.96
4th (Highest) Quartile	24.10	26.13	24.19	24.80	24.68	23.26	19.43	20.93	21.13	18.42	22.69
All	23.81	25.25	25.23	25.25	25.26	26.70	24.81	24.22	24.05	23.54	24.81

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. Basic Secondary = Hauptschulabschluss; Intermediate = Realschulabschluss; Maturity Cert.= Abitur; Tertiary Educ. = Uni-/ Fachhochschulabschluss. Sample reduced to Women.

Table B9: Smoking prevalence among women by year and socio-economic factors: continued

	Year										
	1998	**1999**	**2001**	**2002**	**2004**	**2006**	**2008**	**2010**	**2012**	**2014**	**Total**
	Smoking Prevalence in Per Cent										
Occupation											
Worker	38.94	37.38	38.84	38.26	34.47	39.62	36.32	35.95	32.34	36.70	36.86
Self-employed	32.61	31.54	31.39	29.03	31.05	28.10	25.99	28.84	23.18	19.60	27.65
Employee	31.78	33.59	32.78	31.67	32.44	33.04	30.48	29.44	29.46	27.04	30.98
Civil Servant	24.77	31.35	26.76	26.26	20.97	24.54	20.01	23.85	19.13	20.47	23.47
Unemployed	32.74	33.05	42.45	45.47	46.65	49.11	43.85	48.81	52.65	50.36	44.56
Marital Status											
Single	33.08	35.92	34.15	34.50	35.16	37.15	31.92	30.68	29.51	27.38	32.74
Married	22.52	23.21	23.28	22.97	21.72	22.36	20.94	20.45	20.91	20.17	21.88
Widowed	10.63	11.53	11.12	10.95	11.93	12.42	13.58	12.67	14.43	13.66	12.16
Divorced	37.55	38.35	39.77	39.68	41.58	43.18	40.77	39.33	35.90	37.11	39.32
Region											
West	24.37	25.92	25.88	25.70	25.34	27.00	24.68	24.04	23.87	22.92	24.97
East	21.75	22.76	22.84	23.54	24.98	25.57	25.32	24.94	24.73	25.99	24.23
Place of Residence											
Schleswig-Holstein	22.92	28.22	28.26	29.12	25.00	30.30	26.09	17.21	22.47	25.71	25.69
Hamburg	30.16	38.73	34.14	31.25	33.26	25.96	25.59	22.86	22.16	21.69	28.29
Lower Saxony	22.38	23.88	24.28	26.57	25.02	28.13	26.78	27.20	27.55	25.55	25.75
Bremen	29.86	37.55	31.91	30.91	35.53	37.13	26.90	25.50	34.26	28.19	31.78
North-Rhine-Westfalia	25.34	25.56	27.71	25.57	26.80	27.70	27.12	24.08	24.12	24.50	25.84
Hessen	23.29	24.19	24.00	26.31	24.44	26.43	23.50	22.87	23.39	22.88	24.14
Rhineland-Palatinate	20.72	23.94	26.01	27.01	27.07	28.87	22.43	25.83	25.55	22.56	24.82
Baden-Wuerttemberg	24.60	25.59	24.13	23.38	22.24	24.80	20.24	20.31	20.42	19.46	22.51
Bavaria	25.45	26.92	24.79	24.96	24.74	25.77	25.09	25.87	23.17	20.52	24.71
Saarland			23.83	22.77	22.44	23.66	17.36	30.85	30.39	32.65	25.08
Berlin	28.84	29.30	33.66	35.37	38.26	37.90	31.42	34.75	28.15	30.43	32.90
Brandenburg	25.68	23.92	21.16	20.85	22.47	23.73	25.67	24.94	25.02	26.60	24.01
Mecklenb. Pomerania	20.84	23.84	22.21	26.05	26.07	28.95	30.29	28.78	31.60	27.63	26.67
Saxony	13.48	15.26	17.29	16.56	18.38	17.97	20.49	15.45	19.04	19.34	17.27
Saxony-Anhalt	21.45	22.24	23.64	23.44	22.01	24.88	24.39	26.71	25.05	28.26	24.08
Thuringia	25.08	26.85	19.70	21.61	23.17	21.67	21.07	22.85	25.04	28.02	23.57
All	23.81	25.25	25.23	25.25	25.26	26.70	24.81	24.22	24.05	23.54	24.81

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. Sample reduced to Women. No data available for Saarland in 1998 and 1999. West Germany contains the federal states Schleswig-Holstein, Hamburg, Lower Saxony, Bremen, North-Rhine-Westfalia, Hessen, Rhineland-Palatinate, Baden-Wuerttemberg, Bavaria and Saarland. East Germany contains the federal states Berlin, Brandenburg, Mecklenburg-Western Pomerania, Saxony, Saxony-Anhalt and Thuringia.

Table B10: Smoking prevalence among men by year and socio-economic factors

	Year										
	1998	**1999**	**2001**	**2002**	**2004**	**2006**	**2008**	**2010**	**2012**	**2014**	**Total**
	Smoking Prevalence in Per Cent										
Age Group											
18–20	38.26	42.94	37.13	38.10	35.31	39.24	29.17	26.56	27.91	28.23	34.38
21–25	47.74	50.27	45.42	48.86	46.34	47.12	44.04	38.20	36.86	34.78	43.78
26–30	52.62	54.17	46.63	46.97	46.81	44.02	40.00	43.08	41.62	38.26	45.52
31–35	46.49	49.72	43.86	44.27	47.08	46.07	43.94	41.81	39.94	37.75	44.40
36–40	44.96	44.01	46.33	44.32	40.43	36.97	38.58	36.35	40.52	37.91	41.45
41–45	50.44	51.35	46.53	43.36	41.53	40.18	38.37	37.94	35.79	35.93	42.07
46–50	39.13	39.68	45.02	49.82	47.68	43.44	36.48	36.81	36.07	34.65	40.71
51–55	34.45	36.56	35.70	37.00	37.79	39.78	43.89	41.18	37.99	36.88	38.22
56–60	30.76	28.28	31.09	29.24	31.70	31.23	32.35	34.61	34.66	37.35	32.08
61–65	22.76	24.29	22.59	24.14	24.58	22.80	23.99	25.99	26.29	31.38	24.80
66–70	27.20	24.62	18.36	18.18	17.86	15.32	17.79	16.20	19.86	22.05	19.25
71–75	11.29	10.96	16.27	16.53	16.17	14.82	12.89	13.06	13.95	10.04	13.57
>75	5.26	6.83	7.90	8.70	8.68	11.16	10.14	9.39	8.91	8.72	8.77
Birth Cohort											
1910–29	10.80	10.56	10.79	11.12	9.21	9.76	8.83	7.31	7.61	6.34	9.92
1930–39	26.33	24.67	21.31	20.51	18.23	15.74	14.00	12.48	11.29	8.94	18.04
1940–49	35.23	34.26	31.59	29.82	29.41	24.09	23.33	20.63	19.50	17.94	26.79
1950–59	44.90	45.23	44.78	45.91	42.76	41.17	39.63	38.20	35.49	35.59	41.54
1960–69	47.17	47.59	44.68	43.04	41.91	38.64	37.06	37.38	36.57	35.58	41.00
1970–79	48.32	51.89	45.74	48.66	46.49	45.26	41.98	38.93	38.09	36.36	44.04
1980–89	36.02	42.09	40.76	41.68	42.31	44.02	41.77	40.49	40.34	37.85	40.95
1990–96							19.13	26.56	31.64	32.83	30.10
Educational Level											
Dropouts	47.59	56.37	57.06	58.25	59.78	61.09	60.57	67.10	62.49	60.79	58.78
Basic Secondary	39.40	38.78	37.19	37.30	35.71	34.72	36.13	34.08	33.52	32.79	36.11
Intermediate	42.41	43.18	41.48	41.14	40.02	39.24	36.22	35.82	36.88	35.81	39.12
Maturity Cert.	33.99	36.20	31.68	33.75	33.10	30.16	26.21	27.35	26.90	29.81	30.65
Tertiary Educ.	25.18	26.42	24.59	24.43	23.38	22.04	19.67	19.26	18.07	17.35	21.70
Equivalent Income											
1st (Lowest) Quartile	43.37	43.27	39.49	39.98	40.05	40.59	38.69	39.68	40.02	38.75	40.37
2nd Quartile	38.42	39.14	38.56	37.87	35.81	33.57	32.55	31.48	31.28	31.51	34.99
3rd Quartile	36.07	37.11	35.19	35.61	33.20	30.92	31.98	30.19	29.74	28.99	32.87
4th (Highest) Quartile	32.18	32.53	30.53	30.87	31.32	30.72	26.89	24.83	23.02	22.08	28.48
All	37.16	37.72	35.68	35.84	34.80	33.64	32.20	31.13	30.71	29.96	33.85

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. Basic Secondary = Hauptschulabschluss; Intermediate = Realschulabschluss; Maturity Cert.= Abitur; Tertiary Educ. = Uni-/ Fachhochschulabschluss. Sample reduced to Men.

Table B11: Smoking prevalence among men by year and socio-economic factors: continued

	Year										
	1998	**1999**	**2001**	**2002**	**2004**	**2006**	**2008**	**2010**	**2012**	**2014**	**Total**
	Smoking Prevalence in Per Cent										
Occupation											
Worker	51.29	51.84	49.77	49.05	47.95	45.86	46.46	45.66	44.18	42.62	47.69
Self-employed	35.75	36.36	37.70	34.40	38.55	36.73	31.36	28.76	28.58	29.82	33.93
Employee	32.30	34.40	33.03	33.83	32.81	31.24	29.45	28.61	30.21	29.81	31.48
Civil Servant	31.73	35.54	30.50	30.13	28.29	27.43	24.21	25.76	28.31	23.84	28.76
Unemployed	60.35	55.23	54.11	58.16	56.50	55.94	60.62	56.05	60.26	61.58	57.75
Marital Status											
Single	43.92	46.88	43.72	44.94	44.73	42.18	39.80	36.99	36.50	36.26	41.27
Married	34.01	33.55	31.10	30.69	28.74	27.90	26.48	26.50	26.25	24.80	29.13
Widowed	18.91	17.52	27.18	28.11	28.50	22.31	18.07	16.78	16.03	15.54	20.94
Divorced	54.43	52.96	52.95	52.27	52.03	51.69	50.69	48.21	46.52	45.16	50.36
Region											
West	36.91	37.62	35.50	35.32	34.64	33.63	32.16	31.20	29.97	29.17	33.57
East	38.03	38.09	36.34	37.75	35.41	33.65	32.34	30.84	33.52	33.00	34.89
Place of Residence											
Schleswig-Holstein	27.33	34.46	35.04	36.33	39.70	36.72	32.14	31.90	28.88	28.69	33.27
Hamburg	42.91	43.15	41.22	39.58	44.87	38.94	39.87	43.72	35.83	33.61	40.09
Lower Saxony	34.65	34.98	36.44	36.50	34.51	29.13	29.53	28.18	29.66	26.35	31.96
Bremen	49.48	45.21	41.11	36.10	34.70	30.18	27.03	29.67	20.82	22.48	33.18
North-Rhine-Westfalia	37.08	38.70	38.68	38.74	35.50	36.52	34.91	33.20	31.03	32.49	35.64
Hessen	38.75	38.21	36.17	33.81	34.00	37.16	35.27	30.18	28.64	30.72	34.32
Rhineland-Palatinate	40.62	40.69	38.89	36.28	37.27	35.32	28.66	25.14	27.86	27.90	34.48
Baden-Wuerttemberg	40.04	40.40	33.42	31.94	33.66	31.96	30.92	30.46	27.57	24.37	32.36
Bavaria	33.67	33.47	29.37	31.85	30.78	30.21	30.00	30.79	32.20	29.58	31.17
Saarland			36.70	36.99	38.53	34.08	26.93	33.72	26.87	31.86	33.48
Berlin	46.40	42.47	38.26	42.73	40.78	38.04	35.80	32.97	32.77	31.20	38.16
Brandenburg	42.44	41.16	34.30	37.11	35.46	34.49	36.81	29.73	36.61	39.47	36.76
Mecklenb. Pomerania	33.45	37.26	34.49	37.06	30.71	35.22	35.94	37.66	37.09	35.22	35.44
Saxony	30.31	31.32	33.80	34.44	33.23	30.76	29.72	28.89	31.34	29.09	31.24
Saxony-Anhalt	41.06	43.20	41.87	40.32	35.27	34.57	29.61	30.60	32.87	39.10	36.93
Thuringia	37.80	37.04	35.79	35.95	35.08	30.67	28.17	28.75	32.81	28.68	33.15
All	37.16	37.72	35.68	35.84	34.80	33.64	32.20	31.13	30.71	29.96	33.85

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. Sample reduced to Men. No data available for Saarland in 1998 and 1999. West Germany contains the federal states Schleswig-Holstein, Hamburg, Lower Saxony, Bremen, North-Rhine-Westfalia, Hessen, Rhineland-Palatinate, Baden-Wuerttemberg, Bavaria and Saarland. East Germany contains the federal states Berlin, Brandenburg, Mecklenburg-Western Pomerania, Saxony, Saxony-Anhalt and Thuringia.

Table B12: Smoking prevalence by gender based on the Microcensus, surveys from the RKI and the ESA from 1998 through 2013

	All			Women			Men		
	Microcensus	RKI	ESA	Microcensus	RKI	ESA	Microcensus	RKI	ESA
	Smoking Prevalence in Per Cent								
1998	–	32.5	–	–	27.9	–	–	37.3	–
1999	28.3	–	–	22.2	–	–	34.7	–	–
2000	–	–	34.9	–	–	30.6	–	–	38.9
2001	–	–	–	–	–	–	–	–	–
2002	–	–	–	–	–	–	–	–	–
2003	27.4	32.5	33.9	22.1	28.0	30.5	33.2	37.3	37.1
2004	–	–	–	–	27.0	–	–	36.5	–
2005	27.2	–	–	22.4	–	–	32.2	–	–
2006	–	30.1	31.8	–	27.3	27.8	–	34.8	35.8
2007	–	–	–	–	–	–	–	–	–
2008	–	–	–	–	–	–	–	–	–
2009	25.7	29.9	29.2	21.2	26.1	25.5	30.5	33.9	32.8
2010	–	3–	–	–	26.2	–	–	34.0	–
2011	–	29.7	–	–	26.9	–	–	32.6	–
2012	–	27.6	30.2	–	23.9	26.2	–	31.4	34.0
2013	24.5	–	–	20.3	–	–	29.0	–	–

Note: Microcensus waves 1999, 2003, 2005, 2009 and 2013 (Age >14). Epidemiological Survey waves 2000, 2003, 2006, 2009 and 2012 (Age 18-59 in 2000, 2003; Age 18-64 since 2006). Data supplied by the Robert Koch Institute: BGS wave 1998 (Age 18-79), DEGS1 wave 2011 (Age 18-79), GEDA waves 2009, 2010 and 2012 (Age >17) and GSTel wave 2003, 2004 and 2006 (Age 18-79).

Table B13: Smoking prevalence by educational level, age group and gender in 1998, 2006 and 2014

	Educational Level											
	Basic				Intermediate				High			
	1998	2006	2014	Δ14∗	1998	2006	2014	Δ14∗	1998	2006	2014	Δ14∗
	In Per Cent											
All												
18–30	51.74	50.83	50.99	−1.4	43.94	43.49	36.23	−17.5	31.94	28.33	18.25	−42.9
31–45	51.34	50.66	45.85	−10.7	42.19	38.13	36.04	−14.6	30.35	25.07	20.66	−31.9
46–65	28.38	33.94	38.75	36.5	25.16	30.85	32.25	28.2	20.76	24.40	22.93	10.5
>65	8.40	9.90	11.97	42.5	10.40	17.39	12.30	18.3	15.37	10.72	10.10	−34.3
Women												
18–30	45.55	47.43	44.25	−2.8	36.12	41.06	32.43	−10.2	27.43	25.29	14.99	−45.4
31–45	45.16	51.07	42.72	−5.4	36.94	34.62	32.86	−11.0	26.66	22.23	16.43	−38.4
46–65	20.54	29.90	37.83	84.2	20.48	26.47	27.82	35.8	19.91	22.09	19.83	−0.4
>65	4.59	6.67	10.42	127.3	7.62	16.54	10.22	34.1	18.02	11.20	10.93	−39.3
Men												
18–30	56.46	54.15	55.57	−1.6	53.65	46.52	39.79	−25.8	36.23	32.33	22.16	−38.8
31–45	56.60	50.32	48.34	−14.6	47.81	42.60	40.28	−15.8	33.60	27.89	25.71	−23.5
46–65	36.73	37.92	39.63	7.9	30.62	36.38	38.45	25.6	21.29	26.26	25.85	21.4
>65	15.82	14.33	13.79	−12.9	16.65	19.02	15.36	−7.8	13.14	10.45	9.60	−26.9

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. Sample does not include persons still in school. Basic = Basic secondary school; Intermediate = Intermediate secondary school; High = Maturity certificate or tertiary education. *Growth rate between 1998 and 2014.

Table B14: Smoking prevalence by educational level, birth cohort and gender in 1998, 2006 and 2014

	Educational Level											
	Basic				**Intermediate**				**High**			
	1998	2006	2014	Δ14*	1998	2006	2014	Δ14*	1998	2006	2014	Δ14*
	In Per Cent											
All												
1910–39	12.31	9.57	7.37	−40.1	13.08	17.35	6.30	−51.8	18.52	11.57	6.26	−66.2
1940–49	33.45	22.21	17.68	−47.2	25.98	21.42	16.01	−38.4	20.72	17.27	13.62	−34.3
1950–59	46.98	42.54	38.28	−18.5	38.90	34.10	29.30	−24.7	26.10	26.94	23.68	−9.3
1960–69	52.46	49.57	41.64	−20.6	43.77	38.49	35.04	−19.9	32.10	25.59	23.65	−26.3
1970–79	52.34	51.45	46.55	−11.1	44.39	38.43	34.30	−22.7	31.31	26.44	19.16	−38.8
1980–96		51.84	50.31			45.67	38.17			27.47	19.12	
Women												
1910–39	7.21	6.30	4.55	−37.0	10.21	16.52	7.23	−29.2	18.68	12.27	7.83	−58.1
1940–49	23.92	19.80	17.10	−28.5	20.88	17.15	12.33	−41.0	20.82	15.14	12.81	−38.5
1950–59	40.36	37.02	36.77	−8.9	31.42	29.87	24.33	−22.5	18.80	23.80	18.89	0.5
1960–69	48.24	53.40	43.78	−9.3	39.35	35.90	31.36	−20.3	30.83	25.66	21.35	−30.7
1970–79	45.69	45.58	43.26	−5.3	35.26	32.79	31.39	−11.0	27.74	20.54	15.84	−42.9
1980–96		48.14	44.61			44.90	34.57			24.79	15.18	
Men												
1910–39	20.39	14.25	11.15	−45.3	18.14	18.93	4.73	−73.9	18.43	11.18	5.47	−70.3
1940–49	42.78	24.60	18.26	−57.3	31.86	27.50	21.38	−32.9	20.65	18.53	14.16	−31.4
1950–59	53.87	48.09	39.89	−25.9	46.20	39.24	36.37	−21.3	31.84	29.87	27.84	−12.5
1960–69	55.38	46.70	39.94	−27.9	49.19	41.72	40.07	−18.5	33.37	25.51	26.05	−22.0
1970–79	57.76	57.31	49.35	−14.6	55.61	45.65	38.08	−31.5	34.65	33.24	23.32	−32.7
1980–96		55.47	54.22			46.65	41.87			31.19	23.73	

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. Sample does not include persons still in school. Basic = Basic secondary school; Intermediate = Intermediate secondary school; High = Maturity certificate or tertiary education. *Growth rate between 1998 and 2014.

Table B15: Socio-economic characteristics of female smokers

	Year										
	1998	**1999**	**2001**	**2002**	**2004**	**2006**	**2008**	**2010**	**2012**	**2014**	**Total**
	In Per cent										
Age Group											
18–30	24.93	24.76	21.84	21.73	21.65	23.77	21.92	21.81	22.36	20.88	22.62
31–45	39.22	39.71	38.62	36.82	34.82	33.16	32.69	30.55	28.12	27.34	34.37
46–65	29.60	29.38	32.58	33.97	35.10	34.15	35.58	37.79	38.62	40.98	34.56
>65	6.25	6.14	6.96	7.47	8.44	8.92	9.81	9.86	10.90	10.81	8.45
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Educational Level											
Dropouts	3.12	3.45	3.00	3.12	3.54	4.06	3.55	4.03	3.47	3.61	3.48
Basic Secondary	49.67	48.80	47.83	47.93	46.58	44.54	46.88	42.87	42.27	40.48	45.98
Intermediate	27.31	27.07	27.62	27.69	28.08	29.59	28.37	29.37	31.27	30.40	28.59
Maturity Cert.	7.98	8.37	8.44	8.76	8.94	8.49	8.16	9.77	9.61	11.67	8.97
Tertiary Educ.	11.92	12.31	13.12	12.49	12.85	13.33	13.04	13.96	13.38	13.84	12.99
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Income											
1st Quartile	25.54	25.36	23.77	24.49	25.08	26.58	26.41	27.90	30.57	29.24	26.38
2nd Quartile	25.09	25.69	27.11	26.21	24.60	24.08	25.09	24.78	24.58	26.10	25.35
3rd Quartile	25.26	25.31	25.70	25.88	25.69	24.44	25.63	25.69	24.62	24.80	25.31
4nd Quartile	24.12	23.64	23.42	23.42	24.62	24.89	22.88	21.63	20.23	19.86	22.96
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Occupation											
Worker	44.11	45.34	44.23	43.28	40.12	39.81	44.53	41.94	38.19	35.07	41.85
Self-employed	8.84	9.42	10.85	9.29	11.46	11.43	9.10	8.71	8.97	9.02	9.73
Employee	25.81	27.40	27.87	28.45	26.92	27.26	28.19	29.83	34.10	37.02	29.08
Civil Servant	5.84	6.07	5.13	4.66	4.37	4.66	4.24	4.97	5.23	4.15	4.96
Unemployed	15.40	11.77	11.93	14.32	17.13	16.84	13.94	14.54	13.50	14.74	14.39
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Marital Status											
Single	29.57	31.65	32.06	32.91	35.25	35.48	37.04	37.09	36.29	38.41	34.41
Married	60.23	57.54	55.23	54.12	50.63	49.51	47.82	48.25	48.96	46.45	52.14
Widowed	1.83	1.62	3.01	2.99	3.11	2.70	2.17	2.11	1.91	2.07	2.36
Divorced	8.37	9.19	9.70	9.97	11.01	12.31	12.97	12.55	12.83	13.06	11.10
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. Basic Secondary = Hauptschulabschluss; Intermediate = Realschulabschluss; Maturity Cert.= Abitur; Tertiary Educ. = Uni-/ Fachhochschulabschluss.

Table B16: Socio-economic characteristics of male smokers

	Year										
	1998	**1999**	**2001**	**2002**	**2004**	**2006**	**2008**	**2010**	**2012**	**2014**	**Total**
	In Per cent										
Age Group											
18–30	26.24	26.56	23.79	23.57	24.50	25.60	24.60	23.36	19.87	17.41	23.60
31–45	40.26	39.20	39.53	38.81	37.20	35.17	31.07	28.30	28.71	27.29	34.61
46–65	26.80	27.01	29.87	31.00	30.32	31.06	34.80	38.81	41.85	44.18	33.48
>65	6.70	7.23	6.81	6.62	7.99	8.17	9.52	9.53	9.57	11.12	8.31
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Educational Level											
Dropouts	3.38	3.07	1.83	2.31	2.30	2.53	2.94	3.11	2.92	3.29	2.76
Basic Secondary	44.33	44.90	43.78	45.09	42.67	41.21	41.15	38.60	37.68	38.46	41.81
Intermediate	32.35	32.21	33.31	33.73	34.50	36.15	35.81	37.29	35.95	35.53	34.69
Maturity Cert.	10.24	10.17	9.92	9.12	9.57	9.47	9.41	8.92	9.89	9.30	9.60
Tertiary Educ.	9.70	9.65	11.17	9.75	10.97	10.63	10.69	12.08	13.56	13.43	11.14
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Income											
1st Quartile	31.06	28.96	27.66	29.63	30.98	34.16	32.81	33.16	31.30	34.81	31.45
2nd Quartile	23.35	24.59	25.84	24.05	25.06	23.46	25.34	24.21	24.64	24.06	24.46
3rd Quartile	22.93	22.89	24.66	23.76	21.69	22.43	24.02	22.73	23.74	23.02	23.18
4nd Quartile	22.67	23.56	21.83	22.56	22.28	19.94	17.83	19.90	20.32	18.12	20.91
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Occupation											
Worker	22.10	21.61	23.19	24.48	20.67	20.81	23.58	21.54	16.99	18.65	21.33
Self-employed	6.17	6.61	6.01	4.92	5.49	5.41	5.01	6.01	5.39	5.10	5.60
Employee	55.03	57.08	54.99	52.57	54.28	52.62	54.90	54.26	59.00	57.93	55.24
Civil Servant	3.82	4.42	3.48	3.15	2.40	2.92	2.78	3.91	3.34	4.10	3.42
Unemployed	12.87	10.28	12.34	14.88	17.16	18.24	13.73	14.28	15.28	14.22	14.41
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Marital Status											
Single	25.70	27.62	27.50	28.39	30.57	32.79	31.51	31.85	31.29	30.46	29.80
Married	52.72	50.61	51.49	50.59	46.39	44.40	44.02	43.77	46.01	44.26	47.41
Widowed	7.47	7.56	6.50	6.27	6.66	6.14	7.10	6.52	6.75	6.99	6.79
Divorced	14.11	14.20	14.52	14.76	16.38	16.67	17.37	17.86	15.95	18.29	16.00
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. Basic Secondary = Hauptschulabschluss; Intermediate = Realschulabschluss; Maturity Cert.= Abitur; Tertiary Educ. = Uni-/ Fachhochschulabschluss.

C Smoking Intensity

Table C1: Smoking intensity (CPD) and change in smoking intensity by gender and age group

	Year				Change		
	1998	**2002**	**2006**	**2014**	**Δ98–14**	**Δ02–14**	**Δ06–14**
	In CPD				In Per Cent		
All	16.81	17.04	15.87	14.33	−14.77	−15.89	−9.71
					(0.00)	(0.00)	(0.00)
Women	14.70	14.98	13.93	12.63	−14.05	−15.65	−9.32
					(0.00)	(0.00)	(0.00)
Men	18.30	18.66	17.62	15.82	−13.54	−15.23	−10.22
					(0.00)	(0.00)	(0.00)
18–20	12.31	12.61	11.12	10.32	−16.23	−18.18	−7.24
					(0.00)	(0.00)	(0.11)
21–25	15.96	13.81	13.92	11.28	−29.32	−18.33	−18.95
					(0.00)	(0.00)	(0.00)
26–30	15.39	16.63	13.53	12.98	−15.69	−21.95	−4.06
					(0.00)	(0.00)	(0.21)
31–35	16.18	16.30	15.18	14.54	−10.16	−10.79	−4.23
					(0.00)	(0.00)	(0.14)
36–40	18.04	17.81	15.93	14.11	−21.78	−20.80	−11.46
					(0.00)	(0.00)	(0.00)
41–45	20.32	18.67	17.20	14.79	−27.20	−20.79	−13.99
					(0.00)	(0.00)	(0.00)
46–50	18.39	19.43	18.99	15.04	−18.20	−22.60	−20.82
					(0.00)	(0.00)	(0.00)
51–55	17.06	18.71	18.05	16.01	−6.10	−14.40	−11.26
					(0.07)	(0.00)	(0.00)
56–60	17.76	17.97	17.40	15.59	−12.24	−13.25	−10.44
					(0.00)	(0.00)	(0.00)
61–65	16.25	17.34	15.68	15.15	−6.77	−12.64	−3.38
					(0.14)	(0.00)	(0.41)
66–70	13.61	16.17	15.20	14.76	8.41	−8.74	−2.93
					(0.16)	(0.10)	(0.56)
71–75	11.76	13.13	13.96	14.22	20.93	8.30	1.82
					(0.03)	(0.24)	(0.83)
>75	11.70	13.83	12.61	11.57	−1.12	−16.36	−8.27
					(0.92)	(0.10)	(0.30)

Note: SOEP waves 1998, 2002, 2006 and 2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = cigarettes per day. Smoking intensity is defined as average number of CPD per smoker. For 1998, the number of CPD is approximated. P-values in parentheses.

Table C2: Smoking intensity (CPD) and change in smoking intensity by birth cohort, educational level and income quartile

	Year				Change		
	1998	**2002**	**2006**	**2014**	**Δ98–14**	**Δ02–14**	**Δ06–14**
	In CPD				In Per Cent		
1910–1929	12.26	13.12	12.31				
1930–1939	15.75	16.50	14.81	11.96	−24.08	−27.53	−19.29
					(0.00)	(0.00)	(0.00)
1940–1949	17.87	18.17	16.42	14.88	−16.76	−18.10	−9.41
					(0.00)	(0.00)	(0.00)
1950–1959	19.25	19.13	18.55	15.43	−19.85	−19.37	−16.83
					(0.00)	(0.00)	(0.00)
1960–1969	16.60	17.59	16.99	15.51	−6.61	−11.86	−8.71
					(0.00)	(0.00)	(0.00)
1970–1979	15.35	15.80	14.43	14.25	−7.17	−9.84	−1.27
					(0.00)	(0.00)	(0.54)
1980–1989	11.71	12.57	13.02	13.44	14.69	6.91	3.22
					(0.50)	(0.00)	(0.00)
1990–1996				11.14			
Dropouts	18.09	20.57	20.72	15.54	−14.14	−24.46	−25.01
					(0.00)	(0.00)	(0.00)
Basic Secondary	18.25	17.90	16.99	15.82	−13.34	−11.64	−6.90
					(0.00)	(0.00)	(0.00)
Intermediate	16.13	16.55	15.11	14.41	−10.63	−12.90	−4.64
					(0.00)	(0.00)	(0.00)
Maturity Certificate	14.14	15.08	14.35	12.31	−12.95	−18.36	−14.20
					(0.00)	(0.00)	(0.00)
Tertiary Education	15.14	16.20	14.51	11.90	−21.41	−26.58	−18.01
					(0.00)	(0.00)	(0.00)
1st (Lowest) Inc. Quartile	16.76	16.85	16.20	14.41	−14.05	−14.51	−11.08
					(0.00)	(0.00)	(0.00)
2nd Inc. Quartile	16.50	17.05	15.62	14.98	−9.23	−12.12	−4.06
					(0.00)	(0.00)	(0.03)
3rd Inc. Quartile	16.82	16.69	15.68	14.36	−14.62	−13.97	−8.42
					(0.00)	(0.00)	(0.00)
4th (Highest) Inc. Quartile	17.19	17.62	15.90	13.24	−22.98	−24.87	−16.75
					(0.00)	(0.00)	(0.00)

Note: SOEP waves 1998, 2002, 2006 and 2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = cigarettes per day. Smoking intensity is defined as average number of CPD per smoker. For 1998, the number of CPD is approximated. Basic Secondary = Hauptschulabschluss; Intermediate = Realschulabschluss; Maturity Cert. = Abitur; Tertiary Educ. = Uni-/ Fachhochschulabschluss. Due to sample size, the smoking intensity of the 1910–29 birth cohort is not portrayed after 2006. P-values in parentheses.

Table C3: Smoking intensity (CPD) and change in smoking intensity by region

	Year				Change		
	1998	**2002**	**2006**	**2014**	**Δ98–14**	**Δ02–14**	**Δ06–14**
	In CPD				In Per Cent		
East (with Berlin)	15.11	15.32	14.47	13.48	−10.80	−12.00	−6.83
					(0.00)	(0.00)	(0.00)
West	17.27	17.50	16.24	14.58	−15.59	−16.69	−10.23
					(0.00)	(0.00)	(0.00)
Schleswig-Holstein	17.48	19.20	16.69	15.01	−14.15	−21.83	−10.05
					(0.00)	(0.00)	(0.03)
Hamburg	18.82	18.78	15.23	13.14	−30.20	−30.06	−13.74
					(0.00)	(0.00)	(0.06)
Lower Saxony	16.97	16.81	16.88	15.41	−9.21	−8.31	−8.71
					(0.00)	(0.01)	(0.01)
Bremen	21.56	15.50	14.85	11.00	−48.97	−29.00	−25.90
					(0.00)	(0.00)	(0.01)
North-Rhine-Westfalia	18.24	18.20	17.11	15.31	−16.09	−15.88	−10.55
					(0.00)	(0.00)	(0.00)
Hessen	16.81	17.37	15.60	13.71	−18.41	−21.04	−12.11
					(0.00)	(0.00)	(0.00)
Rhineland-Palatinate	17.62	18.60	18.58	15.72	−10.81	−15.48	−15.38
					(0.01)	(0.00)	(0.00)
Baden-Wuerttemberg	16.21	16.44	15.10	13.04	−19.54	−20.70	−13.62
					(0.00)	(0.00)	(0.00)
Bavaria	16.30	16.81	14.98	14.15	−13.21	−15.87	−5.54
					(0.00)	(0.00)	(0.03)
Saarland		17.95	16.85	16.93		−5.69	0.49
						(0.52)	(0.96)
Berlin	19.20	17.46	16.29	13.50	−29.66	−22.67	−17.10
					(0.00)	(0.00)	(0.00)
Brandenburg	13.74	15.10	14.18	14.98	9.00	−0.83	5.65
					(0.07)	(0.84)	(0.22)
Mecklenb. Pomerania	14.23	15.50	15.20	15.32	7.71	−1.16	0.78
					(0.18)	(0.82)	(0.88)
Saxony	14.91	14.18	13.31	12.54	−15.90	−11.53	−5.79
					(0.00)	(0.00)	(0.21)
Saxony-Anhalt	13.71	14.96	13.47	13.74	0.25	−8.17	2.00
					(0.96)	(0.05)	(0.64)
Thuringia	12.81	13.87	13.64	11.32	−11.67	−18.41	−17.07
					(0.01)	(0.00)	(0.00)

Note: SOEP waves 1998, 2002, 2006 and 2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = cigarettes per day. Smoking intensity is defined as average number of CPD per smoker. For 1998, the number of CPD is approximated. P-values in parentheses. No data available for Saarland in 1998. West Germany contains the federal states Schleswig-Holstein, Hamburg, Lower Saxony, Bremen, North-Rhine-Westfalia, Hessen, Rhineland-Palatinate, Baden-Wuerttemberg, Bavaria and Saarland. East Germany contains the federal states Berlin, Brandenburg, Mecklenburg-Western Pomerania, Saxony, Saxony-Anhalt and Thuringia.

Table C4: Smoking intensity (CPD) and change in smoking intensity by occupational position and marital status

	Year				Change		
	1998	**2002**	**2006**	**2014**	**Δ98–14**	**Δ02–14**	**Δ06–14**
	In CPD				In Per Cent		
Worker	18.80	18.70	17.51	16.16	−14.05	−13.61	−7.71
					(0.00)	(0.00)	(0.00)
Self-employed	19.94	19.84	17.90	14.30	−28.29	−27.92	−20.12
					(0.00)	(0.00)	(0.00)
Employee	15.93	16.34	15.03	13.38	−16.04	−18.16	−10.99
					(0.00)	(0.00)	(0.00)
Civil Servant	18.38	17.39	15.79	12.70	−30.90	−26.95	−19.54
					(0.00)	(0.00)	(0.00)
Unemployed	17.83	18.10	17.95	15.90	−10.81	−12.15	−11.44
					(0.00)	(0.00)	(0.00)
Married	15.89	16.16	14.66	13.11	−17.51	−18.89	−10.61
					(0.00)	(0.00)	(0.00)
Single	17.18	17.28	16.12	14.67	−14.60	−15.12	−8.98
					(0.00)	(0.00)	(0.00)
Widowed	15.24	16.60	15.69	14.98	−1.67	−9.73	−4.49
					(0.79)	(0.06)	(0.44)
Divorced	17.81	18.46	18.02	15.72	−11.74	−14.84	−12.76
					(0.00)	(0.00)	(0.00)
0–20 CPD	13.51	13.87	13.07	12.37	−8.48	−10.81	−5.40
					(0.00)	(0.00)	(0.00)
>20 CPD	31.81	31.43	31.69	29.62	−6.88	−5.76	−6.55
					(0.00)	(0.00)	(0.00)

Note: SOEP waves 1998, 2002, 2006 and 2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = cigarettes per day. Smoking intensity is defined as average number of CPD per smoker. For 1998, the number of CPD is approximated. P-values in parentheses.

Table C5: Smoking intensity (CPD) by year and socio-economic factors (all)

	Year									
	1998	**2001**	**2002**	**2004**	**2006**	**2008**	**2010**	**2012**	**2014**	**Total**
	Smoking Intensity in CPD									
Gender										
Women	14.70	14.98	14.98	14.20	13.93	13.51	12.96	12.98	12.63	13.89
Men	18.30	18.25	18.66	18.12	17.62	16.90	16.83	16.09	15.82	17.47
Age Group										
18–20	12.31	13.12	12.61	11.59	11.12	10.67	11.16	10.25	10.32	11.63
21–25	15.96	14.38	13.81	13.30	13.92	12.31	12.10	11.90	11.28	13.31
26–30	15.39	15.32	16.63	15.54	13.53	13.34	13.62	13.13	12.98	14.42
31–35	16.18	16.82	16.30	15.78	15.18	14.78	13.58	13.39	14.54	15.36
36–40	18.04	17.91	17.81	16.43	15.93	15.39	14.89	14.97	14.11	16.50
41–45	20.32	18.96	18.67	17.78	17.20	16.17	15.06	14.93	14.79	17.25
46–50	18.39	19.03	19.43	19.04	18.99	17.27	17.60	16.47	15.04	17.94
51–55	17.06	18.51	18.71	17.96	18.05	18.28	17.36	16.40	16.01	17.55
56–60	17.76	17.37	17.97	17.33	17.40	16.18	15.93	15.91	15.59	16.72
61–65	16.25	16.04	17.34	16.66	15.68	16.21	16.11	16.13	15.15	16.18
66–70	13.61	13.78	16.17	16.15	15.20	15.92	15.46	15.23	14.76	15.16
71–75	11.76	12.98	13.13	13.85	13.96	14.33	15.16	14.37	14.22	13.85
>75	11.70	12.15	13.83	12.97	12.61	12.37	12.05	11.24	11.57	12.27
Birth Cohort										
1910–29	12.26	12.09	13.12	12.42	12.31	10.88	11.66	9.73	9.68	12.15
1930–39	15.75	15.20	16.50	15.65	14.81	15.21	14.39	13.67	11.96	15.22
1940–49	17.87	17.67	18.17	17.54	16.42	16.09	15.83	14.98	14.88	16.89
1950–59	19.25	19.01	19.13	18.34	18.55	17.34	16.73	16.20	15.43	17.93
1960–69	16.60	17.59	17.59	16.85	16.99	16.50	16.33	16.06	15.51	16.72
1970–79	15.35	15.15	15.80	15.72	14.43	15.09	14.23	14.63	14.25	14.99
1980–89	11.71	13.30	12.57	12.52	13.02	12.08	12.88	12.56	13.44	12.76
1990–96						9.36	11.16	11.34	11.14	11.10
Educational Level										
Dropouts	18.09	20.10	20.57	19.53	20.72	18.87	17.05	18.20	15.54	18.68
Basic Secondary School	18.25	17.87	17.90	17.59	16.99	16.51	16.40	16.01	15.82	17.13
Intermediate Secondary School	16.13	16.34	16.55	15.50	15.11	14.60	14.62	14.34	14.41	15.29
Maturity Certificate	14.14	14.78	15.08	14.64	14.35	12.98	12.94	13.27	12.31	13.85
Tertiary Education	15.14	15.33	16.20	14.77	14.51	14.72	13.43	12.25	11.90	14.23
Equivalent Income										
1st (Lowest) Quartile	16.76	16.37	16.85	16.11	16.20	15.31	15.46	15.33	14.41	15.86
2nd Quartile	16.50	17.13	17.05	16.40	15.62	15.00	14.85	15.26	14.98	15.91
3rd Quartile	16.82	16.90	16.69	16.47	15.68	15.58	15.21	13.76	14.36	15.78
4th (Highest) Quartile	17.19	16.94	17.62	16.42	15.90	15.47	14.37	13.85	13.24	15.84
All	16.81	16.84	17.04	16.34	15.87	15.33	15.03	14.64	14.33	15.85

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = Cigarettes per day. Smoking intensity is defined as the average number of CPD per smoker. For 1998 and 2001, the number of CPD are approximated. No numbers of CPD available for wave 1999. Due to sample size, the smoking intensity of the 1910–29 birth cohort is not portrayed after 2006. Basic Secondary School = Hauptschulabschluss; Intermediate Secondary School = Realschulabschluss; Maturity Certificate = Abitur; Tertiary Education = Uni-/ Fachhochschulabschluss.

Table C6: Smoking intensity (CPD) by year and socio-economic factors (all): continued

	Year									
	1998	**2001**	**2002**	**2004**	**2006**	**2008**	**2010**	**2012**	**2014**	**Total**
	Smoking Intensity in CPD									
Occupational Position										
Worker	18.80	18.82	18.70	18.16	17.51	17.39	17.02	16.95	16.16	17.82
Self-employed	19.94	19.89	19.84	19.22	17.90	16.38	15.63	13.92	14.30	17.69
Employee	15.93	16.15	16.34	15.54	15.03	13.89	13.87	13.17	13.38	14.77
Civil Servant	18.38	16.93	17.39	16.86	15.79	15.56	13.42	13.85	12.70	15.79
Unemployed	17.83	17.37	18.10	17.28	17.95	16.87	16.12	16.39	15.90	17.14
Marital Status										
Single	15.89	15.96	16.16	15.15	14.66	13.89	14.12	13.45	13.11	14.70
Married	17.18	17.14	17.28	16.84	16.12	15.79	15.23	14.96	14.67	16.25
Widowed	15.24	15.48	16.60	15.33	15.69	15.82	15.71	15.36	14.98	15.59
Divorced	17.81	18.09	18.46	17.70	18.02	17.18	16.39	16.13	15.72	17.25
Region										
West	17.27	17.25	17.50	16.85	16.24	15.73	15.33	14.99	14.58	16.25
East (with Berlin)	15.11	15.24	15.32	14.42	14.47	13.85	13.89	13.41	13.48	14.38
Place of Residence										
Schleswig-Holstein	17.48	19.08	19.20	18.60	16.69	15.89	17.29	15.05	15.01	17.30
Hamburg	18.82	18.12	18.78	18.01	15.23	15.06	14.17	14.36	13.14	16.23
Lower Saxony	16.97	17.16	16.81	16.69	16.88	16.53	16.36	15.67	15.41	16.52
Bremen	21.56	16.53	15.50	14.98	14.85	14.12	12.41	12.44	11.00	15.13
North-Rhine-Westfalia	18.24	17.80	18.20	17.27	17.11	16.19	15.79	16.12	15.31	16.95
Hessen	16.81	17.51	17.37	16.72	15.60	14.63	14.65	13.64	13.71	15.73
Rhineland-Palatinate	17.62	17.56	18.60	17.72	18.58	17.79	15.89	15.61	15.72	17.33
Baden-Wuerttemberg	16.21	16.37	16.44	16.24	15.10	15.13	15.20	13.94	13.04	15.39
Bavaria	16.30	15.96	16.81	15.86	14.98	14.90	14.25	14.25	14.15	15.27
Saarland		19.55	17.95	18.26	16.85	20.33	16.13	16.53	16.93	17.77
Berlin	19.20	17.59	17.46	15.89	16.29	14.80	15.29	13.07	13.50	16.03
Brandenburg	13.74	14.44	15.10	14.26	14.18	13.55	13.87	14.18	14.98	14.25
Mecklenb. Pomerania	14.23	15.26	15.50	13.94	15.20	16.88	16.02	14.56	15.32	15.26
Saxony	14.91	14.20	14.18	13.58	13.31	12.54	12.05	13.05	12.54	13.39
Saxony-Anhalt	13.71	14.73	14.96	14.38	13.47	13.34	12.71	13.47	13.74	13.89
Thuringia	12.81	14.32	13.87	13.47	13.64	12.41	13.55	12.26	11.32	13.09
Smoker Type										
Non-heavy Smoker	13.51	13.64	13.87	13.29	13.07	12.68	12.57	12.39	12.37	13.06
Heavy Smoker	31.81	31.44	31.43	31.45	31.69	30.61	30.91	29.84	29.62	31.11
All	16.81	16.84	17.04	16.34	15.87	15.33	15.03	14.64	14.33	15.85

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = Cigarettes per day. Smoking intensity is defined as the average number of CPD per smoker. For 1998 and 2001, the number of CPD are approximated. No numbers of CPD available for wave 1999. No data available for Saarland in 1998 and 1999. West Germany contains the federal states Schleswig-Holstein, Hamburg, Lower Saxony, Bremen, North-Rhine-Westfalia, Hessen, Rhineland-Palatinate, Baden-Wuerttemberg, Bavaria and Saarland. East Germany contains the federal states Berlin, Brandenburg, Mecklenburg-Western Pomerania, Saxony, Saxony-Anhalt and Thuringia.

Table C7: Smoking intensity (CPD) by year and socio-economic factors (female smoker)

	Year									
	1998	**2001**	**2002**	**2004**	**2006**	**2008**	**2010**	**2012**	**2014**	**Total**
	Smoking Intensity in CPD									
Age Group										
18–20	11.80	12.51	11.74	9.45	10.95	10.10	10.80	11.14	9.73	11.09
21–25	15.02	13.17	12.96	12.75	12.32	11.69	10.61	11.00	9.36	12.20
26–30	13.68	13.41	14.93	13.95	11.91	11.65	12.07	12.51	11.46	12.85
31–35	14.52	14.31	14.42	13.21	13.31	12.38	11.96	11.86	12.87	13.39
36–40	16.39	16.69	15.84	14.79	13.97	13.58	13.62	13.40	12.11	14.80
41–45	16.62	16.03	16.05	15.52	15.94	14.02	12.47	13.20	13.57	14.88
46–50	15.70	16.71	16.18	14.89	15.72	15.68	14.54	13.89	13.31	15.12
51–55	13.86	16.33	15.91	15.23	15.52	15.16	14.08	13.96	13.90	14.82
56–60	14.67	16.10	15.18	15.77	14.32	14.34	14.57	13.30	13.20	14.45
61–65	13.71	13.43	15.88	15.23	14.14	14.92	13.13	14.18	12.82	14.13
66–70	13.28	12.67	13.17	13.30	13.06	13.08	14.42	14.12	13.59	13.46
71–75	11.19	12.80	12.50	11.23	10.99	13.37	11.57	12.25	13.39	12.27
>75	11.19	13.07	14.48	12.52	11.94	12.43	11.36	9.57	10.23	11.92
Birth Cohort										
1910–29	11.76	13.03	14.24	12.02	12.45	13.84	12.26	9.77	9.38	12.61
1930–39	14.07	12.50	13.79	12.85	12.07	12.66	11.24	10.24	10.04	12.57
1940–49	14.36	16.06	15.68	15.67	14.03	14.04	13.72	13.49	13.76	14.67
1950–59	15.90	16.16	16.22	15.18	15.45	14.78	14.31	13.79	13.13	15.06
1960–69	15.14	15.89	15.40	14.73	15.37	14.62	13.51	13.78	13.47	14.70
1970–79	14.29	13.67	14.53	13.96	12.77	13.13	12.77	13.01	12.80	13.46
1980–89	10.55	12.16	11.83	11.58	11.84	11.22	11.37	11.73	11.79	11.62
1990–96						9.17	10.80	11.60	9.76	10.49
Educational Level										
Dropouts	16.13	18.19	18.61	16.25	16.38	14.63	12.79	16.00	14.67	15.75
Basic Secondary School	15.79	15.66	15.53	15.21	14.91	14.30	14.07	13.97	13.96	14.87
Intermediate Secondary School	14.24	14.71	14.57	13.71	13.53	13.43	12.60	12.70	12.59	13.54
Maturity Certificate	12.86	13.16	13.74	12.38	12.78	11.74	12.37	12.56	10.87	12.52
Tertiary Education	13.55	14.24	14.47	13.16	12.66	13.11	11.45	10.76	10.51	12.54
Equivalent Income										
1st (Lowest) Quartile	15.08	14.89	14.90	14.55	14.41	14.00	13.51	13.97	13.18	14.26
2nd Quartile	14.40	15.27	15.34	14.64	13.79	13.36	13.37	13.33	13.08	14.08
3rd Quartile	14.85	14.71	14.49	13.25	13.85	13.32	12.29	12.01	12.19	13.47
4th (Highest) Quartile	14.33	15.06	15.20	14.12	13.37	13.10	12.30	12.17	11.52	13.57
All	14.70	14.98	14.98	14.20	13.93	13.51	12.96	12.98	12.63	13.89

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = Cigarettes per day. Smoking intensity is defined as the average number of CPD per smoker. For 1998 and 2001, the number of CPD are approximated. No numbers of CPD available for wave 1999. Sample reduced to women. Due to sample size, the smoking intensity of the 1910–29 birth cohort is not portrayed after 2002. Basic Secondary School = Hauptschulabschluss; Intermediate Secondary School = Realschulabschluss; Maturity Certificate = Abitur; Tertiary Education = Uni-/ Fachhochschulabschluss.

Table C8: Smoking intensity (CPD) by year and socio-economic factors (female smoker): continued

	Year									
	1998	**2001**	**2002**	**2004**	**2006**	**2008**	**2010**	**2012**	**2014**	**Total**
	Smoking Intensity in CPD									
Occupational Position										
Worker	14.98	15.85	15.38	15.26	14.89	14.82	14.24	13.65	13.47	14.78
Self-employed	16.12	15.67	15.59	14.51	14.47	14.67	13.55	12.20	11.21	14.23
Employee	15.22	15.27	14.78	13.91	13.46	12.97	12.51	12.08	12.08	13.52
Civil Servant	14.69	15.25	15.03	13.83	12.25	11.27	8.98	10.11	9.26	12.09
Unemployed	15.06	14.98	16.37	15.97	16.40	15.67	13.88	15.65	15.47	15.55
Marital Status										
Single	14.07	14.09	14.31	13.37	12.91	12.30	11.92	12.09	11.27	12.89
Married	14.88	15.17	15.09	14.52	14.15	13.65	13.25	12.99	12.75	14.12
Widowed	14.06	13.90	14.76	12.51	13.42	13.97	13.97	14.01	13.88	13.83
Divorced	15.47	16.38	15.98	15.36	15.50	15.26	13.85	14.02	13.80	15.04
Region										
West	15.20	15.43	15.51	14.71	14.28	13.72	13.07	13.30	12.94	14.26
East (with Berlin)	12.66	13.10	12.79	12.24	12.56	12.77	12.57	11.81	11.59	12.45
Smoker Type										
Non-heavy Smoker	12.67	12.89	13.04	12.44	12.28	11.86	11.53	11.52	11.32	12.17
Heavy Smoker	30.74	30.80	29.99	29.78	30.07	29.08	29.00	28.35	28.62	29.71
All	14.70	14.98	14.98	14.20	13.93	13.51	12.96	12.98	12.63	13.89

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = Cigarettes per day. Smoking intensity is defined as the average number of CPD per smoker. For 1998 and 2001, the number of CPD are approximated. No numbers of CPD available for wave 1999. Sample reduced to women. No data available for Saarland in 1998 and 1999. West Germany contains the federal states Schleswig-Holstein, Hamburg, Lower Saxony, Bremen, North-Rhine-Westfalia, Hessen, Rhineland-Palatinate, Baden-Wuerttemberg, Bavaria and Saarland. East Germany contains the federal states Berlin, Brandenburg, Mecklenburg-Western Pomerania, Saxony, Saxony-Anhalt and Thuringia.

Table C9: Smoking intensity (CPD) by year and socio-economic factors (male smoker)

	Year									
	1998	**2001**	**2002**	**2004**	**2006**	**2008**	**2010**	**2012**	**2014**	**Total**
	Smoking Intensity in CPD									
Age Group										
18–20	12.69	13.69	13.44	13.30	11.28	11.15	11.41	9.65	10.60	12.07
21–25	16.67	15.33	14.44	13.88	15.55	12.80	13.48	12.56	12.83	14.24
26–30	16.67	16.86	18.09	16.85	14.93	15.26	15.10	13.60	14.05	15.75
31–35	17.47	18.81	17.85	17.53	16.66	16.59	14.77	14.75	15.90	16.91
36–40	19.24	18.87	19.49	18.02	17.85	16.81	15.75	16.19	15.92	17.91
41–45	22.70	21.17	20.71	19.96	18.48	18.04	17.57	16.57	15.84	19.28
46–50	20.20	20.80	21.75	21.88	21.83	18.96	20.66	19.06	16.82	20.35
51–55	19.46	20.00	20.89	20.17	20.16	20.72	19.95	18.70	18.11	19.80
56–60	19.32	18.19	20.12	18.52	20.05	17.60	17.35	18.18	17.78	18.53
61–65	17.81	17.68	18.32	17.55	16.89	17.20	18.28	18.05	17.23	17.70
66–70	13.76	14.36	18.12	18.08	17.11	18.71	16.37	16.15	15.71	16.42
71–75	12.28	13.11	13.49	15.53	15.72	15.17	18.39	16.37	15.19	15.14
>75	12.80	10.93	12.76	13.70	13.27	12.32	12.55	12.51	12.88	12.64
Birth Cohort										
1910–29	12.79	11.10	11.82	12.98	12.14	7.61	10.97	9.70	9.93	11.62
1930–39	16.65	16.67	18.04	17.36	16.82	17.32	16.74	16.33	13.90	16.91
1940–49	19.99	18.74	20.07	18.85	18.35	17.71	17.48	16.36	15.87	18.53
1950–59	21.46	21.17	21.30	20.84	21.21	19.60	18.90	18.43	17.58	20.26
1960–69	17.77	18.96	19.46	18.84	18.61	18.26	19.10	18.31	17.55	18.56
1970–79	16.13	16.36	16.74	17.09	15.79	16.51	15.26	15.96	15.53	16.18
1980–89	12.57	14.26	13.29	13.40	14.17	12.88	14.30	13.24	14.72	13.77
1990–96						9.54	11.41	11.18	12.02	11.51
Educational Level										
Dropouts	19.58	20.98	21.66	21.21	23.04	21.78	19.85	19.75	16.20	20.51
Basic Secondary School	19.78	19.38	19.62	19.36	18.69	18.16	18.19	17.57	17.34	18.79
Intermediate Secondary School	17.70	17.81	18.41	17.29	16.86	15.88	16.92	16.02	16.33	17.06
Maturity Certificate	15.30	16.22	16.16	16.65	15.90	14.22	13.41	13.91	13.31	15.00
Tertiary Education	16.04	16.02	17.35	16.02	15.96	15.99	15.04	13.65	13.13	15.50
Equivalent Income										
1st (Lowest) Quartile	18.20	17.69	18.69	17.68	18.20	16.70	17.43	16.53	15.68	17.43
2nd Quartile	17.89	18.48	18.28	17.88	17.22	16.40	16.10	16.91	16.49	17.36
3rd Quartile	18.06	18.50	18.27	18.70	17.20	17.40	17.43	15.23	16.13	17.52
4th (Highest) Quartile	19.07	18.28	19.52	18.21	17.79	17.13	16.10	15.40	14.68	17.59
All	18.30	18.25	18.66	18.12	17.62	16.90	16.83	16.09	15.82	17.47

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = Cigarettes per day. Smoking intensity is defined as the average number of CPD per smoker. For 1998 and 2001, the number of CPD are approximated. No numbers of CPD available for wave 1999. Sample reduced to men. Due to sample size, the smoking intensity of the 1910–29 birth cohort is not portrayed after 2002. Basic Secondary School = Hauptschulabschluss; Intermediate Secondary School = Realschulabschluss; Maturity Certificate = Abitur; Tertiary Education = Uni-/ Fachhochschulabschluss.

Table C10: Smoking intensity (CPD) by year and socio-economic factors (male smoker): continued

	Year									
	1998	**2001**	**2002**	**2004**	**2006**	**2008**	**2010**	**2012**	**2014**	**Total**
	Smoking Intensity in CPD									
Occupational Position										
Worker	19.86	19.82	19.94	19.22	18.59	18.43	18.19	18.13	17.34	18.95
Self-employed	21.45	21.40	21.40	20.95	19.24	17.16	16.99	14.83	15.81	19.18
Employee	16.77	17.25	18.34	17.97	17.53	15.32	15.97	14.72	15.03	16.51
Civil Servant	19.73	17.67	18.52	18.04	17.70	17.85	16.71	16.00	15.76	17.74
Unemployed	19.15	18.96	19.30	18.20	19.27	17.73	17.99	17.07	16.24	18.29
Marital Status										
Single	17.01	17.17	17.39	16.41	16.09	15.04	15.73	14.44	14.35	15.97
Married	18.60	18.54	18.93	18.63	17.74	17.52	16.81	16.62	16.31	17.88
Widowed	18.59	18.08	19.81	20.26	20.32	21.17	20.20	19.71	18.36	19.59
Divorced	20.56	20.01	21.30	20.62	21.09	19.40	19.63	18.41	18.00	19.86
Region										
West	18.77	18.69	19.13	18.65	18.03	17.48	17.27	16.50	16.02	17.91
East (with Berlin)	16.64	16.67	17.06	16.17	16.10	14.77	15.10	14.71	15.13	15.88
Smoker Type										
Non-heavy Smoker	14.20	14.29	14.62	14.10	13.89	13.47	13.58	13.23	13.36	13.88
Heavy Smoker	32.18	31.69	31.99	32.07	32.37	31.27	31.66	30.53	30.07	31.67
All	18.30	18.25	18.66	18.12	17.62	16.90	16.83	16.09	15.82	17.47

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = Cigarettes per day. Smoking intensity is defined as the average number of CPD per smoker. For 1998 and 2001, the number of CPD are approximated. No numbers of CPD available for wave 1999. Sample reduced to men. No data available for Saarland in 1998 and 1999. West Germany contains the federal states Schleswig-Holstein, Hamburg, Lower Saxony, Bremen, North-Rhine-Westfalia, Hessen, Rhineland-Palatinate, Baden-Wuerttemberg, Bavaria and Saarland. East Germany contains the federal states Berlin, Brandenburg, Mecklenburg-Western Pomerania, Saxony, Saxony-Anhalt and Thuringia.

Table C11: Smoking intensity (CPD) by educational level and year for persons born between 1960–1996 and 1910–1959

	Year									
	1998	**2001**	**2002**	**2004**	**2006**	**2008**	**2010**	**2012**	**2014**	**Total**
	Smoking Intensity in CPD									
Persons born between 1960–1996										
Basic Secondary School	18.28	17.72	17.61	17.39	16.75	16.36	16.40	16.10	16.08	16.93
Intermediate Secondary School	15.23	15.88	15.95	14.89	14.66	14.13	14.33	14.35	14.25	14.82
Maturity Certificate	13.84	14.24	14.67	13.68	13.42	12.50	12.83	12.90	12.09	13.33
Tertiary Education	12.94	14.55	14.30	13.68	12.85	12.97	11.60	11.04	11.25	12.60
Persons born between 1910–1959										
Basic Secondary School	18.25	17.95	18.12	17.76	17.25	16.68	16.41	15.89	15.44	17.32
Intermediate Secondary School	17.58	17.18	17.71	16.74	16.18	15.76	15.41	14.30	14.92	16.37
Maturity Certificate	15.02	16.66	16.65	18.92	19.10	16.05	13.80	16.15	13.79	16.36
Tertiary Education	16.46	15.90	17.58	15.81	16.24	16.67	16.13	14.46	13.12	15.97
All	16.78	16.75	16.94	16.24	15.71	15.21	14.95	14.53	14.29	15.76

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = Cigarettes per day. Smoking intensity is defined as the average number of CPD per smoker. For 1998 and 2001, the number of CPD are approximated. No numbers of CPD available for wave 1999. Basic Secondary School = Hauptschulabschluss; Intermediate Secondary School = Realschulabschluss; Maturity Certificate = Abitur; Tertiary Education = Uni-/ Fachhochschulabschluss.

Table C12: Transition matrix between consumption groups (in CPD) from 2002 through 2008

	Smoking Intensity (CPD) in 2004							
CPD in 2002	**1–5**	**6–10**	**11–15**	**16–20**	**>20**	**Quitters**	**Total**	**N**
	In Per Cent							
1–5	56.83	19.08	4.33	3.30	0.91	15.54	100.00	235
6–10	14.23	54.66	17.55	4.65	0.30	8.61	100.00	447
11–15	2.02	27.08	36.44	26.71	1.68	6.08	100.00	398
16–20	1.41	9.88	14.71	53.13	15.99	4.87	100.00	671
>20	0.28	2.67	3.20	26.16	63.69	4.01	100.00	357
N	218	475	329	610	320	156	2,108	
	Smoking Intensity (CPD) in 2006							
CPD in 2004	**1–5**	**6–10**	**11–15**	**16–20**	**>20**	**Quitters**	**Total**	**N**
	In Per Cent							
1–5	47.96	35.85	5.84	2.51	0.43	7.40	100.00	263
6–10	10.20	55.71	19.15	5.72	1.11	8.11	100.00	502
11–15	4.03	22.19	44.07	22.13	1.64	5.94	100.00	328
16–20	2.48	6.79	15.94	58.62	12.34	3.83	100.00	622
>20	0.32	1.66	4.43	29.96	58.24	5.40	100.00	317
N	209	492	354	576	273	128	2,032	
	Smoking Intensity (CPD) in 2008							
CPD in 2006	**1–5**	**6–10**	**11–15**	**16–20**	**>20**	**Quitters**	**Total**	**N**
	In Per Cent							
1–5	49.17	29.52	4.78	4.58	0.00	11.95	100.00	231
6–10	10.78	56.74	16.86	7.83	0.30	7.49	100.00	508
11–15	1.15	26.30	42.17	27.63	0.51	2.23	100.00	356
16–20	0.66	9.32	11.25	57.66	15.87	5.25	100.00	591
>20	0.14	2.50	7.74	18.12	64.71	6.80	100.00	274
N	182	483	359	543	277	116	1,960	

Note: SOEP waves 2002–2014. Balanced Panel. Data weighted by expansion factors supplied in the data set. CPD = Cigarettes per day. Quitters are defined as smokers, who quit smoking during the period of observation and did not start smoking again. Sample size (N) not weighted.

Table C13: Transition matrix between consumption groups (in CPD) from 2008 through 2014

	Smoking Intensity (CPD) in 2010							
CPD in 2008	**1–5**	**6–10**	**11–15**	**16–20**	**>20**	**Quitters**	**Total**	**N**
	In Per Cent							
1–5	68.59	19.06	2.30	3.73	0.00	6.32	100.00	205
6–10	12.15	52.32	23.72	8.14	0.72	2.95	100.00	507
11–15	2.45	23.49	46.24	18.16	4.18	5.47	100.00	365
16–20	2.13	7.61	21.64	55.16	11.52	1.94	100.00	550
>20	2.86	0.84	3.59	30.37	57.48	4.87	100.00	278
N	204	443	419	507	249	83	1,905	
	Smoking Intensity (CPD) in 2012							
CPD in 2010	**1–5**	**6–10**	**11–15**	**16–20**	**>20**	**Quitters**	**Total**	**N**
	In Per Cent							
1–5	47.36	33.76	0.91	2.42	4.19	11.36	100.00	233
6–10	12.83	55.13	16.37	8.85	2.00	4.81	100.00	465
11–15	3.07	25.13	40.80	22.51	3.08	5.40	100.00	432
16–20	0.77	8.26	16.43	55.33	16.19	3.01	100.00	518
>20	0.45	1.49	4.54	21.12	68.94	3.46	100.00	245
N	200	494	375	496	236	92	1,893	
	Smoking Intensity (CPD) in 2014							
CPD in 2012	**1–5**	**6–10**	**11–15**	**16–20**	**>20**	**Quitters**	**Total**	**N**
	In Per Cent							
1–5	48.50	26.39	7.57	9.04	0.49	8.00	100.00	215
6–10	12.85	48.08	22.92	4.29	0.13	11.73	100.00	546
11–15	2.49	22.52	46.92	22.18	2.21	3.67	100.00	399
16–20	1.36	6.43	17.43	53.61	15.01	6.16	100.00	519
>20	1.97	3.76	3.64	31.13	48.12	11.38	100.00	248
N	184	474	424	484	207	154	1,927	

Note: SOEP waves 2002–2014. Balanced Panel. Data weighted by expansion factors supplied in the data set. CPD = Cigarettes per day. Quitters are defined as smokers, who quit smoking during the period of observation and did not start smoking again. Sample size (N) not weighted.

Table C14: Distribution of smokers by smoking intensity (CPD)

	Year									
Number of CPD	**1998***	**2001***	**2002**	**2004**	**2006**	**2008**	**2010**	**2012**	**2014**	**Total**
	Percentage of Smokers									
1–5	14.47	13.63	10.37	12.50	12.42	12.33	14.59	14.31	15.76	13.33
6–10	19.49	19.40	21.21	22.84	24.43	26.63	24.87	27.14	26.22	23.46
11–15	15.67	16.63	16.35	16.57	18.58	18.40	20.26	20.16	20.92	18.08
16–20	32.63	32.60	34.02	31.30	29.54	27.85	26.88	25.51	25.71	29.71
21–25	5.15	6.26	7.06	6.04	5.44	6.61	4.94	5.86	5.00	5.83
>25	12.59	11.49	10.98	10.75	9.59	8.18	8.46	7.02	6.40	9.59
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Percentage of Female Smokers									
1–5	17.65	16.83	13.27	16.33	15.86	15.04	18.87	17.43	19.52	16.70
6–10	25.76	23.41	26.68	27.50	28.85	31.91	30.65	32.05	31.92	28.71
11–15	17.00	19.12	17.51	17.27	19.30	20.17	19.80	21.39	21.12	19.17
16–20	28.92	29.20	31.11	28.79	26.71	23.25	22.51	20.42	19.84	25.73
21–25	3.62	4.50	5.30	4.63	3.50	4.98	3.88	4.37	3.78	4.29
>25	7.05	6.94	6.13	5.48	5.79	4.65	4.28	4.33	3.81	5.40
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Percentage of Male Smokers									
1–5	12.23	11.20	8.08	9.33	9.33	10.00	10.87	11.59	12.45	10.54
6–10	15.08	16.36	16.90	18.99	20.45	22.07	19.85	22.85	21.21	19.12
11–15	14.73	14.74	15.44	15.98	17.93	16.86	20.65	19.08	20.73	17.18
16–20	35.23	35.17	36.32	33.37	32.10	31.81	30.68	29.94	30.87	32.99
21–25	6.23	7.59	8.45	7.20	7.18	8.02	5.87	7.17	6.07	7.11
>25	16.49	14.94	14.81	15.12	13.01	11.23	12.09	9.36	8.67	13.05
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Note: SOEP waves 1998–2014. Unbalanced panel. Data weighted by expansion factors supplied in the data set. CPD = Cigarettes per day. Smoking intensity is defined as the average number of CPD per smoker. For 1998 and 2001, the number of CPD are approximated. No numbers of CPD available for wave 1999.

*Due to the approximation of CPD, average CPD no longer are integers. Alternative groups are >0–5; >5–10; >10–15; >15–20; >20; >0–15; >15; >0–20; >20.

D Smoking Initiation and Cessation

Table D1: Share of ever smokers by birth cohort, educational level and income quartile in 2012

	Birth Cohort								
	1910–29	**1930–39**	**1940–49**	**1950–59**	**1960–69**	**1970–79**	**1980–89**	**1990–94**	**Total**
	Percentage of Ever Smokers in Per Cent								
Educational Level									
Basic Secondary School	33.00	41.64	55.18	70.66	70.08	74.19	72.20	59.72	59.97
Intermediate Secondary School	44.15	41.63	51.50	67.48	65.65	62.37	63.17	41.54	60.63
Maturity Cert. + Tertiary Educ.	49.57	53.03	56.62	57.09	52.38	45.22	43.65	24.94	49.22
Equivalent Income									
1st (Lowest) Quartile	31.76	40.42	53.88	70.51	69.17	70.07	60.10	44.51	57.69
2nd Quartile	34.94	44.04	52.18	65.51	66.83	63.69	60.24	37.51	56.29
3rd Quartile	48.34	44.57	55.54	68.40	62.57	55.10	52.53	28.05	55.98
4th (Highest) Quartile	46.21	53.41	58.63	61.34	57.17	48.06	47.88	30.35	54.34
Total	37.90	44.13	54.77	65.91	62.96	58.26	55.65	36.31	56.08

Note: SOEP wave 2012. Data weighted by expansion factors supplied in the data set. Ever smokers are defined as respondents who smoke or used to smoke on a regular basis. Sample does not include persons still in school and persons with no finished school degree. Due to sample size, persons with a maturity certificate and with a tertiary education are combined.Basic Secondary = Hauptschulabschluss; Intermediate = Realschulabschluss; Maturity Cert. = Abitur; Tertiary Educ. = Uni-/ Fachhochschulabschluss.

Table D2: Smoking histories for eight birth cohorts in 2012

	Smoking Behaviour			Ever Smoker	
	Daily	**Former**	**Never**	**Start Age**	**Quit Age**
	In Per Cent			Mean	
All					
1910–29	6.13	31.78	62.10	20.78	50.67
1930–39	10.11	34.01	55.87	20.19	48.57
1940–49	19.80	34.97	45.23	19.12	44.16
1950–59	34.80	31.11	34.09	17.75	39.35
1960–69	38.25	24.70	37.04	17.17	34.26
1970–79	36.00	22.26	41.74	17.01	30.01
1980–89	39.05	16.60	44.35	15.95	24.32
1990–94	30.69	5.61	63.69	15.55	18.18
Total	30.27	25.82	43.92	17.69	38.53
Women					
1910–29	4.53	17.50	77.97	23.98	54.02
1930–39	7.73	19.91	72.37	22.73	50.22
1940–49	17.81	23.87	58.32	20.79	44.31
1950–59	30.85	26.01	43.14	18.37	38.94
1960–69	36.72	23.06	40.22	17.40	33.39
1970–79	30.64	20.78	48.57	17.33	29.38
1980–89	34.17	18.95	46.87	15.97	24.32
1990–94	25.54	6.60	67.86	15.57	18.15
Total	26.84	21.28	51.88	18.19	36.61
Men					
1910–29	8.34	51.59	40.08	19.15	49.27
1930–39	12.65	49.01	38.34	19.08	47.92
1940–49	21.79	46.08	32.13	18.13	44.09
1950–59	39.09	36.64	24.27	17.27	39.67
1960–69	39.83	26.40	33.76	16.96	35.01
1970–79	41.80	23.86	34.34	16.74	30.58
1980–89	44.18	14.12	41.70	15.93	24.32
1990–94	35.38	4.71	59.91	15.53	18.21
Total	33.87	30.58	35.55	17.31	39.87

Note: SOEP wave 2012. Data weighted by expansion factors supplied in the data set. Ever smokers are defined as respondents who smoke or used to smoke on a regular basis. Former smokers are defined as persons who used to smoke on a regular basis.

E Health and Smoking

Table E1: Comparison of smokers and non-smokers by health indicators in 2014

	Non-Smoker	**Smoker**	**Total**
	In Per Cent		
State of Health			
Very Good	10.12	9.25	9.89
Good	37.83	35.52	37.22
Satisfactory	33.03	33.42	33.13
Poor	15.38	16.82	15.77
Bad	3.63	4.99	3.99
Total	100.00	100.00	100.00
Healthy Diet			
A lot	11.22	5.46	9.72
Some	43.21	30.80	39.98
A little	41.41	50.77	43.85
None	4.16	12.97	6.45
Total	100.00	100.00	100.00
Risk Willingness			
Risk-averse	48.70	35.40	45.16
Medium	43.41	48.21	44.69
Risk-prone	7.89	16.39	10.15
Total	100.00	100.00	100.00

Note: SOEP wave 2014. Data weighted by expansion factors supplied in the data set. State of health measures the respondents own assessment of its current state of health. Healthy diet measures how much attention a person pays to maintaining a healthy diet. Risk willingness measures the willingness to take risks with regard to health.

Table E2: Comparison of heavy smokers and non-heavy smokers by health indicators in 2014

	Non-heavy Smoker	**Heavy Smoker**	**Total**
	In Per cent		
State of Health			
Very Good	9.40	7.55	9.19
Good	36.39	27.35	35.36
Satisfactory	32.78	36.94	33.26
Poor	16.72	19.86	17.07
Bad	4.71	8.29	5.12
Total	100.00	100.00	100.00
Healthy Diet			
A lot	5.51	4.73	5.42
Some	32.91	11.00	30.36
A little	50.38	56.03	51.04
None	11.21	28.24	13.18
Total	100.00	100.00	100.00
Risk Willingness			
Risk-averse	35.26	32.46	34.94
Medium	49.08	43.03	48.39
Risk-prone	15.67	24.51	16.67
Total	100.00	100.00	100.00

Note: SOEP wave 2014. Data weighted by expansion factors supplied in the data set. State of health measures the respondents own assessment of its current state of health. Healthy diet measures how much attention a person pays to maintaining a healthy diet. Risk willingness measures the willingness to take risks with regard to health. Heavy smokers are defined as smokers with a daily cigarette consumption higher than 20 cigarettes.

Table E3: Comparison of consumption groups (in CPD) by health risk willingness in 2014

	Smoking Intensity (CPD) in 2014			
Risk Willingness	**1–10**	**11–20**	**>20**	**Total**
	All (In Per Cent)			
Risk-averse	36.43	34.13	32.46	34.90
Medium	49.25	48.95	43.03	48.40
Risk-prone	14.32	16.92	24.51	16.69
All	100.00	100.00	100.00	100.00
	Women (In Per Cent)			
Risk-averse	41.12	40.80	39.75	40.89
Medium	48.84	46.57	42.25	47.41
Risk-prone	10.04	12.63	18.00	11.70
All	100.00	100.00	100.00	100.00
	Men (In Per Cent)			
Risk-averse	30.16	29.47	29.19	29.66
Medium	49.81	50.61	43.39	49.27
Risk-prone	20.03	19.92	27.43	21.06
All	100.00	100.00	100.00	100.00

Note: SOEP wave 2014. Data weighted by expansion factors supplied in the data set. State of health measures the respondents own assessment of its current state of health. Healthy diet measures how much attention a person pays to maintaining a healthy diet. Risk willingness measures the willingness to take risks with regard to health. CPD = Cigarettes per day.

Table E4: Comparison of quitters and non-quitters by health indicators in 2014

	Non-Quitter	**Quitter**	**Total**
	In Per Cent		
State of Health			
Very Good	7.61	5.14	7.10
Good	33.79	32.05	33.43
Satisfactory	36.74	37.06	36.81
Poor	17.68	18.19	17.79
Bad	4.17	7.55	4.87
Total	100.00	100.00	100.00
Healthy Diet			
A lot	5.43	7.44	5.85
Some	32.83	41.75	34.70
A little	52.18	45.73	50.83
None	9.55	5.08	8.61
Total	100.00	100.00	100.00
Risk Willingness			
Risk-averse	40.41	48.36	42.07
Medium	46.11	44.02	45.67
Risk-prone	13.48	7.62	12.26
Total	100.00	100.00	100.00

Note: SOEP waves 2002, 2004, 2006, 2008, 2010, 2012 and 2014. Balanced Panel with adjustments for younger birth cohorts (see Chapter 2). Quitters are defined as smokers who quit smoking during the period of observation and did not start smoking again. State of health measures the persons own assessment of its current state of health. Healthy diet measures how much attention a person pays to maintaining a healthy diet. Risk willingness measures the willingness to take risks with regard to health.