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Trends in Home Smoking Bans in the U.S., 1995–2007: Prevalence, Discrepancies, and Disparities

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Abstract

Background—Home smoking bans significantly reduce the likelihood of secondhand smoke exposure among children and non-smoking adults. The purpose of this study was to examine national trends in a) the adoption of home smoking bans; b) discrepancies in parental smoking ban reports; and c) household and parental correlates of home smoking bans among households with underage children from 1995 to 2007.

Methods—We used data from the 1995/1996, 1998/1999, 2001/2002, 2003 and 2006/2007 Tobacco Use Supplement of the U.S. Current Population Survey to estimate prevalence rates and logistic regression models of parental smoking ban reports by survey period.

Results—Overall, the prevalence of a complete home smoking bans increased from 58.1% to 83.8% ($p<0.01$), while discrepancies in parental reports decreased from 12.5% to 4.6% ($p<0.01$) from 1995 to 2007. Households with single parent, low income, one or two current smokers, parents with less than a college education, or without infants were consistently less likely to report a home smoking ban over this period ($p<0.05$).

Conclusion—Despite general improvements in the adoption of home smoking bans and a reduction on parental discrepancies, disparities in the level of protection from secondhand smoke have persisted over time. Children living in households with single parents, low income, current smoker parents, less educated parents, or without infants are less likely to be protected by a home smoking ban. These groups are in need of interventions promoting the adoption of home smoking bans to reduce disparities in tobacco-related diseases.

Keywords

Home smoking bans; Trends; Health disparities; Secondhand smoke

Introduction

Children exposed to secondhand smoke (SHS) are at an increased risk for sudden infant death syndrome (SIDS), acute respiratory infections, recurring ear problems, and more

severe asthma.[1] The home is a primary location of SHS exposure for children.[1,2] Recently, attention has been drawn to a new proposed mode of involuntary exposure to tobacco constituents--thirdhand smoke (THS), which refers to residual tobacco smoke contamination that remains after the cigarettes is extinguished. [3] Children are especially susceptible to THS exposure because they breathe near, crawl and play on, touch, and mouth contaminated surfaces.[3] The adoption of a home smoking ban can significantly reduce the level of SHS and THS exposure. A home smoking ban refers to rules set up by household residents or other individuals to restrict or ban cigarette smoking inside the home.[4] Previous research has found an association between home smoking bans and a reduction in toddlers' mean urinary cotinine levels, an indicator of exposure to smoke.[5] Studies also suggest that household smoking rules convey an anti-tobacco social norm that help deter adolescents from smoking regardless of their parents or friends' smoking behavior.[6–9]

In the US, survey results indicate that the prevalence of home smoking bans has increased. [10,11] By 2008, the percentage of smoke-free homes ranged from 68.8% to 85.7% depending on the state.[12] However, the national trend has not been systematically examined for households with underage children, a population particularly vulnerable to the effects of SHS exposure.

Previous research indicates that smoking bans are associated with a number of individual and household characteristics, including race and ethnicity, presence and age of children, smoking status of household residents, educational attainment, household income, and smoking status of friends.[4,13–17] In general, home smoking bans are more frequently reported by individuals with higher education levels, higher income, with infants in the households, and with non-smoking friends. African-American were less likely to report a home smoking ban compared to Whites. However, the relationship between other household characteristics and a complete smoking ban remains understudied. For example, literature has consistently shown that children in single parent households have worse physical and mental outcomes than children in two-parent households.[18,19] Little is known regarding whether the household structure, i.e. nuclear family, paternal or maternal mono-parental households, may be related to likelihood of having a home smoking ban. There is also limited knowledge regarding possible changes in disparities on rates of home smoking bans by demographic and socioeconomic factors over time.

Analyses of home smoking bans have relied largely on the responses of one household member. Relatively few studies have investigated the discrepancies in perceptions among different household members. Children living in households where adults offer inconsistent reports about the home smoking ban may be at higher risk of SHS exposure than their counterparts in homes where both parents report the existence of a complete home smoking ban. The inconsistent report would suggest either a smoking ban has not really been adopted by all members of the households or the adopted smoking ban is not strongly enforced. Mumford et al. used 1998/1999 Tobacco Use Supplement (TUS) to the Current Population Survey (CPS) and found that nationally an estimated 12% of households with two or more adults provided inconsistent reports about home smoking bans.[20] Discrepancies varied by smoking status, socioeconomic status, race/ethnicity, and presence of children. However, as overall rates of home smoking bans have increased and social recognition of the harm of

SHS exposure, especially to children, has greatly improved over the last decade throughout the U.S., [21] the discrepancy rate may have changed. To date, we are unaware of any study examining this question. Yet, it has important implications for both research and public health policy.

The current study used data from the Tobacco Use Supplement of the Current Population Survey (TUS-CPS), a nationally representative survey. The data provided comparable measures to track national trends in the prevalence of home smoking bans in households with underage children from 1995 to 2007 as well as the evolution of parental discrepancies in the reporting of home smoking bans among two-parent households from 1995 to 2007. We investigated national trends in home smoking bans, household and parental characteristics associated with the establishment of home bans, and discrepant parental reports over this period.

METHODS

Study Population

We used data from the 1995–96, 1998–99, 2001–02, 2003 and 2006–07 TUS-CPS. The TUS-CPS is a survey of tobacco use administered as a supplement to the CPS. The TUS-CPS uses a sample of households and is designed to represent the civilian non-institutionalized population of the United States. All permanent household members aged 15 years or older are eligible for the interview. The TUS-CPS provides data on a nationally representative sample of about 240,000 individuals within a given survey period. For the five yearly survey periods, the TUS-CPS response rate, including both self- and proxy responses, were 84.5%, 83.5%, 75.0%, 75.2% and 73.7% respectively.

In the current study, because the analysis focused on home smoking rules, the analytical unit was the household. Only primary family households with underage children (<18 years old) were included in our analysis. We further divided the sample into two groups: two-parent households and single-parent households. A parent refers to a household's reference person or his/her spouse or partner and they did not need to be the child/children's biological parent. The no-smoking home bans were reported by one or both parents in two-parent households and by the single parent in single-parent households. Households were excluded from analyses if no response on home bans status from either the reference person or the spouse or partner was gathered. No proxy responses were collected on home smoking ban status.

Measures

Home smoking bans—All TUS survey respondents were asked a question about the smoking rules in their home. Based on evidence demonstrating the limited effectiveness of partial smoking bans in the household, [22,23] we classified respondents' answers into two categories: a complete smoking ban report (i.e., *"No one is allowed to smoke anywhere INSIDE YOUR HOME"*) versus a partial or no smoking ban report (i.e., "Smoking is allowed in some places or at some times *INSIDE YOUR HOME*" or "Smoking is permitted anywhere *INSIDE YOUR HOME*").

A household with a complete home smoking ban is a single-parent household in which the parent reported a complete ban or a two-parent household in which at least one parent reported a complete ban. Because there are households in the sample in which two parents/partners provided discrepant reports about home smoking bans, we classified two-parent households into two further categories: Households in which spouses/partners provided discrepant responses on the existence of a complete home smoking ban, and households where neither of the spouses/partners reported a complete home smoking ban. Analyses on discrepant reports included only two-parent households in which both parents answered to the question on home smoking ban status.

Individual and household variables—The following factors potentially associated with the establishment of a non-smoking rule in the home were analyzed: household structure, highest parental education level, age of the youngest child, annual household income, parental race/ethnicity, parental age, and parental smoking status. The specific categories considered are shown in Tables 1 and Table 2. Smoking status was assessed for each parent residing in the households. Based on parental smoking status, households were categorized into four groups: households where both parents are current smokers (he/she has smoked more than 100 cigarettes in their lifetime and currently smokes some days or every day), households with only one current smoker, households with no current smokers but where one or both parents were former smokers (he/she has smoked more than 100 cigarettes in their lifetime, but does not currently smoke), and households with neither current nor former smokers.

Statistical Analysis

Survey and household weights provided by the TUS-CPS were used to account for the complex sampling design and clustering to produce population estimates. We calculated simple descriptive statistics on the prevalence of a complete smoking ban over different survey periods. We then conducted multivariate logistic regressions to examine a) associations between sociodemographic and household-level variables and the establishment of a complete smoking ban by study period; and b) significant changes in prevalence from one survey period to the next. These analyses were stratified by household structure, i.e. two-parent versus single parent households.

Odds ratios (OR) and 95% confidence intervals (CI) estimated with the regression models described above were compared across survey periods to investigate whether there were significant changes in the relationships between each factor and home smoking ban status. Non-overlapping 95% CI were considered significant at the 95% level. All analyses were performed with the software STATA/SE 10.0 (StataCorp LP, College Station, TX).

RESULTS

Overall trends in home smoking bans

The overall prevalence of a complete home smoking ban in all household significantly increased from 58.1% of households in 1995–96 to 67.0% in 1998–1999, 72.8% in 2001–2002, 79.4% in 2003, and 83.8% in 2006–07, with this increase being statistically significant

for each study period compared to its previous one ($p<0.01$) after adjusting for individual and household characteristics.

Trends in home smoking bans among two parent households

As shown in Table 1, the overall prevalence of a complete home smoking ban within two-parent households (reflecting the percentage of households where at least one of the two parents reported the existence of a smoking ban; see below for analysis of discrepancies) has significantly increased from 62.6% in 1995–96 to 87.7% in 2006–07, with this increase being statistically significant for each study period compared to the previous one ($p<0.05$). The increase was observed regardless of parental educational level, age of youngest child, annual household income, parental race/ethnicity, parental smoking status, or parental ages. However, disparities in the distribution of home smoking bans persisted over time.

After adjusting for household- and individual-level confounding factors, reports regarding the existence of a complete home smoking among two parents households varied by highest parental education, age of youngest child, household income, parental race/ethnicity composition, parental smoking status, and parental ages. Highest parental education level was positively associated with the reporting of a complete home smoking ban. In contrast, age of youngest child was negatively associated with the likelihood of having a smoking ban. Annual household income and parental smoking status were found to be strong predictors of the existence of a complete home ban. Households with higher income were consistently more likely to adopt a complete home ban than households with lower income and this disparity seems to have increased over time as the adjusted OR value for households with an annual income of at least $50,000 versus households reporting an annual income of less than $25,000 grew from 1.32 in 1995–95 to 2.02 in 2006–07 ($p<0.05$). Regarding parental smoking status, in general, a gradient was observed indicating that households comprising only never smoker parents were most likely to have a complete ban, followed by those with no current but 1 or 2 former smoker(s), and then followed by households with 1 current smoker. Households with 2 current smoker parents were least likely to have a ban.

Households in which parents were Hispanic or White and Hispanic were consistently found to have greater odds of reporting a complete home smoking ban than households with White-only parents over the survey periods. At the same time, households in which both parents' age fell in the range of 18–29 were generally more likely to report a home smoking ban than other age combinations, particularly since 2003. Among two-parent households, in addition, the female parents were consistently less likely to report a complete home ban than their male partners after adjusting for demographic and socioeconomic factors. The OR value was 0.84 in 1995–1996, 0.84 in 1998/1999, 0.85 in 2001/2001, 0.82 in 2003, and 0.80 in 2006/2007($p<0.05$).

Trends in home smoking bans among single-parent households

An increasing prevalence of complete home smoking bans among single-parent households was also observed. The rates increased from 45.7% to 74.6%; the increase was statistically significant for every survey period compared to the previous one ($p<0.05$; Table 2). The gender of the parent (i.e. single-mother versus single-father household) did not affect the

odds of having a home smoking ban. The associations between other parental and household characteristics and the establishment of a home smoking ban were similar to those found for two-parent households.

Household structure and home smoking bans

In general, throughout all survey periods, single-parent households were consistently much less likely ($p<0.01$) than two-parent households to report a complete home smoking. The odds ratio was 0.52 in 1995–1996, 0.54 in 1998/1999, 0.60 in 2001/2001, 0.57 in 2003, and 0.58 in 2006/2007.

Discrepancies in parental reports among two-parent households

Our previous estimates for two-parent households reflected the percentage of households where **at least one** of the two parents reported the existence of a smoking ban in the home. However, our analyses revealed that two parents' reports were not always consistent with each other and the percentage of discrepant reports in two-parent households changed over time. Specifically, as shown in Figure 1, the percentage of households in which both parents agreed on the existence of a complete home smoking ban increased from 53.8% during 1995–96 to 85.2% during 2006–07. Accordingly, the percentage of households in which the two parents gave discrepant reported on a complete home smoking ban significantly decreased from 12.5% to 4.5% over time ($p<0.001$). In addition, the prevalence of households that lacked a complete home smoking ban according to both parents significantly decreased from 33.7% during 1995–95 to 10.3% during 2006–07($p<0.001$).

DISCUSSION

This study examined national trends in home smoking bans, individual- and household-level factors associated with the adoption of a complete home smoking ban, and parental discrepancies in the reporting of home smoking bans among households with underage children from 1995 to 2007.

Our findings reveal that even though the prevalence of a complete home smoking ban among households with underage children has risen over time, approximately 16% of households did not have any restrictions against smoking by 2006/2007 and children in these households were still potentially exposed to the harm of SHS exposure.

Furthermore, this study identified persisting disparities in the rate of adoption of a home smoking ban. Family structure, parental education, age of the youngest child, household income, race/ethnic composition, and smoking status emerged as factors significantly associated with the likelihood of having adopted a home smoking ban. Children living in single-parent households or with less educated parents were less likely to be protected by a complete smoking ban than their peers living in two-parent households or with more educated parents. This is particularly problematic considering previous research has found that single parents and less educated parents are more likely to smoke than married and more educated parents.[24, 25] Households with infants were most likely to restrict smoking in the home. This may reflect that parents underestimate the harms of SHS exposure among older children and calls for interventions to increase awareness regarding SHS exposure

among parents of older children. The disparity between households with higher and lower socioeconomic status persisted and even widened over time, pointing at the need to target low-income families to promote their use of home smoking bans and increase the protection of all children living in these households. Households with at least one Hispanic parent were more likely to establish a complete home ban than other race/ethnicity combinations. This result is consistent with previous research on Hispanic populations suggesting higher prevalence of home smoking bans among this population compared to other ethnic and racial groups.[2]

Consistent with results from previous studies, parental smoking status was the largest single factor associated with the odds of having a smoking ban in the home.[14–16] Households with 2 current smoker parents were 25 times less likely to have a complete home smoking ban compared to households with only never smoker(s). However, it is reassuring to find the prevalence of a complete ban within households with 2 current smokers has increased greatly from 14.1% in 1995/96 to 44.2% in 2006/07. A similar trend was observed by Pizacani et al. in a longitudinal study in Oregon indicating a 32% increase in complete bans over 21-month for households with at least one smoker.[26] Still the gap by parental smoking status persisted over time and this has important implications for future interventions. First, it indicates that children who are at highest risk for SHS exposure in the home, that is those living in households with current or former smokers, are indeed less likely to be protected by a home smoking ban. Second, it underscores the need to focus on families with one or two parents who smoke to promote their adoption of home smoking bans. Finally, it suggests that one of the most direct and effective ways to reduce the risk of SHS exposure in the households would be to promote smoking cessation. Jarvis et al. examined the impact of smoke-free homes on children's exposure to SHS, which was validated by cotinine measures, and they found that living in a smoke-free home offers children a considerable, but not complete, degree of protection against exposure to parental smoking. [27] Interestingly, younger parents in two-parent households seemed to be more likely to establish a complete home ban to ensure smoke free. This may suggest that the younger generations are more aware of the harm associated with exposure to SHS and THS.

In order for a home smoking ban to be effective, it is important that both parents within the household are in agreement. Discrepant reports between parents may reflect lax enforcement of the non-smoking rule to the point that one of the parents does not recognize the existence of such rule. Analyses concerning discrepancy/consistency reports among two-parent households regarding the existence and degree of a home smoking ban showed that the percentage of households in which both parents agreed on the existence of a complete home smoking ban kept rising while the percentage of households in which neither parent reported a complete home ban or households in which discrepant reports were provided shrunk over time. In particular, the extent of discrepant reports was over 10% before 2000, and then it decreased significantly to below 5% in 2003 and 2006–07. A reduction in the rates of discrepant parental reports regarding home smoking ban status along with an overall increase in the prevalence of home smoking bans during this 10-year period represents important progress toward reduction of SHS and THS exposure.

The trend observed in the level of parental concordance on home smoking ban reports has also important implications for research methodology. The results suggest that previous studies using home smoking ban data from before 2005 and based on individual reports may yield inaccurate estimates of the prevalence of these rules. Thus, researchers who use early data sources should take into account responses from more than one household member if they are available instead of relying on the answers from one individual household member. Based on the trend observed, this may be less of a problem for more recent and, presumably, future studies. Hence, in the context of limited resources, surveying only one parent in a two-parent household, particularly in households with no parental smoking, may be a more cost-effective way to get crude estimates on the use of home smoking bans.

Limitations

There are several limitations to our study. These limitations also suggest possible future research directions. First, there were minor changes in the wording of the TUS-CPS home smoking ban question after 2002. The 2003 and 2006 version of the question replaced ‘in your home’ with ‘inside your home’. In addition, the new version also added an explanation of the meaning of word ‘rule’ (i.e., “rules” include any unwritten “rules” and pertain to all people whether or not they reside in the home or are visitors, workmen, etc.’). Conceivably, most people would interpret “in your home” and “inside your home” as equivalent expressions. Yet when ‘rules’ not only apply to home residents but also visitors and workmen, it is possible that respondents to the new version of the question would underestimate the existence of a home ban compared to the old question. By comparison, this suggests that respondents to the old wording of the question, prior to 2003, may have overstated in their reports of complete home smoking bans (e.g. if household residents were not allowed to smoke but visitors or workers were not held to the same rule). This suggests that actual prevalence of a complete home smoking bans for the periods before 2003 periods may be lower than our estimates suggest, even though the likelihood that households that actively ban in-home smoking among residents are going to be comfortable with allowing visitors to smoke is small. The CPS also recoded its race/ethnicity question. Starting in 2003, respondents were able to select more than one race. This change may affect our estimates regarding the association between race/ethnicity and home smoking ban reports.

Secondly, a subset of the 2001–02 TUS-CPS sample was followed longitudinally and re-interviewed in 2003 round. The increase in the prevalence of a complete home smoking ban between 2001–2002 and 2003 was more marked than that between other survey periods. This may reflect repeated testing bias. Hence the results for that survey period may overestimate true prevalence rates of home smoking bans among the U.S. population.

Thirdly, all data are based on self-report. As awareness regarding the risks associated with SHS exposure have become more widely known over time, parents’ responses on home smoking bans may have be more affected by social desirability. Thus to prevent information bias, future research on home smoking bans should include objective measures as well, for example air quality detection.

In conclusion, the results presented in this study indicate that the overall prevalence of a complete home smoking ban within households with resident children under the age of 18

has increased from 1995 to 2007 in the US, regardless of various socio-demographic or household characteristics. The results also underscored that disparities on the adoption of an effective measure to reduce child exposure to SHS and THS persisted. Thus, it is important to focus tobacco control and prevention efforts on the factors that may impede the establishment of a complete home smoking ban among particular population groups. Children living in households with single parents, low income, current smoker parents, less educated parents, or without infants are less likely to be protected by a home smoking ban. These groups need to be targeted by future interventions in order to not only continue reducing SHS exposure among the US population as a whole, but also to reduce disparities in tobacco-related diseases.

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References

1. U.S. Dept. of Health and Human Services. The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General-Executive Summary. Department of Health and Human Services, Centers for Disease Control and Prevention, Coordinating Center for Health Promotion, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2006.
2. Wipfli H, Avila-Tang E, Navas-Acien A, et al. Secondhand Smoke Exposure among Women and Children: Evidence from 31 Countries. Am J Public Health. 2008; 98:672–679. [PubMed: 18309121]
3. Winickoff JP, Friebely J, Tanski SE, et al. Beliefs about the health effects of “thirdhand” smoke and home smoking bans. Pediatrics. 2009; 123:e74–e79. [PubMed: 19117850]
4. Martinez-Donate AP, Johnson-Kozlow M, Hovell MF, et al. Home Smoking Bans and Secondhand Smoke Exposure in Mexico and the US. Am J Prev Med. 2009; 48:207–212.
5. Spencer N, Blackburn C, Bonas S, et al. Parent Reported Home Smoking Bans and Toddler (18–30 month) smoke exposure: a cross-sectional survey. Arch Dis Child. 2005; 90:670–674. [PubMed: 15970606]
6. Rainio SU, Rimpela AH. Home Smoking Bans in Finland and the Association with Child Smoking. Eur J Public Health. 2007; 18:306–311. [PubMed: 17925322]
7. Szabo E, White V, Hayman J. Can Home Smoking Restrictions Influence Adolescents’ Smoking Behaviors if Their Parents and Friends Smoke? Addict Behav. 2006; 31:2298–2303. [PubMed: 16600522]
8. Clark, PI., Schooley, MW., Pierce, B., et al. [accessed Feb 28, 2011] Impact of Home Smoking Rules on Smoking Patterns among Adolescents and Young Adults. Prev Chronic Dis. 2006 Apr 3. http://www.cdc.gov/pcd/issues/2006/apr/05_0028.htm
9. Farkas AJ, Gilpin EA, White MM, et al. Association between Household and Workplace Smoking Restrictions and Adolescent Smoking. JAMA. 2000; 284:717–722. [PubMed: 10927780]
10. Levy DT, Romano E, Mumford EA. Recent Trends in Home and Work Smoking Bans. Tob Control. 2004; 13:258–263. [PubMed: 15333881]
11. U.S. Centers for Disease Control and Prevention. [access April 21, 2011] State-Specific prevalence of smok-free home rules-United States 1992–2003. 2008. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5620a3.htm
12. U.S. Centers for Disease Control and Prevention. [accessed Feb 28, 2011] State-Specific Prevalence of Current Cigarette Smoking among Adults and Secondhand Smoke Exposure and Smoke-free Home Rules. 2008. http://www.ok.gov/stopswithme/documents/MMWR%20Highlights%20State-Specific%20Prevalence.pdf

13. Pizacani BA, Martin DP, Stark MJ, et al. Household Smoking Bans: Which Households Have Them and Do They Work? Am J Prev Med. 2003; 36:99–107.
14. Norman GJ, Ribisl KM, Howard-Pitney B, et al. Smoking Bans in the Home and Car: Do Those Who Really Need Them Have Them? Am J Prev Med. 1999; 29:582–589.
15. Gilpin EA, White MM, Farkas AJ, et al. Home Smoking Restrictions: Which Smokers Have Them and How They Are Associated with Smoking Behavior. Nicotine Tob Res. 1999; 1:153–162. [PubMed: 11072396]
16. Binns HJ, O'Neil J, Irwin Benuck, et al. Influences on Parents' Decisions for Home and Automobile Smoking Bans in Household with Smokers. Patient Educ Couns. 2009; 74:272–276. [PubMed: 18938054]
17. Borland R, Yong HH, Cummings KM, et al. Determinants and Consequences of Smoke-free Homes: Findings from the International Tobacco Control (ITC) Four Country Survey. Tob Control. 2006; 15:42–50.
18. Fergusson DM, Boden JM, Horwood J. Exposure to Single Parenthood in Childhood and Later Mental Health, Educational, Economic, and Criminal Behavior Outcomes. Arch Gen Psychiatry. 2007; 64:1089–1095. [PubMed: 17768274]
19. Bramlett MD, Blumberg SJ. Family Structure and Children's Physical and Mental Health. Health Aff (Millwood). 2007; 26:549–558. [PubMed: 17339685]
20. Mumford EA, Levy DT, Romano EO. Home Smoking Restrictions: Problems in Classification. Am J Prev Med. 2004; 27:126–131.
21. Hyland A, Higbee C, Borland R, et al. Attitudes and Beliefs about Secondhand Smoke and Smoke-free Policies in Four Countries: Findings from the International Tobacco Control Four Country Survey. Nicotine Tob Res. 2009; 11:642–649. [PubMed: 19454550]
22. Wakefield M, Banham D, BA, et al. Restrictions on Smoking at Home and Urinary Cotinine Levels among Children with Asthma. Am J Prev Med. 2000; 19:188–192. [PubMed: 11020596]
23. Blackburn C, Spencer N, Bonas S, et al. Effect of Strategies to Reduce Exposure of Infants to Environmental Tobacco Smoke in the Home: Cross Sectional Survey. BMJ. 2003; 327:257–261. [PubMed: 12896936]
24. Jun HJ, Acevedo-Garcia D. The effect of single motherhood on smoking by socioeconomic status and race/ethnicity. Soc Sci Med. 2007; 65:653–666. [PubMed: 17493724]
25. Kanjilal S, Gregg EW, Cheng YJ. Socioeconomic status and trends in disparities in 4 major risk factors for cardiovascular disease among US adults, 1971–2002. Arch Intern Med. 2006; 166:2348–55. [PubMed: 17130388]
26. Pizacani BA, Martin DP, et al. Longitudinal study of household smoking ban adoption among households with at least one smoker: Associated factors, barriers, and smoker support. Nicotine Tob Res. 2008; 10:533–540. [PubMed: 18324573]
27. Jarvis MJ, Mindell J, Gilmore A, et al. Smoke-free homes in England: prevalence, trends and validation by cotinine in children. Tob Control. 2009; 18:491–495. [PubMed: 19748885]

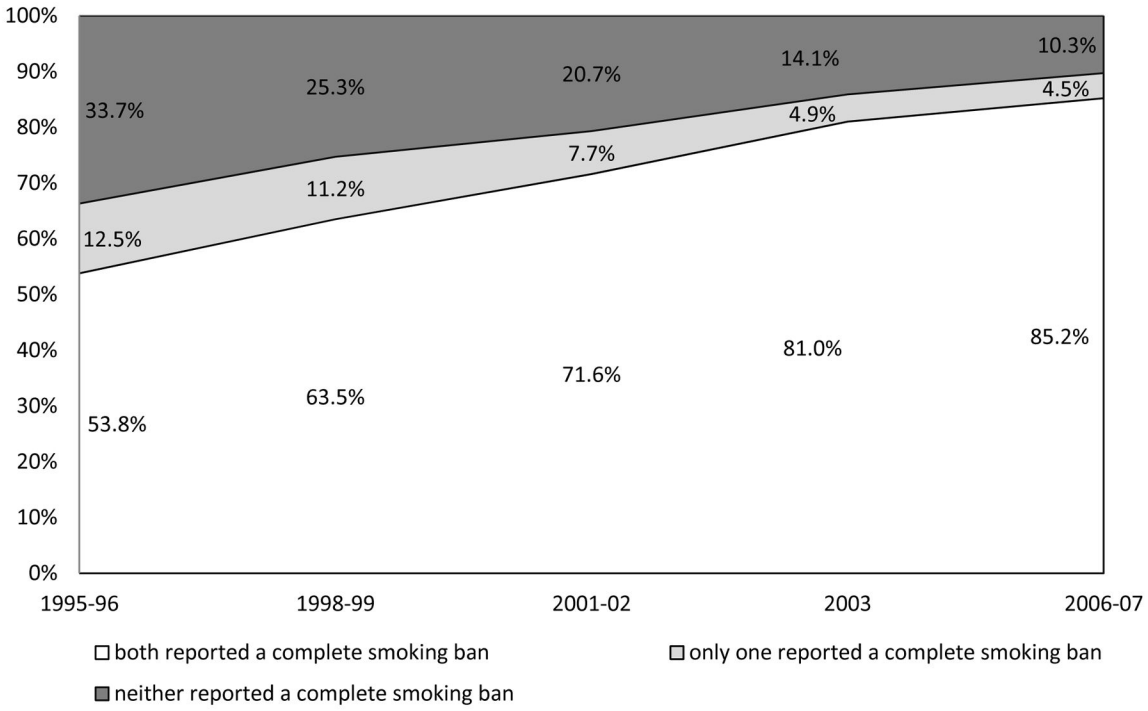

Figure 1.

Trends in parental responses regarding the existence of a home smoking ban among two-parent households [1], US, 1995–2007

1 Two-parent households included those in which both of the parents gave valid responses

Table 1

Sociodemographic factors associated with establishment of a complete smoking home ban[1] among **two-parent** households (1995–2007)

Household Characteristics	1995–1996 N[2]=34,024		1998–1999 N=31,667		2001–2002 N=31,629		2003 N=31,146		2006–2007 N=28,685	
	Complete ban (%)	Adjusted OR & 95% CI	Complete ban (%)	Adjusted OR & 95% CI	Complete ban (%)	Adjusted OR & 95% CI	Complete ban (%)	Adjusted OR & 95% CI	Complete ban (%)	Adjusted OR & 95% CI
Overall	62.6	Ref	71.4	1.50 (1.43–1.57)	77.0	2.06 (1.96–2.17)	83.7	3.11 (2.94–3.28)	87.7	4.70 (4.43–4.99)
Response										
Only 1 response	58.3	Ref	68.3	Ref	74.9	Ref	81.8	Ref	86.4	Ref
2 responses	66.3	1.74 (1.63–1.85)	74.8	1.73 (1.61–1.85)	79.3	1.47 (1.36–1.59)	85.9	1.46 (1.33–1.59)	89.7	1.65 (1.49–1.83)
Highest education level										
Less than high school	54.3	Ref	66.3	Ref	72.5	Ref	81.1	Ref	84.3	Ref
High school graduate	54.5	1.35 (1.16–1.56)	63.1	1.23 (1.05–1.46)	69.1	1.33 (1.10–1.62)	77.1	1.27 (1.04–1.56)	81.9	1.39 (1.11–1.74)
College graduate	76.9	2.18 (1.86–2.55)	83.3	2.07 (1.74–2.47)	87.4	2.32 (1.88–2.86)	91.5	2.21 (1.77–2.76)	94.2	2.46 (1.92–3.16)
Age of youngest child										
Less than 1 year	72.2	Ref	80.7	Ref	84.7	Ref	90.7	Ref	92.5	Ref
1–5 years	65.1	0.69 (0.61–0.78)	74.7	0.67 (0.58–0.77)	80.4	0.73 (0.62–0.86)	85.9	0.69 (0.56–0.84)	90.6	0.83 (0.66–1.04)
6–12 years	59.5	0.56 (0.49–0.64)	67.9	0.55 (0.47–0.64)	73.6	0.51 (0.43–0.60)	81.6	0.54 (0.44–0.66)	85.4	0.57 (0.45–0.72)
13 years or greater	57.6	0.50 (0.43–0.57)	65.9	0.51 (0.43–0.60)	72.4	0.52 (0.43–0.62)	79.1	0.50 (0.40–0.62)	83.5	0.52 (0.41–0.67)
Household annual income										
Less than 25,000	54.7	Ref	61.7	Ref	67.2	Ref	75.0	Ref	79.3	Ref
25,000–49,999	58.4	1.09 (0.99–1.19)	66.5	1.28 (1.15–1.43)	71.8	1.28 (1.13–1.45)	79.0	1.34 (1.17–1.53)	82.7	1.20 (1.02–1.41)
50,000 or greater	70.3	1.32 (1.19–1.45)	77.6	1.70 (1.52–1.90)	81.7	1.64 (1.45–1.87)	87.5	1.93 (1.69–2.21)	91.0	2.02 (1.73–2.37)
Parental race/ethnicity										
Both NH White[3]	60.2	Ref	69.3	Ref	74.9	Ref	81.8	Ref	86.1	Ref
Both NH African American	61.4	1.03 (0.90–1.18)	69.4	1.10 (0.95–1.26)	74.5	0.88 (0.76–1.03)	81.6	0.96 (0.80–1.16)	86.2	0.90 (0.72–1.12)
Both Hispanic	74.4	2.58 (2.25–2.95)	82.6	2.71 (2.33–3.16)	87.1	2.91 (2.42–3.51)	91.3	2.69 (2.19–3.31)	93.5	2.77 (2.22–3.45)
Both Other	77.3	1.96 (1.60–2.41)	78.5	1.39 (1.13–1.71)	86.4	1.58 (1.24–2.01)	89.6	1.65 (1.29–2.12)	91.9	1.40 (1.06–1.85)
NH White/NH African American	62.7	1.61 (1.02–2.52)	63.9	0.77 (0.53–1.11)	65.5	0.81 (0.58–1.15)	74.7	0.71 (0.43–1.17)	82.5	0.77 (0.47–1.26)
NH White/Hispanic	72.5	1.82 (1.51–2.19)	74.7	1.36 (1.10–1.67)	82.2	1.85 (1.47–2.32)	85.5	1.60 (1.27–2.02)	90.1	1.42 (1.10–1.83)
NH White/Other	64.1	1.45 (1.15–1.83)	73.6	1.39 (1.07–1.80)	77.2	1.16 (0.88–1.53)	82.9	1.15 (0.90–1.47)	89.2	1.25 (0.91–1.71)

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Household Characteristics	1995–1996 N[2]=34,024		1998–1999 N=31,667		2001–2002 N=31,629		2003 N=31,146		2006–2007 N=28,685	
	Complete ban (%)	Adjusted OR & 95% CI	Complete ban (%)	Adjusted OR & 95% CI	Complete ban (%)	Adjusted OR & 95% CI	Complete ban (%)	Adjusted OR & 95% CI	Complete ban (%)	Adjusted OR & 95% CI
Other Combinations	66.0	1.38 (0.87–2.20)	74.4	1.42 (0.87–2.31)	80.5	1.66 (1.00–2.72)	88.5	1.78 (1.04–3.04)	86.4	0.84 (0.51–1.40)
Parental smoking status										
Only never smoker(s)	83.7	Ref	89.4	Ref	92.2	Ref	94.6	Ref	96.2	Ref
No current, but 1 or 2 former smoker(s)	74.4	0.63 (0.58–0.69)	80.4	0.55 (0.50–0.61)	85.7	0.60 (0.53–0.67)	90.4	0.64 (0.56–0.73)	93.8	0.69 (0.58–0.81)
1 current smoker	34.5	0.12 (0.11–0.13)	43.3	0.11 (0.10–0.12)	50.2	0.11 (0.10–0.12)	59.9	0.11 (0.10–0.12)	67.7	0.10 (0.09–0.12)
2 current smokers	14.1	0.04 (0.03–0.04)	19.5	0.04 (0.03–0.04)	25.4	0.04 (0.03–0.05)	34.0	0.04 (0.03–0.05)	44.2	0.04 (0.03–0.05)
Parental age										
Both 18–29	63.2	Ref	73.4	Ref	76.1	Ref	84.3	Ref	89.8	Ref
Both 30–39	63.4	0.91 (0.80–1.03)	74.0	0.75 (0.65–0.87)	79.6	0.88 (0.75–1.04)	86.1	0.74 (0.62–0.90)	89.9	0.64 (0.52–0.80)
Both 40–49	65.0	0.96 (0.83–1.11)	72.3	0.70 (0.60–0.83)	77.0	0.81 (0.67–0.96)	83.1	0.60 (0.49–0.74)	87.4	0.53 (0.42–0.66)
Both 50 or greater	58.3	0.79 (0.66–0.95)	66.2	0.58 (0.48–0.71)	72.9	0.59 (0.48–0.73)	83.4	0.51 (0.40–0.65)	84.6	0.45 (0.34–0.59)
18–29/30–39	61.0	0.92 (0.79–1.07)	71.0	0.77 (0.65–0.92)	77.8	0.88 (0.72–1.06)	83.9	0.79 (0.63–1.00)	88.2	0.75 (0.58–0.97)
30–39/40–49	60.8	0.93 (0.81–1.07)	68.0	0.65 (0.55–0.76)	75.2	0.81 (0.67–0.97)	82.6	0.68 (0.55–0.83)	86.9	0.60 (0.47–0.76)
40–49/50 or greater	62.0	0.93 (0.78–1.11)	69.3	0.62 (0.51–0.76)	76.3	0.80 (0.65–0.99)	80.4	0.60 (0.47–0.76)	84.6	0.47 (0.36–0.62)
Other combinations	54.3	0.78 (0.61–1.01)	61.1	0.57 (0.43–0.75)	69.1	0.71 (0.53–0.95)	74.7	0.47 (0.33–0.63)	83.4	0.57 (0.38–0.84)

[1] A complete home smoking ban within two-parent households was defined as one or both parents reported “no one is allowed to smoke anywhere INSIDE YOUR HOME”

[2] N represents the number of two-parent households in our sample for each survey period

[3] NH: Non-Hispanic

Table 2

Sociodemographic factors associated with establishment of a complete smoking home ban[1] among single-parent households (1995–2007)

Household Characteristics	1995–1996 N[2]=11,856		1998–1999 N=11,136		2001–2002 N=11,777		2003 N=11,586		2006–2007 N=11,466	
	Complete ban (%)	Adjusted OR & 95% CI	Complete ban (%)	Adjusted OR & 95% CI	Complete ban (%)	Adjusted OR & 95% CI	Complete ban (%)	Adjusted OR & 95% CI	Complete ban (%)	Adjusted OR & 95% CI
Overall	45.7	Ref	55.1	1.50 (1.40–1.61)	62.1	2.05 (1.90–2.20)	68.4	2.78 (2.57–3.00)	74.6	4.00 (3.70–4.32)
Parental gender										
Male	42.0	Ref	52.9	Ref	60.9	Ref	67.3	Ref	73.3	Ref
Female	46.4	1.14 (0.99–1.32)	55.6	1.16 (1.00–1.34)	62.4	1.07 (0.92–1.24)	68.6	1.01 (0.87–1.17)	74.8	1.01 (0.86–1.19)
Education level										
Less than high school	43.1	Ref	49.1	1.00	57.0	Ref	61.0	Ref	67.3	Ref
High school graduate	43.0	1.20 (1.05–1.37)	53.4	1.37 (1.19–1.58)	60.1	1.22 (1.05–1.41)	67.2	1.62 (1.39–1.89)	73.5	1.42 (1.21–1.66)
College graduate	66.2	2.31 (1.89–2.82)	73.9	2.23 (1.80–2.76)	79.4	2.27 (1.82–2.83)	84.2	2.98 (2.33–3.80)	87.9	2.15 (1.68–2.74)
Age of youngest child										
Less than 1 year	50.5	Ref	60.6	Ref	68.8	Ref	74.5	Ref	76.6	Ref
1–5 years	45.2	0.74 (0.60–0.92)	54.2	0.68 (0.55–0.85)	62.9	0.64 (0.50–0.81)	69.1	0.65 (0.50–0.85)	74.3	0.78 (0.61–1.00)
6–12 years	45.3	0.79 (0.63–0.98)	55.5	0.65 (0.52–0.82)	61.1	0.54 (0.42–0.69)	68.0	0.55 (0.42–0.72)	75.4	0.71 (0.55–0.92)
13 years or greater	45.4	0.69 (0.55–0.87)	54.6	0.63 (0.49–0.80)	60.6	0.49 (0.38–0.64)	66.0	0.50 (0.37–0.66)	72.9	0.60 (0.46–0.79)
Household annual income										
Less than 25,000	43.1	Ref	51.3	Ref	56.6	Ref	63.1	Ref	69.1	Ref
25,000–49,999	48.6	1.11 (0.98–1.26)	59.1	1.23 (1.09–1.40)	66.4	1.43 (1.26–1.61)	70.7	1.31 (1.15–1.49)	76.4	1.35 (1.17–1.55)
50,000 or greater	59.7	1.41 (1.14–1.74)	64.6	1.40 (1.16–1.69)	69.9	1.45 (1.22–1.73)	78.4	1.63 (1.35–1.97)	83.4	1.71 (1.43–2.05)
Parental race/ethnicity										
NH White[3]	39.4	Ref	49.6	Ref	56.8	Ref	62.9	Ref	69.9	Ref
NH African American	46.3	1.02 (0.90–1.14)	55.3	0.97 (0.85–1.09)	62.4	0.91 (0.79–1.03)	67.3	0.86 (0.75–0.99)	73.5	0.74 (0.63–0.86)
Hispanic	65.0	2.49 (2.11–2.94)	73.1	2.57 (2.14–3.08)	79.7	2.51 (2.08–3.04)	84.6	2.59 (2.12–3.18)	88.2	2.32 (1.88–2.86)
Other	58.5	1.89 (1.43–2.50)	63.5	1.73 (1.24–2.41)	68.6	1.48 (1.10–1.99))	73.2	1.53 (1.16–2.03)	79.0	1.30 (0.98–1.73)
Parental smoking status										
never smoker	67.0	Ref	75.1	Ref	80.2	Ref	84.8	Ref	89.4	Ref
former smoker	55.3	0.63 (0.55–0.72)	66.9	0.68 (0.59–0.78)	74.3	0.72 (0.62–0.84)	77.8	0.62 (0.52–0.74)	83.6	0.59 (0.49–0.72)

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Household Characteristics	1995–1996 N[2]=11,856		1998–1999 N=11,136		2001–2002 N=11,777		2003 N=11,586		2006–2007 N=11,466	
	Complete ban (%)	Adjusted OR & 95% CI	Complete ban (%)	Adjusted OR & 95% CI	Complete ban (%)	Adjusted OR & 95% CI	Complete ban (%)	Adjusted OR & 95% CI	Complete ban (%)	Adjusted OR & 95% CI
current smoker	12.5	0.08 (0.07–0.09)	18.1	0.08 (0.07–0.09)	25.4	0.09 (0.08–0.10)	32.4	0.09 (0.08–0.11)	39.5	0.08 (0.07–0.09)
Parental age										
18–29	45.4	Ref	53.7	Ref	61.7	Ref	66.8	Ref	73.3	Ref
30–39	42.6	0.98 (0.85–1.13)	53.3	1.08 (0.93–1.25)	61.9	1.16 (0.99–1.35)	69.0	1.08 (0.92–1.28)	75.5	0.99 (0.82–1.18)
40–49	50.0	1.15 (0.97–1.35)	57.5	1.24 (1.05–1.46)	62.1	1.06 (0.89–1.27)	68.5	0.99 (0.83–1.19)	74.8	0.92 (0.76–1.12)
50 or greater	47.3	0.93 (0.77–1.13)	58.2	1.05 (0.87–1.28)	63.9	0.95 (0.78–1.17)	69.6	0.92 (0.74–1.14)	74.3	0.76 (0.86–1.19)

[1] A complete home smoking ban within single-parent households was defined as the parent reported “no one is allowed to smoke anywhere INSIDE YOUR HOME”

[2] N represents the number of single-parent households in our sample for each survey period

[3] NH: Non-Hispanic