Predictors of car smoking rules in three EU countries: Findings from the ITC France, Germany, and Netherlands surveys

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Predictors of car smoking rules among smokers in France, Germany and the Netherlands

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Background: As exposure to tobacco smoke pollution (TSP) has been identified as a cause of premature death and disease in non-smokers, and studies have demonstrated that smoking in cars produces high levels of TSP, this study will investigate smokers' rules for smoking in their cars, and predictors of car smoking rules, including potentially modifiable correlates. **Methods:** Data were drawn from nationally representative samples of current smokers from the International Tobacco Control Policy Evaluation Project surveys in France (2007), Germany (2007), and the Netherlands (2008). Smokers in France and Germany were asked about smoking rules in their cars, and smokers in the Netherlands were asked about smoking rules in cars carrying children. **Results:** In France and Germany, 59% and 52% of smokers respectively, allowed smoking in their cars. In the Netherlands, 36% of smokers allowed smoking in cars carrying children. Predictors of allowing smoking in cars included: being a daily vs. non-daily smoker, being younger vs. older age, having no (young) children in the home, being a heavier smoker, and allowing smoking in the home. In the Netherlands, smokers who agreed that TSP is dangerous to non-smokers were less likely to allow smoking in cars carrying children. **Conclusion:** Overall, a sizeable proportion of smokers allowed smoking in their cars across the three countries. Media campaigns with information about the dangers of TSP may increase the adoption of smoke-free cars. These media campaigns could target smokers who are most likely to allow smoking in cars.

Introduction

Tobacco smoke pollution (TSP) killed an estimated 172,300 people in the European region in 2004.[1] TSP has been identified as carcinogenic to humans and a cause of death and disease in non-smokers.[2–4] Childhood exposure to TSP puts children at risk for disease and death, including sudden infant death syndrome, and middle ear and respiratory infections.[3]

Primary sources of TSP exposure include public places with no comprehensive smoke-free rules, and private homes and cars where smoking is allowed. Air quality monitoring studies show that smoking in cars produces dangerous levels of TSP, even if compensatory measures are taken, i.e., opening a window.[5–10] Additionally, a longitudinal study found that exposure to TSP in cars was related to increased incidence of persistent wheeze in 14 year olds.[11] Another study found an association between children's exposure to TSP in cars, and respiratory and allergic symptoms.[12] Several jurisdictions, including states/provinces in Australia and Canada, have now banned smoking in cars carrying children because of children's vulnerability to environmental health hazards (e.g., do not have the same ability as adults to protect themselves from TSP).[13,14]

The 2009 Eurobarometer survey found that of smokers in the European Union (EU), 42% allowed smoking all the time in their car, 23% sometimes, and 35% never.[15] Yet, despite the health harms posed by TSP in cars, few studies have examined the predictors of smoking in cars in Europe, and only one study has done so using a nationally representative sample of smokers (in the UK (United Kingdom)).[15–19]

This study will investigate predictors of smoking in cars among nationally representative samples of smokers from the International Tobacco Control (ITC) Europe Project Surveys in France, Germany, and the Netherlands. The ITC Project (comprised of prospective cohort surveys of representative samples of smokers and non-smokers in 20 countries) is designed to evaluate the psychosocial and behavioural impact of the Framework Convention on Tobacco Control (FCTC).[20,21] Because the ITC survey questions sometimes differ across countries depending on national priorities, the measure of smoking in cars for France and Germany is different than in the Netherlands. Thus, in France and Germany, predictors of car smoking rules will be examined, whereas, in the Netherlands, predictors of smoking rules in cars carrying children will be examined.

The current study is an extension of research from a previous study that examined predictors of smoking in cars with non-smokers among smokers from the ITC Four Country Project in Australia, Canada, the UK and the United States (USA), thus, it will follow similar methods.[19] The current study will examine predictors of smoking in cars, including characteristics of respondents, smoking behaviour (quit intentions and heaviness of smoking index (HSI)), and potentially modifiable correlates that could be addressed by public health policy (knowledge of harms of TSP to non-smokers and rules for smoking in the home). Understanding

what factors are related to smoking in cars may help inform policies to encourage the adoption of smoke-free cars.

Methods

Respondents

Respondents were adult smokers (≥18 years) from France (N = 1,604), Germany (N = 1,361), and the Netherlands (N = 1,187). All data is from Wave 1 of each country's ITC project survey. Survey dates were: France (December 2006–February 2007), Germany (July–November 2007), and the Netherlands (April 2008). Samples were stratified geographically, with the exception of France where the design was a simple random sample. All analyses were weighted on sex and age to ensure that smokers in the surveys were nationally representative of smokers in the general population.

Respondents from France and Germany were selected using random digit dialling. Interviews were conducted using computer assisted telephone interviewing (CATI). In the Netherlands, two different sampling and survey modes were used: (1) a CATI sample (N = 404), and (2) a computer assisted web interviewing (CAWI) sample (N = 1,668). Respondents for the CAWI sample were drawn from a population-based internet panel, TNS NIPObase.[22] For this paper, only the CAWI sample was used because the shorter CATI survey did not include the measure of interest. Further details on methodology may be found elsewhere.[23–26]

Measures

Car smoking rules (Germany and France): Smokers were asked: "What are the rules about smoking in your family car or cars? Would you say . . . smoking is never allowed in any car, smoking is allowed sometimes or in some cars, smoking is allowed in all cars, or do not have a family car." For the main analyses, responses were dichotomised as: smoking is allowed sometimes/in all cars vs. never allowed. Rules for smoking in cars were dichotomised in this way because no level of TSP has been shown to be risk-free.[3] Respondents who did not have a car were excluded (Germany, n = 139; France, n = 121).

Rules for smoking in cars carrying children (Netherlands): "What are the rules about smoking in your family car or cars when there are children in the car? Would you say . . . smoking is never allowed in any car, smoking is allowed sometimes or in some cars, smoking is allowed in all cars, do not have a car, or I never have children in my car." For the main analyses responses were coded as: smoking is allowed sometimes/in all cars vs. never allowed. Respondents who did not have a car or who never had children in the car were excluded (n = 449).

Characteristics of respondents: Characteristics included: sex, age, minority status, education, age of youngest child in the home, and smoking status. See Table 1 for variable categories. Minority status was coded as: France (French language only spoken in the home vs. otherwise), Germany (German nationality vs. otherwise), and the Netherlands (both parents born in the Netherlands vs. otherwise).

Heaviness of Smoking Index: HSI is a composite measure of nicotine dependence, consisting of cigarettes per day (0–10, 11–20, 21–30, or >30), and minutes to first cigarette after waking (<5, 6–30, 31–60, or >60).[27]

Intentions to quit smoking: Respondents were asked if they had plans to quit within the next month, within the next six months, sometime in the future-beyond six months, or no plans to quit. Intentions to quit were dichotomised as plan to quit in the next six months vs. otherwise.

Knowledge and beliefs about TSP: Respondents were asked: "Based on what you know, does smoking cause lung cancer in non-smokers from secondhand smoke?" Response categories were: yes or no. "Don't know" responses were categorized separately. Respondents were also asked whether they strongly agreed, agreed, neither agreed nor disagreed, disagreed, or strongly disagreed with the statement: Cigarette smoke is dangerous to non-smokers. Responses were coded as strongly agree/agree vs. otherwise. Because there were very few "don't know," responses, don't knows were grouped into the latter category.

Rules for smoking in homes: Respondents were asked to describe smoking inside their home: smoking is allowed anywhere inside your home, smoking is allowed in some rooms inside your home, smoking is never allowed inside your home, or smoking is not allowed inside your home except under special circumstances. Responses were coded as smoking is never allowed vs. otherwise.

Statistical analyses

All analyses were conducted with SAS 9.2 using weighted data, except for the characteristics of respondents displayed in Table 1. Respondents who otherwise met selection criteria with missing data were deleted from all analyses (21 in the Netherlands, 10 in France, and 13 Germany). Predictors of allowing smoking in cars in Germany and France, and allowing smoking in cars carrying children in the Netherlands, were tested in separate models for each country. The model used a three stage logistic regression analysis with the dichotomised dependent variable (smoking is allowed sometimes/in all cars vs. never allowed). In the first stage of the model, respondent characteristics were examined. In the second stage, smoking behaviour correlates (HSI and quit intentions) were added, and in the third stage, modifiable correlates (knowledge and beliefs about TSP and rules for smoking in homes) were added. All variables were treated as categorical except for HSI, which was treated as continuous. The three stage model was used so that respondent characteristics could be examined independently of other predictors, and the respondent characteristics and smoking behaviour correlates could be examined independently of modifiable correlates. Omnibus test statistics for overall trend of the categorical variables were examined in the models at each stage.

Car smoking rules in Germany and France were compared by (1) examining differences in car smoking rules on the non-dichotomised car smoking rules variable in an unadjusted analyses using the adjusted Rao-Scott Chi-Square test (Rao-Scott accounts for survey design), and (2) combining the two countries in a single logistic regression model, adding country as a covariate, and controlling for all covariates with the dichotomised dependent variable.

Results

Characteristics of respondents: See Table 1. Some notable differences across the countries include more males and fewer older smokers in the Netherlands sample, a lower percentage of smokers in France with no children in the household, and fewer minority status smokers in Germany (likely because of different definitions of minority status).

Car smoking rules and predictors of rules in France and Germany

Car smoking rules: In France, 41% never allowed smoking in their car, 40% sometimes allowed smoking in their car, and 19% always allowed smoking. In Germany, 48% never allowed smoking in their car, 28% sometimes allowed smoking, and 24% always allowed smoking. Differences in car smoking rules between the two countries were significant, χ^2 (2, $N = 2965$) = 36.99, $p<0.001$.

Characteristics of respondents: See Table 2 for results. In Germany, younger smokers, daily smokers and those who had no children compared to a youngest child 1–5 years, were more likely to allow smoking in their cars. In France, younger smokers, daily smokers, and those who had no children compared to a

Table 1 Characteristics of Respondents by Country[a]

Demographics and Smoking Status	Germany (*N* = 1,361)		France (*N* = 1,604)		Netherlands (*N* = 1,187)	
	n	%	n	%	n	%
Sex						
Female	712	52%	831	52%	548	46%
Male	649	48%	773	48%	639	54%
Age Group*						
18–24	195	14%	202	13%	170	14%
25–39	342	25%	601	37%	456	38%
40–54	563	41%	607	38%	353	30%
55+	261	19%	194	12%	208	18%
Education*						
Low	291	22%	717	45%	395	33%
Moderate	524	39%	579	36%	552	47%
High	546	40%	308	19%	240	20%
Minority Status*						
Majority	1310	96%	1405	88%	1089	92%
Minority	51	4%	199	12%	98	8%
Youngest Child*						
No children in household	890	65%	839	52%	727	61%
Under 1	24	2%	50	3%	41	4%
1–5 years	119	9%	256	16%	155	13%
6–12 years	194	14%	268	17%	144	12%
13–17 years	134	10%	191	12%	120	10%
Smoking Status						
Daily Smoker	1239	91%	1445	90%	1067	90%
Monthly/Weekly Smoker	122	9%	159	10%	120	10%

a: Unweighted Frequencies and Sample Sizes
*denotes significantly different across countries at $p < 0.0001$

youngest child 6–12 years, were more likely to allow smoking in their cars. Overall, there seemed to be a general trend towards smokers with younger children to be less likely to smoke in cars.

Smoking behaviour correlates: See Table 3 for results. In both Germany and France, smokers with no intentions to quit, and more nicotine dependent smokers (higher HSI) were more likely to allow smoking in cars.

Modifiable correlates: See Table 4 for results. In both Germany and France, smokers who did not have a smoke-free home were more likely to allow smoking in cars. Knowledge that TSP causes lung cancer and agreement that TSP is dangerous to non-smokers were not significantly related to car smoking rules.

Differences in car smoking rules (Germany vs. France): In a logistic regression analysis combining Germany and France, with adjustment for covariates listed in Tables 2, 3, and 4 and with country added as a dummy variable, French smokers had 1.48 times higher odds than German smokers of always allowing smoking in their cars (95% CI = 1.20– 1.82), $p < 0.001$.

Rules for smoking in cars carrying children and predictors of rules in the Netherlands

Rules for smoking in cars carrying children (Netherlands): In the Netherlands, 64% of smokers reported smoking was never allowed in cars carrying children, 26% reported smoking was sometimes allowed, and 10% reported smoking was always allowed.

Characteristics of respondents: See Table 2 for results. In the Netherlands, smokers who were 18–24 years old were more likely to allow smoking in cars with children than smokers who were 55 years or older. Smokers with low education were more likely to allow smoking in cars carrying children than smokers with high education, as were daily compared to non-daily smokers.

Smoking behaviour correlates: See Table 3 for results. More nicotine dependent smokers (higher HSI) were more likely to allow smoking in cars.

Modifiable correlates: See Table 4 for results. In the Netherlands, smokers without a smoke-free home, and smokers who did not agree that TSP was dangerous to non-smokers were more likely to allow smoking in cars carrying children. Knowledge that TSP causes lung cancer was not associated with car smoking rules.

Omnibus tests. Examination of the overall omnibus test statistics for categorical variables in all three models (Tables 2, 3, and 4) showed that for all categorical level variables that showed significant subgroup differences, the overall omnibus test for trend was also significant at the $p<0.05$ level.

Discussion

Overall, this study showed that significant proportions of smokers in France (59%), Germany (52%), and the Netherlands (36% in cars carrying children) allow smoking in their cars.

In France and Germany, where predictors of car smoking rules were examined, smokers in France were more likely to allow smoking in cars than smokers in Germany. This is consistent with the 2009 Eurobarometer that found that smokers from Germany were less likely to allow smoking in cars.[15] Data on the prevalence of smoke-free homes also shows that a higher percentage of smokers in Germany (30%) never allow smoking in their homes compared to France (23%).[28] Reasons for country differences are uncertain, smokers may avoid smoking in their cars because of health concerns, cleanliness, to preserve car value, and/or to minimise distractions while driving.[29,30]

Overall, predictors of smoking in cars were similar across France and Germany. Respondent characteristics that predicted smoking in cars included: younger age, daily smoking, and older/no children in the home. Younger smokers may be more likely to allow smoking in their cars if they spend more time with friends compared to family/children. The trend towards smokers with (younger) children being less likely to smoke in cars provides some evidence that smokers are aware of the serious health effects of TSP on children. Previous studies have indeed found that having younger children is related to smoke-free homes/preventing children's exposure to TSP.[31,32] Heavier smokers and those with no intentions to quit were more likely to allow smoking in the car, probably because it is more difficult for them to control

Table 2 Characteristics of respondents and cars smoking rules[a,b]

Parameter	Germany-Rules for Smoking in Cars (*N* = 1,361)					France-Rules for Smoking in Cars (*N* = 1,604)					Netherlands-Rules for Smoking in Cars Carrying Children (*N* = 1,187)				
	OR[c]	95% LCI[d]	95% UCI[d]	% Allow Smoking	*p*-value	OR	95% LCI	95% UCI	% Allow Smoking	*p*-value	OR	95% LCI	95% UCI	% Allow Smoking	*p*-value
Sex															
Female	1.00			50%	ref	1.00			58%	ref	1.00			35%	ref
Male	1.23	0.95	1.59	54%	0.118	1.03	0.82	1.31	59%	0.776	1.03	0.78	1.36	37%	0.853
Age Group															
18–24	1.00			72%	ref	1.00			72%	ref	1.00			39%	ref
25–39	0.46	0.29	0.74	52%	0.001	0.73	0.49	1.11	62%	0.142	0.88	0.57	1.35	36%	0.551
40–54	0.36	0.23	0.55	51%	<.0001	0.53	0.35	0.79	56%	0.002	0.79	0.52	1.20	40%	0.268
55+	0.22	0.14	0.36	41%	<.0001	0.25	0.15	0.40	41%	<.0001	0.51	0.31	0.82	30%	0.006
Education															
Low	1.00			48%		1.00			58%	ref	1.00			42%	ref
Moderate	1.11	0.79	1.57	53%	0.553	1.09	0.84	1.42	61%	0.518	0.74	0.54	1.01	34%	0.054
High	1.21	0.86	1.71	54%	0.279	1.09	0.79	1.51	56%	0.610	0.60	0.39	0.91	27%	0.017
Minority Status															
Majority	1.00			52%	ref	1.00			59%	ref	1.00			36%	ref
Minority	0.99	0.50	1.95	57%	0.981	1.11	0.77	1.60	60%	0.586	1.07	0.66	1.73	37%	0.784
Youngest Child															
No children	1.00			55%	ref	1.00			60%	ref	1.00			35%	ref
under 1	0.51	0.20	1.29	46%	0.153	0.52	0.27	1.01	49%	0.052	0.66	0.29	1.49	32%	0.319
1–5 years	0.47	0.29	0.77	39%	0.002	0.94	0.66	1.34	65%	0.739	0.64	0.39	1.05	29%	0.075
6–12 years	0.75	0.50	1.11	48%	0.152	0.56	0.40	0.78	50%	0.001	1.22	0.79	1.86	46%	0.371
13–17 years	0.94	0.61	1.45	55%	0.784	0.93	0.63	1.37	61%	0.695	1.01	0.63	1.63	39%	0.976
Smoking Status															
Weekly/Monthly	1.00			24%	ref	1.00			34%	ref	1.00			12%	ref
Daily Smoker	4.48	2.59	7.75	55%	<.0001	3.27	2.20	4.86	61%	<.0001	4.46	2.37	8.38	38%	<.0001

a: Weighted analyses and percentages, sample size is not weighted
b: Controlling for all covariates in Table (Table 2)
c: OR = Odds Ratio
d: LCI = Lower Confidence Interval, UCI = Upper Confidence Interval

Table 3 Smoking behaviour correlates of car smoking rules[a,b]

Parameter	Germany-Rules for Smoking in Cars (*N* = 1,361)					France-Rules for Smoking in Cars (*N* = 1,604)					Netherlands-Rules for Smoking in Cars Carrying Children (*N* = 1,187)				
	OR[c]	95% LCI[d]	95% UCI	% Allow Smoking	*p*-value	OR	95% LCI	95% UCI	% Allow Smoking	*p*-value	OR	95% LCI	95% UCI	% Allow Smoking	*p*-value
Quit Intentions															
Intention to Quit	1.00			46%	ref	1.00			53%	ref	1.00			33%	ref
No Intention to Quit	1.37	1.00	1.87	55%	0.047	1.49	1.17	1.90	62%	0.001	0.98	0.69	1.40	37%	0.929
HSI[e]	1.51	1.36	1.67		<.0001	1.51	1.37	1.67		<.0001	1.32	1.19	1.46		<.0001
0–low				34%					40%					16%	
1				44%					56%					37%	
2				44%					70%					33%	
3				68%					69%					39%	
4				76%					78%					46%	
5				74%					75%					53%	
6–high				69%					65%					100%	

a: Weighted analyses and percentages, sample size is not weighted
b: Controlling for all covariates in Tables 2 and 3
c: OR = Odds Ratio
d: LCI = Lower Confidence Interval, UCI = Upper Confidence Interval
e: Because HSI is a continuous variable, the OR refers to a per unit increase.

when they smoke. Previous studies have found similar relations between smoking behaviour and smoking rules in homes and cars.[19,31] Additional analyses not included in the results section tested for interactions of the predictors and found none were significant (i.e. differences in predictors by gender, education level, children in household/youngest child, and HSI).

The only modifiable correlate that predicted car smoking rules was smoking rules in the home. Interestingly, the prevalence of smoke-free homes in France and Germany is lower than the prevalence of smoke-free cars, suggesting that it is easier for smokers to implement a smoke-free car policy.[28]

In the Netherlands, 36% of smokers reported that smoking in cars carrying children is always allowed. Predictors of allowing smoking in cars carrying children in the Netherlands were generally the same as predictors of car smoking rules in France and in Germany. Unlike France and Germany, smokers with lower education in the Netherlands were more likely to allow smoking in cars. A previous study of German smokers also found

Table 4 Potentially modifiable correlates of car smoking rules[a,b]

Parameter	Germany-Rules for Smoking in Cars (*N* = 1,361)					France-Rules for Smoking in Cars (*N* = 1,604)					Netherlands-Rules for Smoking in Cars Carrying Children (*N* = 1,187)				
	OR[c]	95% LCI[d]	95% UCI	% Allow Smoking	*p*-value	OR	95% LCI	95% UCI	% Allow Smoking	*p*-value	OR	95% LCI	95% UCI	% Allow Smoking	*p*-value
Agree TSP dangerous to non-smokers															
No	1.00			59%	ref	1.00			63%	ref	1.00			44%	ref
Yes	1.18	0.72	1.92	52%	0.518	0.75	0.36	1.57	59%	0.446	0.63	0.46	0.86	31%	0.003
Know TSP causes Lung Cancer															
No	1.00			61%	ref	1.00			54%	ref	1.00			42%	ref
Yes	0.78	0.52	1.19	51%	0.255	1.35	0.67	2.72	59%	0.405	0.98	0.67	1.41	34%	0.891
Don't know	0.85	0.43	1.69	54%	0.642	1.81	0.44	7.46	68%	0.412	0.71	0.41	1.26	36%	0.244
Rules for Smoking in the Home															
Never Allowed	1.00			30%	ref	1.00			45%	ref	1.00			15%	ref
Allow everywhere/exceptions	3.48	2.54	4.76	63%	<.0001	2.20	1.64	2.95	63%	<.0001	2.94	1.88	4.59	40%	<.0001

a: Weighted analyses and percentages, sample size is not weighted
b: Controlling for all covariates in Tables 2, 3, and 4
c: OR = Odds Ratio
d: LCI = Lower Confidence Interval, UCI = Upper Confidence Interval

childhood exposure to TSP in cars was associated with low socioeconomic status.[16] Surprisingly, having younger children did not significantly predict allowing smoking in cars in the Netherlands. Similar to France and Germany, smokers in the Netherlands with smoke-free homes were less likely to allow smoking in cars. However, unlike France and Germany, smokers in the Netherlands who did not agree that TSP was dangerous to non-smokers were more likely to allow smoking in cars carrying children. This different result in France and Germany may be due to the survey question which only asked about car smoking rules in general, and not about rules in cars carrying children. Indeed, a relation between allowing smoking in cars with non-smokers and knowledge of the health harms of TSP was found in the previous study that examined smoking in cars with non-smokers in Australia, Canada, the UK, and the USA.[19]

Limitations and strengths

Some limitations of this study should be acknowledged. Because cross–sectional data was used, conclusions can only be made about associations between the predictor variables and car smoking rules. The measure for Germany and France is also limited because it asked about car smoking rules in general, and not in the presence of non-smokers, thus it is difficult to know how rules vary when non-smoking occupants are present or when smokers are alone. An additional limitation is that this study concentrated on individual level predictors of car smoking rules, whereas car smoking rules may also be related to household factors. The survey mode in the Netherlands (Internet) was also different from Germany and France (telephone). Key strengths of this study include the use of nationally representative samples, and that the examination of predictors of allowing smoking in cars that could be used to inform policy in adjusted analyses.

Implications

Because smoke-free homes were associated with smoke-free cars, policies associated with increases in smoke-free homes, such as the introduction of comprehensive smoke-free laws, may promote smoke-free cars.[31,33,34] However, a recent review on the effects of comprehensive smoke-free laws found no effects of the implementation of smoke-free laws on exposure to TSP in cars.[35] Still, there does seem to be at least an association between smoking in cars and comprehensive smoke-free policies. For example, the previous study of smoking in cars with non-smokers across four countries found that reports of smoking in cars were lowest in Australia (29%) where the history of smoke-free laws is longest and highest in USA (44%) where the history is shorter.[19] Another study of smokers in the USA showed that smokers who lived in states with lower smoking prevalence rates were more likely to have smoke-free homes, suggesting that implementation of smoking bans in private spaces may increase as smoking becomes less 'normal.'[36] Thus, these differences across countries could be due to both long–term denormalisation of smoking, and smoking in cars. A recent repeat cross–sectional study from England also showed that smoking in homes and cars decreased after the implementation of smoke-free legislation.[37]

The relation found in this study between agreeing that TSP is dangerous to non-smokers and never allowing smoking in cars with children in the Netherlands, suggests that polices to inform smokers about the harms of TSP could increase the adoption of smoke-free cars. Media campaigns could target smokers who are more likely to smoke in their cars (i.e., younger smokers, smokers with low education in the Netherlands). Previous research has indeed shown that among Dutch smokers with low education, only 1% think very often about the harm of smoking to others.[38] These types of initiatives may be particularly important for the Netherlands, where only 61% of smokers agree that TSP is dangerous to non-smokers.[39] Although, no significant relation was found between car smoking rules and knowledge of the dangers of TSP in France and Germany, media campaigns could still be useful; for instance, they could prime existing beliefs about the dangers of TSP, and make smokers aware that an implication of their beliefs is that they should not smoke in cars carrying non-smokers, and that opening a window cannot mitigate the dangers of exposure.[40]

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