HHS Public Access

Author manuscript

J Community Health. Author manuscript; available in PMC 2019 August 01.

Published in final edited form as:

J Community Health. 2018 August ; 43(4): 746–755. doi:10.1007/s10900-018-0479-z.

Prevalence and Indicators of Household Smoking Bans among American Indians

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Abstract

More than 58 million nonsmokers in the U.S. encounter secondhand smoke that leads to tobacco-related diseases and deaths every year, making voluntary household smoking bans an important public health goal. American Indians/Alaska Natives are rarely included in research related to household smoking bans. Further, most studies dichotomize household smoking bans into complete bans versus partial/no bans, rendering it impossible to determine if partial and no bans are associated with different or similar risk factors. Using the 2014 Cherokee Nation American Indian Adult Tobacco Survey, our study sought to identify prevalence of household smoking bans, their extent, and their correlates in an American Indian population. This cross-sectional analysis used multinomial logistic regression to determine correlates of complete, partial, and no household smoking bans. Results indicated that approximately 84% of Cherokee households have a complete ban. Younger age, female gender, higher education, higher household income, respondent's nonsmoking status, good health, better awareness of harms related to secondhand smoke, visits with a healthcare provider within the past year, and children in the home were positively and significantly associated with complete household smoking bans. Additionally, there were notable differences between correlates related to partial bans and no bans. These results provide insight for the development of more appropriate interventions for American Indian households that do not have a complete household smoking ban.

Keywords

American Indian; Secondhand Smoke Exposure; Household Smoking Ban

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Conflict of Interest

The authors declare that they have no conflict of interest.

Introduction

Secondhand smoke (SHS) increases the risk of heart disease and lung cancer in nonsmoking adults [1]. In children, it can increase the risk of sudden infant death syndrome, acute respiratory infections, middle ear disease, asthma, respiratory symptoms, and decreased lung function [1]. Although SHS exposure has declined in recent years, 58 million nonsmokers in the U.S. regularly confronted this health issue between 2011 and 2012 [2]. Subsequent to recent laws restricting smoking in public places, the home has become one of the primary sites for SHS exposure [1, 3]. Accordingly, household smoking bans–defined as voluntary restrictions on cigarette smoking inside the home–are an important step toward reducing total SHS exposure and its health consequences [1, 3]. Some households enforce at least *partial* bans that allow smoking in certain areas or at certain times and others enforce *complete* household smoking bans that prohibit smoking anywhere or any time in the home. Factors positively associated with complete household smoking bans include nonsmokers living or visiting in the home, higher household income, older age, two-parent households, availability of outdoor space, better awareness of harms related to SHS, workplace indoor smoking restrictions and presence of children in the home [4–11].

American Indians/Alaska Natives (AI/AN) have the highest prevalence of cigarette smoking (26%) compared to both Whites (19%) and Blacks (18%), and are disproportionately affected by tobacco-related diseases, such as heart disease and stroke [4, 12–13]. Despite this disparity, not much is known about household smoking bans in this population and their SHS exposure is not well established [4–9, 11, 14–15]. This is problematic because tribes have a unique relationship with tobacco: tribal members often conceive tobacco as a sacred plant and use it ceremonially in spiritual practices, rituals, prayers and other cultural activities [16]. Ceremonial tobacco differs from commercial tobacco in the way it is planted and grown, harvested, prepared, used, and often is differentiated by the type of tobacco species used. More importantly, ceremonial tobacco can either be smoked or used in a way that does not involve smoking [17]. The frequency of ceremonial tobacco use differs across individuals and tribes, with some AI using ceremonial tobacco daily and others only on special occasions [17]. Despite differences between ceremonial and commercial tobacco, beliefs related to the spiritual meanings of tobacco and its ceremonial use can promote abstinence from commercial tobacco in some AI populations, and this knowledge has proven useful in developing culturally-tailored prevention and cessation interventions [16, 18–21].

The role of ceremonial tobacco as a unique protective factor against commercial tobacco use in AIs [16, 18–21], raises the possibility that it may likewise protect against other tobacco-related behaviors, such as allowing smoking in the home. However, no studies have examined whether ceremonial tobacco use is associated with complete household smoking bans, nor is it known if protective factors for complete bans identified in other U.S. population subgroups are similarly correlated for AI/ANs. It is also not known if households with partial bans have different facilitators or barriers to adopting complete bans as compared to households with no bans. Such fundamental information is needed to devise culturally sensitive interventions.

Using the 2014 Cherokee Nation American Indian Adult Tobacco Survey, our study sought to identify prevalence of household smoking bans of varying extent and their correlates in this AI population. We hypothesized that the odds of a complete household smoking ban among AIs would resemble those observed in the general population, increasing for individuals who are older, are highly educated, have higher income, are nonsmokers, perceive SHS as harmful, report better health, and have seen a healthcare provider within the previous year. In addition, we expected that reported use of tobacco as part of ceremonial practice would be positively associated with complete household smoking bans.

Methods

Overview

Cherokee Nation is a tribe with a jurisdictional service area encompassing 14 counties in northeastern Oklahoma. Within this jurisdiction, Cherokee Nation provides tribal governmental services to tribal members and asserts other forms of government authority. With more than 320,000 registered citizens, it is one of the most populous tribes in the nation; it is also culturally diverse, with citizens embracing tribal traditions, including ceremonial tobacco use, to varying degrees.

Cherokee Nation American Indian Adult Tobacco Survey

After Cherokee Nation Institutional Review Board approval, an adapted version of the American Indian Adult Tobacco Survey was used to describe tobacco use, knowledge, and attitudes at the county level. The abbreviated instrument reduced participant time commitment yet retained important tobacco-related questions. The target sample was Cherokee Nation adult citizens (≥18 years) living within the Cherokee Nation Tribal Jurisdictional Service Area who have used the Cherokee Nation Health Services. Participant telephone contact information for the survey was derived from the Cherokee Nation Health Services registration database, which contains contact information for approximately 80% of adult Cherokee citizens in the service area. Cherokee citizens who have not used Cherokee Nation health services or did not have any telephone contact information listed in their health care record were not included in the sample frame. The sample was stratified by county of residence with each county resident list randomly sorted. Sample sizes were determined for each county based on a 95% confidence level and 80% power for identifying smoking prevalence. Sample sizes ranged by county (275 –311) with a total goal of n=4,114. The survey sample size of 4,114 was not met because some counties ran out of names before reaching the requisite number of surveys. Even after calling 100% of individuals from two counties within the sample frame, the target sample sizes for those two counties were not met. Accordingly 4,019 (20% of those contacted) Cherokee citizens were surveyed.

In order to produce population estimates of tobacco-related behaviors, the data was weighted to better represent the population of interest. One step post-stratification approach was used for weighting the data because there was only age and gender information for respondents and non-respondents available in the population frame [22]. The strata for this survey were built by using a combination of county, gender and categorized age (ages 18–35, 35–55 and 55+) variables. Prior to forming the strata, hot-deck imputation was used to impute missing

values (less than 10% and assumed missing at random) in the respondents' survey file for age and gender variables. Missing variables were imputed to reduce nonresponse error and improve efficiency and hot-deck imputation was used due to its practical advantages [23–24].

Outcome Variable: Household Smoking Ban

Our survey asked, "What rules do you have about smoking inside your home?" Responses included "smoking is not allowed anywhere or at any time inside the home," "smoking is allowed in some places or at sometimes inside the home," "smoking is allowed everywhere and at any time inside the home," "don't know/not sure," and "refuse to answer." Those who responded "smoking is not allowed anywhere or at any time inside the home" were considered to have a complete household smoking ban and this category served as the referent. Those who responded "smoking is allowed in some places or at sometimes inside the home" were considered to have a partial household smoking ban. Those who responded "smoking is allowed everywhere and at any time inside the home" were considered to have no household smoking ban. Individuals who responded "don't know/not sure" or "refuse to answer" were excluded from this study (n= 210).

Independent Variables: Demographic Characteristics

Age at the time of survey was categorized in completed years as 18–34, 35–64, and ≥65 (referent). *Gender* of respondent was categorized as male or female (referent). *Education level* was defined as highest level of school completed and was categorized as <high school diploma/GED, high school graduate/GED, some college (no degree) and technical degree/college degree or higher (referent). *Household income* was defined as annual household income from all sources categorized as $0-$15,000, $15,001-30,000, $30,001-$45,000, missing, and ≥$45,001 (referent). *Presence of children* was defined as having one or more children aged ≤17 years living in the household and was categorized as no and yes (referent).

Commercial and Ceremonial Tobacco Use

Respondent smoking status was based on the lifetime number of cigarettes smoked and current use of cigarettes; it was categorized as current smoker (≥100 cigarettes in lifetime and cigarette user daily or some days), former smoker (≥100 cigarettes in lifetime and current nonuser), and never smoker (<100 cigarettes in lifetime) (referent). *Household Smoking Status* was defined as presence of one or more current smokers, other than respondent, living in the household and was categorized as yes and no (referent). *Ceremonial tobacco use* (yes/no) was defined as the respondent's use of tobacco for ceremonial, prayer, or traditional reasons, with yes being the referent.

SHS Risk Perception

SHS risk perception was defined as the reported belief about harm to one's health from breathing other people's cigarette smoke. It was categorized as "not harmful," "not very harmful," and "very or somewhat harmful" (referent).

Health Variables

Overall health was defined as respondents' self-report of poor, fair and good to excellent health (referent). *Seen by a healthcare provider* was a yes/no variable defined by respondents' self-report of being seen by a doctor, nurse, therapist, or counselor to get a checkup or care within the past 12 months, with yes being the referent.

Covariates

Due to potential confounding issues, we included the following covariates in the analysis. *Workplace indoor smoking policies* was defined as policies regarding smoking indoors at employment categories were "allowed anywhere/anytime," "allowed in some areas/some time," and "not allowed anywhere/anytime" (referent). *Smokeless tobacco use* (yes/no) was defined as the use of chewing/spit tobacco and/or snuff/dip tobacco every day or some days, with no as referent.

Statistical Analysis

We present descriptive statistics (count and percentage) to summarize the data, examining the sample overall and as stratified by demographics, smoking status, and health-related variables. We reported prevalence estimates together with an exact 95% confidence interval. For all categorical dependent variables, we conducted group comparisons using chi-square test or Fisher's exact test for cell sizes <5. We first dichotomized the outcome variable into partial/no household smoking ban and complete household smoking ban. We conducted a binary logistic regression analysis to identify independent variables (demographic, commercial and ceremonial tobacco use, SHS risk perception and overall health) that might be associated with partial/no household smoking bans. We then separated the outcome variable into three categories (complete ban, partial ban, and no ban) in order to conduct multinomial logistic regression analyses to assess characteristics associated with partial and no household smoking bans with complete household smoking ban as the referent category. Next, we controlled for workplace indoor smoking policies, and smokeless tobacco use in all logistic regression analyses. The independent variables were analyzed for potential multicollinearity issues and no issues were found. We conducted all analyses using the SAS software (version 9.3, Cary, NC). A two-sided p-value of <0.05 was used to define statistical significance.

Results

Description of Study Participants

Approximately 5% of the Cherokee citizen adults surveyed (210 of 4,019) had missing household smoking ban information and were excluded from this study, leaving a total of 3,809 individuals. Table 1 presents the demographic, tobacco use, SHS risk perception and overall health characteristic information of the study population. Nearly half of the respondents were aged between 35 and 64 years. A majority reported at least a high school education and slightly more than a quarter had a yearly household income equal to or greater than $45,000. Close to half of respondents reported at least one child living in the household. About half of respondents were never smokers, another quarter were former smokers, and

the rest were current smokers. The majority of respondents indicated that no one else living within the household was a smoker. Approximately 6% of respondents reported using tobacco ceremonially. Finally, the large majority (84.2%) of respondents reported a complete household smoking ban, 7.0% reported at least a partial ban, and 8.9% reported no ban.

Household Smoking Bans

As shown in table 2, significant associations ($p < 0.001$) appeared between household smoking bans and most of the demographic and health variables. Individuals with more education and higher incomes were more likely to have complete household smoking bans than their counterparts ($p < 0.001$). Households with smokers other than the respondent were less likely to have a complete ban compared to households with no smokers ($p < 0.001$). Individuals who used tobacco ceremonially were less likely to have a complete ban compared to those who did not use tobacco ceremonially ($p < 0.001$). Individuals who thought SHS was “very or somewhat harmful” were more likely to have a complete ban compared to either of the groups that believed SHS was “not very harmful” or “not harmful” ($p < 0.001$). Additionally, individuals reporting good to excellent health were significantly more likely to have a complete household smoking ban when compared to those with fair or poor health ($p < 0.001$). Finally, households with children were more likely to have a complete household smoking ban than those without ($p < 0.001$).

Binary Logistic Regression

In table 3, household smoking ban was dichotomized (complete ban vs. partial/no ban) for the analysis. The only variable that was not significantly associated with household smoking bans was ceremonial tobacco use (aOR = 1.01; 95% CI = 0.89, 1.16). Lower levels of education, lower income levels, households with smokers other than the respondent, and a belief that SHS was not harmful were at significantly greater odds of partial/no bans compared to their counterparts. While current smokers were at greater odds (aOR = 2.71; 95% CI = 2.51, 2.94) of having a partial/no ban compared to never smokers, former smokers had significantly lesser odds (aOR = 0.72; 95%CI 0.66, 0.81) of a partial/no ban as compared to never smokers. Additionally, those not seen by a healthcare provider within the last year were at greater odds (aOR = 2.08; 95%CI = 1.92, 2.26) of having a partial or no ban compared to those who had been seen. Lastly, homes without resident children increased odds (aOR = 2.46; 95%CI = 2.29, 2.65) of having a partial/no ban compared to homes that did have children.

Multinomial Logistic Regression

Table 4 presents the multinomial logistic regression (three separate categories of household smoking ban) with complete household smoking ban used as the referent category.

Partial ban vs Complete ban—Respondents aged 65 years or older were at greater odds of having a partial rather than a complete ban compared to 18–34 year olds (aOR = 2.35; 95%CI = 1.85, 2.99). Individuals with incomes between $15,001 and $30,000 (aOR = 3.13 95%CI = 2.73, 3.59) and between $30,001 and $45,000 were at greater odds (aOR = 1.28; 95%CI = 1.10, 1.49) of a partial ban compared to those in the highest income group. However, those with an income less than $15,000 showed significantly lesser odds of having

a partial ban compared to those in the highest income group (aOR = 0.08; 95%CI = 0.03, 0.21). Individuals who used tobacco ceremonially had lesser odds of a partial ban when compared to those who did not use it ceremonially (aOR = 0.55; 95%CI = 0.472, 0.641). Individuals with fair health (aOR = 1.30; 95%CI = 1.12, 1.50) and poor health (aOR = 2.71; 95%CI = 1.96, 3.75) were at greater odds of having a partial ban compared to those in good to excellent health.

No ban vs Complete ban—Individuals aged 34 to 64 years (aOR = 3.01; 95%CI =2.71, 3.34) and those aged 65 years or older (aOR = 4.58; 95%CI = 3.70, 5.66) were at significantly greater odds of having no ban rather than a complete ban when compared to individuals aged 18–34 years. Participants with a high school education or a GED had greater odds of having no ban compared to those with a technical/college degree (aOR = 1.53; 95%CI = 1.37, 1.67). Individuals in poor health were at greater odds of having no ban compared to those in good to excellent health (aOR = 8.66; 95%CI = 6.75, 11.10).

Discussion

The current study found that approximately 84% of Cherokee households have a complete household smoking ban, similar to recent national and Oklahoma state data for the general population [25–26]. A large, national population based survey found that nearly 84% of U.S. households reported a complete household smoking ban in 2011[26]. Further, 79% of American Indians living in northeastern Oklahoma–a region that includes the boundaries of the Cherokee Nation and a concentrated population of Cherokees–reported a household smoking ban compared to nearly 84% of all Oklahoma adults [25]. Although the prevalence of complete household smoking bans found in this study are comparable to state and national data, it is still important to study household smoking bans because nearly 16% of the population are still exposed to household SHS.

Consistent with previous studies, several factors were related to complete household smoking bans. Lower household income and education level, less awareness of SHS harms, a resident smoker, and no children in the home were each significantly associated with lower odds of having a complete ban as compared to either no ban or only a partial ban. Notably, former smokers had significantly greater odds of having a complete smoking ban, after adjusting for confounding variables, than never smokers [4–12]. This suggests the possibility that former smokers may try to maintain cessation efforts by implementing household smoking bans.

Our analysis evaluated variables that other studies have not assessed, including healthcare utilization. Results showed that individuals who had been seen by a healthcare provider within the previous 12 months were at greater odds of having a complete household smoking ban rather than a partial/no ban compared to all other participants. It is possible that these individuals received information about the benefits of complete bans during healthcare visits, an interpretation that would recommend clinic-based interventions. In addition, our study—which we believe to be the first to evaluate ceremonially tobacco use and its association with household smoking bans—found that ceremonial tobacco use was not significantly associated with complete household smoking bans. Thus, there is no reason to

conclude that ceremonial tobacco acts as either a protective or a risk factor in regard to household smoking bans.

Ours is the first study to separately evaluate factors associated with partial and no bans when compared to complete household smoking bans. While most variables were significantly associated with household smoking bans in the logistic and multinomial logistic regressions, there were notable differences between the regression models. For instance, 35–64 year olds were significantly at greater odds of either a partial ban or no ban rather than a complete ban, compared to 18–34 year olds. However, when analyzing predictors of partial bans and predictors of no bans separately, these associations were not sustained. When only evaluating indicators of partial bans, 35–64 year olds showed insignificant lower odds of a partial ban rather than a complete ban compared to 18–34 year olds. Yet, 35–64 year olds were at significantly greater odds of having no ban rather than a complete ban compared to 18–34 year olds. These types of changes in the direction of association and significance of variables in the different regression models were also present within categories of education, household income, ceremonial tobacco use, and overall health.

While future studies should confirm the associations we identified, these findings suggest that there may be important distinctions between individuals who have partial household smoking bans and those with none. Accordingly, public health practitioners wanting to increase the prevalence of complete household smoking bans may need to develop interventions specifically for those who are more likely to have partial bans and those who are more likely to have no bans.

This project has limitations. We estimated household smoking ban prevalence based on a survey of individuals and thus cannot determine if two or more of our participants lived within the same household; if this were true for a large number of respondents, it would artificially increase the apparent prevalence of household smoking bans. In addition, the 20% response rate to our telephone survey, while comparable to that of surveys conducted in the general U.S. population, may have affected the results [27]. To compensate for sampling issues, the Cherokee Nation American Indian Adult Tobacco Survey was weighted for participants' age and gender, a strategy shown to improve estimates [27]. This survey was also limited by the exclusion of individuals without telephone contact information contained within the electronic medical database. While we are unsure of the exact number of individuals who may have been excluded, we are confident that it was not a large number that would have significantly altered the results of our study.

The data set does not include some potential confounders–such as electronic cigarette use, availability of outdoor space, smoking status of visitors to the home, or participants' marital status. Further, we asked about ceremonial tobacco use only in general terms; this was a deliberate choice that in favor of sensitivity toward community values about the privacy of spiritual practice. Since ceremonial tobacco use is private and many AIs prefer not to discuss this practice, the prevalence of ceremonial tobacco use may have been underestimated. Finally, because data collection focused on a single tribe, data generated from this study cannot be generalized to other tribes or urban AI communities. We nonetheless expect that

our work will invite special interest from researchers working to reduce SHS exposure in other tribal populations.

This study's limitations must be weighed against its several strengths. In particular, it examined data from a large, population-based survey of more than 4,000 respondents. It was the first study to describe the prevalence of household smoking bans among Cherokee households, as well as the first to evaluate indicators of household smoking bans among any population of AIs and to separately evaluate indicators of partial household smoking bans and no household smoking bans.

In conclusion, the current study identified several correlates for household smoking bans among AIs. The results may provide insight for the development of appropriate interventions for individuals and households that do not have a complete household smoking ban. Specifically, these results suggest that there may be important differences between households with partial bans and households with no bans. Therefore, interventions may need to be tailored separately for households with partial bans and households with no bans. Future research should be done to further explore these associations and to better quantify the impact of these factors on household smoking bans.

Acknowledgments

Funding

This study was supported by the National Institute of Minority Health and Health Disparities (1 P20 MD006871-01). Additional support was provided by the Native Investigator Development program through funding from the National Institute on Aging (4P30AG015292-20). The fourth author wishes to acknowledge the partial funding provided by National Institutes of Health, National Institute of General Medical Sciences (1 U54GM104938), an IDeA-CTR to the University of Oklahoma Health Sciences Center.

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Table 1

Demographic and Characteristics of Cherokee Adult Citizens Participating in the 2014 Cherokee Nation American Indian Adult Tobacco Survey

Characteristic	Total N (%)
Age (In Years)	
18–34	961 (40.2%)
35–64	2175 (48.9%)
≥65	673 (10.9%)
Sex	
Male	1611 (49.4%)
Female	2198 (50.6%)
Education Level	
< High school diploma/GED	307 (8.5%)
High school graduate/GED	1355 (36.2%)
Some college (no degree)	750 (19.7%)
Technical/college degree or higher	1346 (34.9%)
Household Income	
$0-$15,000	301 (7.4%)
$15,001-$30,000	513 (13.5%)
$30,001-$45,000	451 (11.7%)
≥$45,001	1011 (27.2%)
Missing	1533 (40.1%)
Respondent Smoking Status	
Current smoker	773 (22.0%)
Former smoker	1009 (23.9%)
Never smoker	2027 (54.1%)
Household Smoking Status	
Yes	1301 (36.9%)
No	2451 (63.1%)
Ceremonial Tobacco Use	
Yes	202 (6.3%)
No	3549 (93.7%)
SHS Risk Perception	
Very or somewhat harmful	3579 (96.4%)
Not very harmful	86 (2.5%)
Not harmful	46 (1.1%)
Overall Health	
Good to excellent health	2963 (81.7%)
Fair health	622 (14.1%)
Poor health	214 (4.2%)
Seen by Healthcare Provider	
Yes	3202 (81.5%)

Characteristic	Total N (%)
No	564 (18.5%)
Household Smoking Ban	
Complete ban	3185 (84.2%)
Partial ban	256 (7.0%)
No ban	368 (8.9%)
Presence of Children in Household	
Yes	1356 (44.1%)
No	2312 (55.9%)
Workplace Indoor Smoking Policies	
Allowed anywhere/anytime	65 (4.0%)
Allowed some places/sometime	141 (9.5%)
Not allowed anywhere anytime	1377 (86.6%)
Smokeless Tobacco Use	
Yes	279 (9.4%)
No	3493 (89.6%)

Table 2

Demographic and Characteristics by Household Smoking Ban Status among Adult Cherokee Citizens Participating in the 2014 Cherokee Nation American Indian Adult Tobacco Survey

Characteristic	Complete ban N (%)	Partial Ban N (%)	No Ban N (%)	P value N (%)
Age (In Years)				<0.001
18–34	1766 (86.5%)	146 (7.3%)	263 (6.2%)	
35–64	838 (82.1%)	68 (6.7%)	55 (11.3%)	
≥65	581 (84.9%)	42 (7.4%)	50 (7.7%)	
Sex				<0.001
Male	1327 (83.2%)	112 (7.3%)	172 (9.5%)	
Female	1858 (85.1%)	144 (6.7%)	196 (8.2%)	
Education Level				<0.001
< High school diploma/GED	221 (71.9%)	27 (11.1%)	59 (17.0%)	
High school graduate/GED	1008 (80.6%)	113 (9.2%)	154 (10.2%)	
Some college (no degree)	641 (86.8%)	49 (5.8%)	60 (7.4%)	
Technical/college degree or higher	1194 (89.2%)	66 (4.5%)	86 (6.3%)	
Household Income				<0.001
$0-$15,000	210 (71.5%)	25 (7.2%)	66 (21.3%)	
$15,001-$30,000	409 (79.9%)	47 (10.8%)	57 (9.3%)	
$30,001-$45,000	383 (87.0%)	28 (5.6%)	40 (7.3%)	
≥$45,001	910 (90.4%)	49 (5.1%)	52 (4.5%)	
Missing/Unknown	1253 (82.8%)	104 (7.4%)	148 (9.8%)	
Respondent Smoking status				<0.001
Current smoker	440 (62.0%)	109 (14.2%)	224 (23.7%)	
Former smoker	896 (89.7%)	59 (5.7%)	54 (4.6%)	
Never smoker	1849 (90.7%)	88 (4.6%)	90 (4.7%)	
Household Smoking Status				<0.001
Yes	817 (66.0%)	181 (14.1%)	303 (19.9%)	
No	2322 (94.7%)	73 (3.0%)	56 (2.3%)	
Ceremonial Tobacco Use				<0.001
Yes	131 (62.9%)	27 (13.3%)	44 (23.8%)	
No	3010 (85.6%)	244 (6.6%)	315 (7.8%)	
				<0.001
SHS Risk Perception				
Very or somewhat harmful	3043 (85.2%)	230 (6.7%)	306 (8.1%)	
Not very harmful	54 (66.3%)	8 (10.2%)	24 (23.5%)	
Not harmful	21 (48.8%)	9 (19.4%)	16 (31.8%)	
Overall Health				<0.001
Good to excellent health	2548 (86.2%)	171 (6.0%)	244 (7.8%)	
Fair health	478 (77.0%)	64 (11.3%)	80 (11.7%)	
Poor health	151 (67.6%)	21 (12.9%)	42 (19.6%)	
Seen by Healthcare Provider				<0.001

Characteristic	Complete ban N (%)	Partial Ban N (%)	No Ban N (%)	P value N (%)
Yes	2701 (85.0%)	208 (6.9%)	293 (8.1%)	
No	448 (80.0%)	45 (7.7%)	71 (12.1%)	
Presence of Children in Household				<0.001
Yes	1181 (87.5%)	148 (7.7%)	269 (4.8%)	
No	1895 (81.8%)	96 (6.4%)	79 (11.9%)	
Workplace Indoor Smoking Policies				<0.001
Allowed anywhere/anytime	45 (77.0%)	6 (8.9%)	14 (14.1%)	
Allowed some places/sometime	104 (77.3%)	17 (11.6%)	17 (11.0%)	
Not allowed anywhere anytime	1224 (89.9%)	58 (4.2%)	78 (5.9%)	
Smokeless Tobacco Use				<0.001
Yes	227 (83.6%)	16 (5.3%_	36 (11.1%)	
No	2947 (84.2%)	236 (7.1%)	331 (8.7%)	

Table 3

Multiple Logistic Regression Model Predicting Household Smoking Ban Status among Adult Citizens Participating in the 2014 Cherokee Nation American Indian Adult Tobacco Survey

Characteristics	Partial Ban/No Ban	
	OR (95% CIs)	aOR (95% CIs)
Age (In Years)		
18–34	Referent	Referent
35–64	1.40 (1.35, 1.216)	1.71 (1.58, 1.84)
≥65	1.14 (1.07, 1.22)	3.12 (2.64, 3.69)
Sex		
Male	1.15 (1.11, 1.19)	1.38 (1.28, 1.49)
Female	Referent	Referent
Education Level		
< High school diploma/GED	3.23 (3.04, 3.43)	1.07 (0.92, 1.26)
High school graduate/GED	1.99 (1.90, 2.08)	1.57 (1.45, 1.71)
Some college (no degree)	1.26 (1.20, 1.34)	0.90 (0.81, 1.00)
Technical/college degree or higher	Referent	Referent
Household Income		
$0-$15,000	3.76 (3.52, 4.03)	3.71 (3.17, 4.34)
$15,001-$30,000	2.37 (2.23, 2.52)	2.73 (4.43, 3.07)
$30,001-$45,000	1.40 (1.31–1.51)	1.50 (1.33, 1.68)
≥$45,001	Referent	Referent
Missing/Unknown	1.96 (1.86, 2.06)	1.42 (1.30, 1.56)
Respondent Smoking Status		
Current smoker	5.95 (5.71, 6.20)	2.71 (2.51, 2.94)
Former smoker	1.11 (1.06, 1.18)	0.72 (0.66, 0.81)
Never smoker	Referent	Referent
Household Smoking Status		
Yes	5.81 (5.59, 6.03)	5.82 (5.40, 6.27)
No	Referent	Referent
Ceremonial Tobacco Use		
Yes	Referent	Referent
No	0.29 (0.27, 0.30)	1.01 (0.89, 1.16)
SHS Risk Perception		
Very or somewhat harmful	Referent	Referent
Not very harmful	2.92 (5.34, 6.83)	1.52 (1.29, 1.79)
Not harmful	6.039 (5.34–6.83)	1.25 (0.86, 1.82)
Overall Health		
Good to excellent health	Referent	Referent
Fair health	1.88 (1.79, 2.00)	0.87(0.78–0.97)
Poor health	3.01 (2.81, 3.23)	4.63 (3.74, 5.72)
Seen by Healthcare Provider		

Characteristics	Partial Ban/No Ban	
	OR (95% CIs)	aOR (95% CIs)
Yes	Referent	Referent
No	1.40 (1.34, 1.46)	2.08 (1.92, 2.26)
Presence of Children		
Yes	Referent	Referent
No	1.55 (1.50, 1.61)	2.46 (2.29, 2.65)

Table 4

Multinomial Logistic Regression Models Predicting Household Smoking Ban Status among Adult Citizens Participating in the 2014 Cherokee Nation American Indian Adult Tobacco Survey

Characteristics	Partial Ban*		No Ban*	
	OR (95%CIs)	aOR (95% CIs)	OR (95%CIs)	aOR (95% CIs)
Age (In Years)				
18–34	Referent	Referent	Referent	Referent
35–64	0.97 (0.92, 1.02)	0.95 (0.86–1.05)	1.27 (1.16, 1.38)	3.01 (2.71, 3.34)
≥65	1.04 (0.95, 1.13)	2.35 (1.85, 2.99)	1.91 (1.81, 2.01)	4.58 (3.70, 5.66)
Sex				
Male	1.11 (1.06, 1.17)	1.66 (1.50, 1.84)	1.18 (1.13, 1.24)	1.21 (1.09, 1.34)
Female	Referent	Referent	Referent	Referent
Education Level				
< High school diploma/GED	3.04 (2.78, 3.32)	1.40 (1.13, 1.74)	3.37 (3.13, 3.63)	0.802 (0.64, 1.00)
High school graduate/GED	2.24 (2.10, 2.39)	1.51 (1.34, 1.70)	1.80 (1.70, 1.91)	1.53 (1.37, 1.67)
Some college (no degree)	1.33 (1.22, 1.44)	1.12 (1.00, 1.32)	1.22 (1.13, 1.31)	0.67 (0.57, 0.78)
Technical/college degree or higher	Referent	Referent	Referent	Referent
Household Income				
$0-$15,000	1.80 (1.61, 2.00)	0.08 (0.03, 0.21)	5.97 (5.50, 6.49)	11.19 (9.27, 13.50)
$15,001-$30,000	2.40 (2.22, 2.60)	3.13 (2.73, 3.59)	2.33 (2.14, 2.54)	1.72 (1.43,−2.07)
$30,001-$45,000	1.16 (1.05, 1.28)	1.28 (1.10, 1.49)	1.68 (1.53, 1.85)	1.79 (1.53, 2.10)
≥$45,001	Referent	Referent	Referent	Referent
Missing/Unknown	1.59 (1.49–1.71)	0.69 (0.60, 0.79)	2.37 (2.21, 2.53)	2.67 (2.35, 3.02)
Respondent Smoking Status				
Current smoker	4.52 (4.27, 4.79)	2.63 (2.35, 2.94)	7.33 (6.95, 7.73)	3.00 (2.70, 3.32)
Former smoker	1.26 (1.18, 1.35)	0.83 (0.72, 0.96)	0.97 (0.90, 1.05)	0.66 (0.57, 0.77)
Never smoker	Referent	Referent	Referent	Referent
Household Smoking Status				
Yes		5.90 (4.90, 5.97)		5.25 (4.78, 5.78)
No	Referent	Referent	Referent	Referent
Ceremonial Tobacco Use				
Yes	Referent	Referent	Referent	Referent
No	0.37 (0.34–0.40)	2.14 (1.72, 2.66)	0.242 (0.266–0.258)	0.550 (0.472–0.641)
SHS Risk Perception				
Very or somewhat harmful	Referent	Referent	Referent	Referent
Not very harmful		1.32 (1.05, 1.66)		2.03 (1.69, 2.44)
Not harmful		1.82 (1.09, 3.04)		1.319 (0.837–2.080)
Overall Health				
Good to excellent health	Referent	Referent	Referent	Referent
Fair health	2.13 (2.00, 2.27)	1.30 (1.12, 1.50)	1.68 (1.59, 1.79)	0.59 (0.51, 0.69)
Poor health	2.75 (2.49, 3.04)	2.71 (1.96, 3.75)	3.20 (2.94, 3.49)	8.66 (6.75, 11.10)

Characteristics	Partial Ban*		No Ban*	
	OR (95%CIs)	aOR (95% CIs)	OR (95%CIs)	aOR (95% CIs)
Seen by Healthcare Provider				
Yes	Referent	Referent	Referent	Referent
No	1.19 (1.12, 1.27)	1.63 (1.45, 1.83)	1.57 (1.49, 1.66)	2.58, (2.32, 2.86)
Presence of Children				
Yes	Referent	Referent	Referent	Referent
No	0.88 (0.84, 0.93)	1.25 (1.13,1.38)	2.63 (2.50, 2.79)	5.36 (4.79, 5.99)

*Reference category: Complete household ban

**The following confounding variables were included in the models but not in the table: workplace indoor smoking policies, and smokeless tobacco use