Home Smoking Bans Among U.S. Households with Children and Smokers

Opportunities for Intervention

Alice L. Mills, MD, MPH, Martha M. White, MS, John P. Pierce, PhD, Karen Messer, PhD

Background: Public health campaigns have reduced the exposure of U.S. children to secondhand smoke at home; however, these may not have been equally effective across subgroups.

Purpose: To examine prevalence of home smoking bans among U.S. households with both children and smokers, over time and by demographic subgroups.

Methods: The Tobacco Use Supplement to the Current Population Survey (TUS-CPS) is a nationally representative household survey of tobacco use. The 1992/1993 and 2006/2007 TUS-CPS interviewed 22,746 households from a major racial/ethnic group with both children and adult smokers. Predictors of complete home smoking bans among demographic subgroups were identified using multivariate logistic regression. Analyses were conducted in 2010–2011.

Results: Complete home smoking bans among U.S. households with children and smokers (smoking families) more than tripled, from 14.1% in 1992/1993 to 50.0% in 2006/2007. However, non-Hispanic white and African-American smoking families lagged behind Asian/Pacific Islanders and Hispanics. In 2006/2007, 67.2% of African-American smoking families allowed smoking in the home, as did 59.2% of smoking families with all children aged ≥14 years. Bans were more likely among more-educated households and in states with lower adult smoking prevalence; however, these differences were attenuated in some racial/ethnic groups.

Conclusions: As of 2006/2007, only half of U.S. households with both children and smokers had complete home smoking bans. Home bans were less common among smoking families with older children, in African-American households, and in Hispanic or non-Hispanic white households in states with high smoking prevalence. Interventions are needed to promote smokefree homes among these groups.

(Am J Prev Med 2011;41(6):559–565)

Introduction

For children, the home is the primary site of exposure to secondhand smoke (SHS),[1,2] which is known to cause premature disease and death.[3] Children living in a home with an adult smoker are up to twice as likely to take up smoking themselves.[4,5] In 1994, an estimated 35% of U.S. children lived with regular smoking in the home.[6] By 2000, this had decreased to 25%.[7] There is a wide variation in recent estimates of SHS exposure from 7.6%[8] of all children to 17%–18% of children aged 3–19 years,[9] suggesting that SHS exposure may differ markedly across the country. Strong evidence exists indicating declines in childhood exposure to SHS in the home, likely because of the spread of anti-tobacco social norms, associated reductions in adult smoking prevalence and cigarette consumption levels, and increased prevalence of complete home smoking bans ("smokefree homes").[7,9–11] However, these factors vary across states and racial/ethnic groups, and there remain demographic subgroups whose children have high exposure to SHS.[8] Effective strategies to address these disparities are urgently needed.

In households with a smoker, implementation of a complete home smoking ban will reduce SHS exposure among nonsmoking residents.[10] An estimated 98% of children living with a smoker in the home have serum cotinine levels greater than 0.05 ng/mL, compared with 40% of children not living with a smoker.[9] The number of cigarettes smoked inside the home is a predictor of cotinine levels for children,[9,12] and in families with smokers, a smokefree home

From the Moores UCSD Cancer Center, University of California San Diego, La Jolla, California

Address correspondence to: Karen Messer, PhD, Cancer Prevention and Control Program, Moores UCSD Cancer Center,Gilman Drive, University of California, La Jolla CA 92093-0901. E-mail: kmesser@ucsd.edu.

0749-3797/$36.00

doi: 10.1016/j.amepre.2011.08.016

has been shown to reduce cotinine levels in infants by up to 85%.[13] Among preadolescent and adolescent children, living in a home with a complete home smoking ban also promotes anti-smoking attitudes and reduces the risk of future tobacco use.[4,14–16] However, despite these benefits, households that include a current smoker are much less likely than nonsmoking households to have a complete home smoking ban.[17]

In addition to presence/absence of a smoker in the home, other established predictors of a home smoking ban include race/ethnicity, income, educational level, presence of children in the home,[8–13,17,18] and exposure to smokefree legislation, tobacco-control programs, or media campaigns.[10,19,20] The public health approach to reduce sudden infant death syndrome recommends forbidding smoking around infants, and thus households with infants may be more likely to have a home smoking ban than those with older children. At the state level, smoking prevalence is associated with prevalence of home smoking bans.[8,10]

Previous estimates of children's exposure to SHS in the home have asked the parent most engaged in the child's health care *Does anyone smoke in the home?*[8,9] However, smokers and nonsmokers in the same household tend to report home smoking rules differently,[21] and this assessment strategy has potential to underestimate SHS exposure in households with smokers. In addition, given the evidence that complete, as opposed to partial, home smoking bans are associated with lower levels of urine cotinine in children,[22,23] it may be important to assess the specific rules regarding smoking in the home.

See Commentary by Hovell et al. in this issue.

The Tobacco Use Supplements to the U.S. Current Population Survey (TUS-CPS) are conducted by the U.S. Census Bureau under sponsorship from the National Cancer Institute, and their large sample sizes and representative nature allow reliable estimates by demographic groups within states. From 1992/1993 to 2006/2007, the TUS-CPS includes detailed assessment of home smoking restrictions from all adult household members. It was hypothesized that the TUS-CPS could be used to identify demographic groups of smoking families with low prevalence of home smoking bans: from the 1992/1993 and 2006/2007 TUS-CPS, the presence or absence of a complete home smoking ban was determined among households with both children and smokers ("smoking families"), using a smoking adult as the household respondent. Although the prevalence of home smoking bans generally increased across the study period, it was hypothesized that this increase would not hold uniformly for smoking families of different racial/ethnic groups. It was expected that the likelihood of a home smoking ban might differ by household educational level and age of youngest child, but it was hypothesized that these factors might be more important for some racial/ethnic groups than for others. Understanding these differences among smoking families should help target effective interventions for different racial/ethnic groups and should inform future health policy.

Methods

Data Source

The CPS uses a monthly random sample of occupied housing units in the U.S., with response rates higher than 90%.[24] The TUS is periodically included in three independent CPS monthly samples. The present study used data from households containing at least one child and at least one self-respondent adult smoker in the 1992/1993 and 2006/2007 TUS-CPS. The TUS-CPS self-response rate is more than 61%, among the highest in population survey research.[25]

Demographic and Smoking Measures

Following standard practice, current smokers were those who reported ever smoking at least 100 cigarettes, and now smoking every day or some days. The present study selected as the household respondent the first adult current smoker in the self-respondent data file from each household. Respondents were asked *Which statement best describes the rules about smoking inside your home*? with answers: (1) no one is allowed to smoke anywhere inside your home; (2) smoking is allowed in some places or at some times inside your home; and (3) smoking is permitted anywhere inside your home. The first answer identified a complete home smoking ban (a "smokefree home").

Additional variables included race/ethnicity; household poverty status (U.S. Census Bureau thresholds, based on family size and number of children[26]); educational attainment; and age of youngest child. Households with adults from more than one racial/ethnic group or who self-identified as "other" were excluded because of low sample sizes. Sample sizes were 16,789 households in 1992/1993 and 5957 households in 2006/2007. State-level adult smoking prevalence for each racial/ethnic group was computed from the full TUS-CPS as a proxy for state-level anti-tobacco social norms.[11]

Statistical Analysis

Estimates were weighted using the household respondent's person-level TUS-CPS survey weights. Variance estimates used replicate weights with Fay's balanced repeated replication.[24] Estimated adult smoking prevalence by state and race/ethnicity was not reported for samples with 30 or fewer households: Asian/Pacific Islanders did not have adequate sample sizes for analysis. Logistic regression models were used to identify predictors of a smokefree home, including interaction terms to investigate differences in increase in smokefree homes by race/ethnicity. Computations were carried out in SAS, version 9.2. Analyses were conducted in 2010–2011.