



Smoking ban policies and their influence on smoking behaviors among current California smokers: A population-based study

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ABSTRACT

Objective. To assess whether smoking ban policies are associated with smoking reduction and quit attempts among California smokers.

Methods. Data were examined for 1718 current smokers from follow-up telephone interviews conducted in 2011 of persons previously identified as smokers in a representative sample of the adult population of California. Population weighted logistic regressions controlling for demographic and other variables were used to evaluate the association between smoking ban policies (home, work, and town) and changes in tobacco use (past year quit attempt or reduction in smoking rate).

Results. Living in a home with a total ban was significantly associated with smoking reduction (adjusted odds ratio, AOR: 2.4, 95% CI: 1.4–4.2) and making a quit attempt (AOR: 2.3, 95% CI: 1.3–3.9) compared to living in a home with no home ban. Self-reported perception of an outdoor ban in one's city/town was associated with smoking reduction (AOR: 1.7, 95% CI: 1.02–2.7) and making a quit attempt (AOR: 1.8, 95% CI: 1.05–2.9).

Conclusion. These results indicate that smoking bans not only protect nonsmokers from the harms of second-hand smoke, but are also associated with smoking reduction and cessation.

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Introduction

The health consequences of smoking and second-hand smoke (SHS) have been well documented and summarized (CDC Fact Sheets, 2011; CDC MMWR, 2011; USDHHS, 2007). Cigarettes are responsible for approximately one in every five deaths each year in the U.S. (USDHHS, 2010). Therefore, increasing the rate of successful smoking cessation has become a key strategy to improve the health of the population (Biener et al., 2010; Levy et al., 2000).

The immediate social environment of the smoker is presumed to play an important role in influencing smoking cessation (Biener et al., 2010). Considerable evidence suggests that having a smoke-free home may be associated with successful quitting and reduced daily consumption levels among adult smokers (Messer et al., 2008; Mills et al., 2009). Having children in the home (Borland et al., 2006) and the presence of workplace smoking restrictions (Farkas et al., 1999; Longo et al., 2001) have also been associated with increased cessation and decreased consumption in continuing smokers. Public smoking bans and home smoking bans are not isolated from each other. Borland et al. (2006)

found evidence that public policies that limit smoking may stimulate adoption of home bans. Total smoking ban (either public or home) promoted stronger and more consistent effects in smoking reduction and cessation than a partial smoking ban (Borland et al., 2006; Naiman et al., 2011; Pizacani et al., 2004).

In the U.S., the number of states with comprehensive smoke-free laws in effect increased from 0 to 26 states from the end of 2000 to the end of 2010 (CDC MMWR, 2011). California has been referred to as "America's Non-Smoking Section" because in 1994 it became the first state in the country to ban smoking in nearly every workplace and effectively banned smoking in indoor public spaces (California Environmental Protection Agency, 2011). While California's law is one of the most restrictive in the nation, it does have exceptions that allow smoking in designated areas and therefore there is still exposure to SHS in public places (CDC Tobacco Control State Highlights, 2010). In California more smokers attempt to quit now than in the past, and do so more than smokers in other states (Al-Delaimy et al., 2007; Messer et al., 2007; Tang et al., 2010). This change has been attributed to a shift towards anti-smoking social norms (Roeseler and Burns, 2010). The current analyses use a population-based sample to assess whether home smoking bans, workplace bans, and perceptions of outdoor and city smoking bans are associated with quit attempt rates and reduced

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cigarette consumption by smokers. We hypothesize that smoking bans, perceived or actual, are related to higher quit attempt rates and reduced cigarette consumption in a representative sample of California smokers.

Methods

The data used in the present study are from the 2011 California longitudinal smokers survey (CLSS). The CLSS is a follow-up survey of smokers who participated in the 2009 California health interview survey (CHIS), a population-based random sample (random digit dial telephone interview) of California residents. CHIS 2009 data collection spanned from December, 2009 through May, 2010 (CHIS, 2011). The CLSS follow-up telephone interview began in July, 2011 and concluded in December, 2011 (Wivagg, 2012). Only persons who were identified as smokers in CHIS 2009, who agreed to future contact, and who spoke English or Spanish were approached for follow-up by the CLSS. A total of 5530 smokers were identified in CHIS 2009, and 4837 agreed to follow-up, of whom 4717 were English/Spanish speakers. In total, 1961 of the eligible 2009 participants completed the follow-up survey (Wivagg and Norman, 2012): 1369 current daily smokers, 349 current non-daily smokers and 243 former smokers in 2011 CLSS. The 1718 current smokers are the subjects of this study. CLSS respondents were weighted to the age, gender, geographic place of residence, and ethnicity of the population of adult California smokers as previously described (Norman, 2012). Table 1 shows the demographic distribution of our study population.

Outcome variables

We chose two smoking behavior variables as outcomes in relation to smoking policies. Reduction in the number of cigarettes smoked and quit attempts represent important early-stage quitting behaviors among smokers. The recall period for both variables was one year.

Smoking Reduction: Self-reported smoking reduction was determined by response to the question: "Compared to last year at this time, would you say you're now smoking ..." The answer options were "The same as you were before", "More than you were before", or "Less than you were before". The first two choices were collapsed to create a dichotomous outcome in the analysis.

Quit Attempts: Self-reported quit attempts were assessed by response to the question: "During the past 12 months, have you quit smoking intentionally for one day or longer?"

Independent variables

The independent variables used in statistical modeling were grouped into 2 categories: demographic variables and smoking ban policies.

Demographic variables included: (1) Gender; (2) Age category (18–24 years 25–44 years 45–64 years and 65+ years); (3) Ethnicity (Hispanic, Non-Hispanic White and all others); (4) household annual income (<\$50,000 and ≥\$50,000); (5) Live with partner; (6) Education (High School or Less and Some College or More); and (7) Living with children younger than 18 years.

Table 1
Demographic distribution of California smokers ($N^a = 1718$).

Characteristics		Weighted % (± 1.96 × SE)	N ^a
Age (years)	18–24	10.3 (±4.2)	40
	25–44	43.2 (±6.0)	243
	45–64	36.8 (±3.6)	915
	65+	9.7 (±1.6)	520
Gender	1 = Male	62.4 (±3.1)	784
	2 = Female	37.6 (±3.1)	934
Race	Hispanic	29.4 (±3.5)	199
	Non-Hispanic white	48.4 (±3.6)	1273
Income	All others	22.2 (±3.6)	246
	<\$50,000	53.6 (±5.4)	896
Live with partner	> = \$50,000	46.4 (±5.4)	648
	Yes	55.3 (±5.9)	816
Education	No	44.7 (±5.9)	894
	High School or Less	40.6 (±5.0)	578
Live with children under 18 year	Some college or more	59.4 (±5.0)	1140
	Yes	39.4 (±6.0)	332
	No	60.6 (±6.0)	1386

^a Number of samples before weighting.

To assess home smoking bans, the CLSS questionnaire asked: "What are the current rules or restrictions about smoking inside your home?" The variable was coded in 3 levels: total home ban, partial home ban and no home ban. To assess indoor work smoking bans, interviewees were asked whether their workplace was completely smoke-free. Only respondents who reported working indoors were considered in analyses of this item. Perceived city/community smoking ban policies were assessed by four questions: "As far as you know, what are the rules about smoking in the city or town where you live: I. Is there a complete ban on smoking outside? II. Is smoking allowed in outdoor restaurant dining areas? III. Is smoking allowed in parks and playgrounds? IV. Is smoking allowed on beaches?" Responses were combined to derive a 2-level variable: complete or partial ban versus no ban. A YES to item I or NO to any other item was defined as "complete/partial ban"; a NO to item I and YES to all other items was defined as "no ban". In addition, home smoking ban and perceived city/community ban were combined to create a 3-level variable reflecting the extent of bans: home ban and perceived city ban, home ban or perceived city ban and no ban (work bans were excluded because these did not apply to all participants).

Statistical analysis

All parameter estimates reported were weighted to be representative of the population of adult California smokers. Standard errors (SE) were calculated by the paired unit jackknife method (JK2) using 80 jackknife samples (Norman, 2012). Descriptive statistics for both the outcome variables and the independent variables are reported with jackknife 95% confidence intervals (calculated as $\pm 1.96 \times SE$). Weighted logistic regression was performed for the 2 primary outcomes with demographic and smoking ban policy variables added in the model. Post-hoc analyses of associations between the smoking ban policies and the outcomes stratified by demographic variables were carried out to further evaluate the key demographic component that may modify these associations. Crude odds ratios (OR), adjusted odds ratios (AOR) and their 95% Confidence Intervals (CI) calculated from the weighted logistic regression model parameter estimates were summarized and compared. All parameter estimates and confidence intervals were calculated using survey statistics procedures in SAS version 9.3 (SAS Institute Inc., 2011).

Results

Table 2 shows the population-weighted estimates of home, workplace and perceived city/town smoking ban exposure of California smokers in 2011. A total of $68.9 \pm 4.9\%$ of the smokers lived in a home with a total home ban, $16.5 \pm 4.6\%$ a partial home ban and $14.5 \pm 3.3\%$ with no home ban. A total of $48.2 \pm 4.9\%$ of smokers worked indoors, of whom $94.4 \pm 3.7\%$ work in a completely smoke-free environment. When asked about perceived complete or partial outdoor smoking bans in their town/city, $75.3 \pm 4.3\%$ of the smokers reported such a ban.

The estimated distribution of smoking reduction and quit attempts among smokers by demographic and smoking ban policies is shown in Table 3. Overall, $44.0 \pm 5.0\%$ of smokers reported that they smoked

Table 2
Frequency of reported home, work or city smoking ban policies among California smokers ($N^a = 1718$).

Ban policies		Weighted % ($\pm 1.96 \times SE$)	N ^a
Home ban	Total home ban	68.9 (±4.9)	912
	Partial home ban	16.5 (±4.6)	363
	No home ban	14.5 (±3.3)	437
Work indoor ^b	Yes	48.2 (±4.9)	555
	No	51.8 (±4.9)	1152
Work ban ^c	Yes	94.4 (±3.7)	525
	No	5.6 (±3.7)	30
Perceived city ban	Complete/partial ban	75.3 (±4.3)	1119
	No ban	24.7 (±4.3)	557

^a Number of samples before weighting.

^b Work Indoor was defined as: currently work for money in an indoor setting outside of the home.

^c Indoor workers only.

Table 3

Frequency of smoking reduction and quit attempt among smokers by demographic variables and actual or perceived smoking ban policies in the home workplace and community.

Characteristics		Smoke less compared to one year ago Weighted % ($\pm 1.96 \times SE$)	Have quit smoking ≥ 1 day during past 12 months Weighted % ($\pm 1.96 \times SE$)
Overall		44.0 (± 5.0)	60.7 (± 6.2)
Age (years)	18–24 (ref)	51.7 (± 20.7)	74.0 (± 21.7)
	25–44	36.8 (± 9.4)	65.4 (± 10.2)
	45–64	46.8 (± 7.4)	55.4 (± 8.5)
	65+	56.9 (± 9.5)	45.7 (± 10.0) ^a
Gender	1 = Male (ref)	41.5 (± 6.4)	61.2 (± 9.1)
	2 = Female	48.1 (± 8.3)	59.7 (± 7.8)
Race	Hispanic	48.7 (± 12.1)	70.1 (± 10.6) ^a
	Non-Hispanic white (ref)	38.4 (± 6.3)	53.7 (± 6.3)
	All others	49.8 (± 12.4)	63.5 (± 14.3)
Income	<\$50,000 (ref)	46.2 (± 7.9)	62.3 (± 7.7)
	>= \$50,000	41.7 (± 8.5)	59.2 (± 9.2)
Live with partner	Yes	43.3 (± 6.1)	58.5 (± 6.7)
	No (ref)	44.8 (± 9.2)	62.8 (± 8.5)
Education	High school or less (ref)	44.4 (± 6.7)	60.9 (± 9.0)
	Some college or more	43.8 (± 7.3)	60.5 (± 8.3)
Live with children under 18 year	Yes (ref)	44.8 (± 8.9)	68.2 (± 9.3)
	No	43.5 (± 6.2)	55.9 (± 7.3) ^a
Home ban	Total home ban	46.7 (± 6.6)	66.5 (± 7.2) ^a
	Partial home ban	41.0 (± 11.3)	49.2 (± 12.2)
	No home ban (ref)	35.0 (± 9.2)	46.8 (± 8.8)
Work ban ^b	Yes	39.0 (± 9.1)	61.1 (± 10.2)
	No (ref)	20.5 (± 20.2)	44.2 (± 31.1)
Perceived city ban	Complete/partial ban	46.7 (± 6.1) ^a	64.4 (± 7.1) ^a
	No ban (ref)	35.0 (± 7.6)	49.4 (± 9.0)

^a Univariate logistic regression (weighted) showed $p < 0.05$ comparing to reference category; ref = Referent category in the logistic regression.

^b Indoor workers only.

less compared to one year ago, and $60.7 \pm 6.2\%$ of smokers reported that they quit smoking intentionally for one day or longer during the past 12 months. In population weighted univariate logistic regression analyses (Table 4), smokers reporting a complete/partial city smoking ban had a significantly higher rate of smoking reduction compared to those reporting no city smoking ban (OR: 1.6, 95%CI: 1.1–2.4). A total home smoking ban was associated with significantly higher quit attempts than not having any ban (OR: 2.3, 95%CI: 1.4–3.6). Smokers who reported a complete/partial city smoking ban had a significantly higher rate of quit attempts compared to smokers not reporting such bans (OR: 1.9, 95%CI: 1.2–2.9).

In multiple logistic regression analyses (Table 4), total home ban was significantly associated with both smoking reduction (AOR 2.4, 95% CI: 1.4–4.2) and quit attempts (AOR 2.3, 95% CI: 1.3–3.9) after controlling for covariates. In contrast, persons living in a home with a partial ban did not differ significantly from persons living in a home with no ban for either outcome. Odds of reduction in cigarette consumption was 1.7 times (95% CI: 1.02–2.7) higher and the odds of quit attempt was 1.8 times (95% CI: 1.05–2.9) higher among smokers reporting complete/partial city bans versus smokers not reporting such a ban. Indoor workplace smoke-free status was not significantly associated with either outcome in the multiple logistic regressions, although the direction

Table 4

OR and AOR (95% CIs) from weighted logistic regressions among smokers.

Outcomes	Ban policies	OR ^a (95% CI)	AOR ^b (95% CI)
Smoke less compared to one year ago	Home ban	1.6 (0.99–2.7)	2.4 (1.4–4.2)
	Partial home ban	1.3 (0.7–2.4)	1.4 (0.7–3.0)
	No home ban (ref)	1.0	1.0
	Work indoor ^c	0.6 (0.4–0.99)	0.2 (0.05–1.0)
	Yes	1.0	1.0
	No (ref)	1.0	1.0
	Work ban	2.5 (0.6–9.5)	2.7 (0.6–12.1)
	Yes ^d	1.0	1.0
	No (ref)	1.0	1.0
	Perceived city ban	1.6 (1.1–2.4)	1.7 (1.02–2.7)
	Complete/partial ban	1.0	1.0
	No ban (ref)	1.0	1.0
Have quit smoking ≥ 1 days during past 12 months	Home ban	2.3 (1.4–3.6)	2.3 (1.3–3.9)
	Partial home ban	1.1 (0.6–2.0)	1.0 (0.5–2.1)
	No home ban (ref)	1.0	1.0
	Work indoor ^c	0.97 (0.6–1.6)	0.4 (0.1–1.6)
	Yes	1.0	1.0
	No (ref)	1.0	1.0
	Work ban	2.0 (0.6–6.7)	1.9 (0.4–8.4)
	Yes ^d	1.0	1.0
	No (ref)	1.0	1.0
	Perceived city ban	1.9 (1.2–2.9)	1.8 (1.05–2.9)
	Complete/partial ban	1.0	1.0
	No ban (ref)	1.0	1.0

^a Univariate logistic regression.

^b Multiple logistic regression with all the demographic and ban police variables in the model.

^c Work indoor was defined as: currently work for money in an indoor setting outside of the home.

^d Indoor workers with a workplace ban relative to indoor workers with no workplace ban.

of association was consistent with a positive effect: the AOR for smoking reduction was 2.7 (95% CI: 0.6–12.1) and for making a quit attempt was 1.9 (95% CI: 0.4–8.4).

When examining the extent of bans, identifying both home and city bans was significantly associated with the smoking reduction (AOR: 3.8, 95%CI: 1.6–9.0) and quit attempts (AOR: 4.1, 95%CI: 1.3–13.0) than those reporting no bans. Reporting either a home or city ban was not significantly associated with the outcomes.

The association between total home ban and smoking reduction was not significant in univariate regression and became significant in multiple regression (Table 4). Hence, the association was stratified by all 7 demographic variables. Weighted multiple logistic regressions in different strata showed the association between total home ban and smoking reduction was stronger for those older than 65 years compared to the younger smokers; the association between total home ban and smoking reduction was stronger in female than in male. Furthermore, in relation to quit attempt, two significant interactions of perceived city ban with gender as well as home ban with living with children were found. The stratifications on both demographic variables were performed: positive relationship between perceived city bans and quit attempts was only observed in males, not in females; positive association of total home bans and quit attempts was only for individuals living without children in the home, not for individuals living with children (Table 5).

Exploratory analyses were carried out to assess whether living alone or living with others moderated the relationship between having a

home smoking ban and smoking outcomes. No significant interactions were found, suggesting that home smoking bans are similarly related with outcomes for either living situation.

Discussion

The primary goal of the current analysis was to evaluate in a representative sample of California smokers the relationship between cigarette smoking ban policies and quitting behaviors. We found that living in a home with a total (but not partial) smoking ban, was associated with reducing the amount of cigarettes smoked and with an increased likelihood of making a quit attempt. Results also suggest that California smokers who self-reported living in a city with a smoking ban had increased odds of both smoking reduction and making quit attempts compared to those who did not. In addition, having both home and city bans was associated with increased odds of both outcomes.

The effect of smoking bans on cigarette consumption and quit attempts has been previously reported (Borland et al., 1990; Farkas et al., 1999; Messer et al., 2008; Mills et al., 2009; Naiman et al., 2011; Pizacani et al., 2004). Smoking bans also encouraged smokers to adapt smoking behaviors and attitudes (e.g., attempting or intending to quit, etc.) that increased their chances of future successful cessation (Gilpin et al., 1999). The finding from our study of a significant association with total home bans but not with partial bans is consistent with

Table 5

OR and AOR (95% CIs) from weighted logistic regressions assessing association between bans and two outcomes stratified by important demographic variables among smokers.

Outcomes	Demographic strata	Ban policies ^a		OR (95% CI) ^b	AOR (95% CI) ^c	
Smoke less compared to one year ago	Age	≥65 years	Home ban	Total home ban	3.8 (1.6–8.9)	
			Partial home ban	2.4 (0.98–5.9)	2.5 (0.8–7.6)	
			No home ban (ref)	1.0	1.0	
		<65 years	Perceived city ban	Complete/partial ban	3.0 (1.02–8.6)	
			No ban (ref)	1.0	1.0	
			Home ban	Total home ban	1.6 (0.9–2.8)	
	Gender		Partial home ban	1.2 (0.6–2.6)	1.3 (0.6–2.9)	
			No home ban (ref)	1.0	1.0	
			Perceived city ban	Complete/partial ban	1.5 (0.97–24)	
			No ban (ref)	1.0	1.0	
	Male	Home ban	Total home ban	1.4 (0.7–2.8)		
		Partial home ban	1.4 (0.5–3.6)	1.8 (0.5–6.4)		
		No home ban (ref)	1.0	1.0		
Have quit smoking ≥ 1 day during past 12 months	Gender	Female	Home ban	Complete/partial ban	2.1 (1.2–3.7)	
			No ban (ref)	1.0	1.0	
			Total home ban	2.1 (1.1–4.0)	3.0 (1.2–7.5)	
		Male	Partial home ban	1.2 (0.5–2.7)	1.1 (0.5–2.5)	
			No home ban (ref)	1.0	1.0	
			Perceived city ban	Complete/partial ban	1.1 (0.5–2.3)	
	Live with children under 18 year		No ban (ref)	1.0	1.0	
	Yes	Home ban	Total home ban	2.4 (1.2–4.6)		
		Partial home ban	1.1 (0.4–2.8)	1.1 (0.4–3.0)		
		No home ban (ref)	1.0	1.0		
	No	Perceived city ban	Complete/partial ban	2.6 (1.5–4.6)		
		No ban (ref)	1.0	1.0		
		Home ban	Total home ban	2.1 (1.1–3.8)		
		Partial home ban	1.1 (0.5–2.1)	0.8 (0.3–1.9)		
		No home ban (ref)	1.0	1.0		
		Perceived city ban	Complete/partial ban	1.0 (0.5–2.1)	0.8 (0.3–1.8)	
		No ban (ref)	1.0	1.0		
	Yes	Home ban	Total home ban	0.5 (0.2–1.9)		
		Partial home ban	0.4 (0.07–2.7)	0.5 (0.04–5.9)		
		No home ban (ref)	1.0	1.0		
	No	Perceived city ban	Complete/partial ban	1.3 (0.5–3.6)		
		No ban (ref)	1.0	1.0		
		Home ban	Total home ban	3.2 (1.8–5.5)		
		Partial home ban	1.4 (0.7–2.6)	1.0 (0.5–2.2)		
		No home ban (ref)	1.0	1.0		
		Perceived city ban	Complete/partial ban	1.9 (1.1–3.3)		
		No ban (ref)	1.0	1.0		

^a Work Ban was not included in the subgroup analyses due to extremely small sample size.

^b Univariate logistic regression.

^c Multiple logistic regression with all other demographic variables and the two ban police variables in th.

previous population-based studies that found only full home bans worked effectively while partial bans do not (Naiman et al., 2011; Pizacani et al., 2004). This has important policy and behavioral implications indicating the value of discouraging partial bans and focusing on total bans as an effective policy for prevention of exposure and encouraging quitting. Given this is a representative sample of California smokers weighted to the California population, our results further support the attributed decline in smoking prevalence to the California Tobacco Control Program that focused on smoking bans and social norms (Roeseler and Burns, 2010).

Our findings regarding smokers' perceived city smoking bans and behavior are supported by a population based longitudinal study of demographic social-normative and policy predictors of quit attempts and cessation conducted in Massachusetts (Biener et al., 2010). That study found that perceptions of strong antismoking norms (measured by questions about perceived smoking prevalence among adults and adolescent, and one question about approval of restaurant smoking) in one's town predicted both quit attempts and cessation. To our knowledge, our study is the first examination of the associations of perceived city/town smoking bans at multiple outdoor locations with quitting behaviors. Biener et al. (2010) also reported a significant relation between workplace smoking ban policy and quit attempt rates. However, this effect was not found in the present study, which could be because less than half of participants reported working in an indoor workplace, and of those indoor workplaces, the vast majority were smoke free.

We found that total home ban may be more effective in reducing smoking among elders (≥ 65 years old) and females, and perceived city bans were significantly associated with quit attempts in males but not females. It may be that males are more responsive to perceived city bans than females, however further information is required to address this issue. Similarly, total home ban was significantly associated with quit attempts for those not living with children, but not those in households with children. This finding may reflect that the goal of bans differs for households with and without children. For households with children, bans may be implemented primarily to reduce SHS exposure, while for those without children it may reflect a desire to encourage cessation. Future work is needed to further investigate the mechanisms underlying these observed differences. On the other hand, neither race nor income significantly modified the relations between a total home ban and smoking reduction or a quit attempt in the current study.

There are some limitations in the current study. Only about 50% of the original sample who were identified as smokers participated in the follow-up. All parameter estimates reported were weighted to the population of adult smokers using the design variables (Norman, 2012), which may ameliorate non-response bias to a point. However, we acknowledge that the potential for non-response bias typical of all surveys is a limitation of our survey as well. Due to the CHIS 2009 confidentiality agreement constraints, we did not have access to data on smoking-related variables collected at baseline by CHIS, limiting the number of variables we could assess for association in our analysis. Finally although CLSS is a well-validated population survey, the data are self-reported. A common limitation in questionnaire surveys is that respondent answers may reflect perceived socially acceptable behavior rather than actual behavior (Naiman et al., 2011). There is no report we are aware of that indicates those smokers who have a smoking ban are more likely to report inaccurate smoking levels compared to those who do not have such bans. Given there is no known differential bias according to home bans, we assume any mis-reporting is likely leading to attenuation of the true association towards the null (Armstrong et al., 1992), although Jurek et al. have argued that non-differential bias is not always linked to under-estimation of the true risk Jurek et al. (2005).

Conclusions

We found that living in a home with a total ban was associated with increased odds of both smoking reduction and making a quit attempt

compared to living in a home with no home ban. Smoking reduction has not been utilized as a measure of early stage quitting for those who cannot quit completely, but our study indicates that it is correlated with smoking bans with the same magnitude as quit attempts. We also found that perception of an outdoor smoking ban in one's city/town was associated with increased odds of both smoking reduction and making a quit attempt. Moreover, having both a home and city ban may lead to a stronger association with changing smoking behaviors, highlighting the potential value of increasing city-level smoking bans. These results provide quantitative evidence that smoking bans encourage quitting behaviors that positively impact smokers and nonsmokers, underscoring the public health importance of smoking bans inside and outside the home. Home smoking bans were associated with reductions in smoking suggesting that bans may also serve to decrease smoking among those who do not quit, and therefore decreasing their risks and eventually increasing their chances of quitting by making them less dependent on cigarettes.

Conflict of interest statement

The authors declare that there are no conflicts of interest.

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