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The association of California's Proposition 56 tobacco tax increase with smoking behavior across racial and ethnic groups and by income

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ABSTRACT (250/250)

Introduction. On April 1, 2017, California Proposition 56 (Prop 56) was implemented, increasing the excise tax on cigarettes by \$2/pack. This study compares the association of Prop 56 with smoking prevalence and smoking intensity across racial/ethnic groups, further examining distinctions across income subgroups within each racial/ethnic group.

Methods. The study used pooled cross-sectional data from the 2012-2018 California Behavioral Risk Factor Surveillance System. We examined two outcomes: current smoking prevalence and smoking intensity conditional on current smoking. A two-part econometric model was used to estimate the association of Prop 56 with smoking prevalence and intensity using multiple logistic regression and multiple linear regression, respectively. The two-part model was run separately for all adults (full sample) and each racial/ethnic group. Within each racial/ethnic group, we ran stratified analyses by income subgroups.

Results. The results indicated that Prop 56 was negatively associated with smoking prevalence among full-sample, Hispanic, White, and African American adults; and negatively associated with smoking intensity among full-sample and White smokers. Stratified analyses by race/ethnicity and income showed that Prop 56 was negatively associated with smoking prevalence among low-income full-sample and White adults and among middle-income smokers in the full, Hispanic, White, African American, and Asian samples. Prop 56 was negatively associated with smoking intensity among middle-income Hispanic and high-income White smokers. The association between Prop 56 and smoking intensity was positive among high-income African American smokers.

Conclusion. Prop 56 was associated with a reduction in smoking prevalence across multiple racial/ethnic groups, particularly within the low- and middle-income subgroups.

POLICY IMPLICATIONS (Word count: 97/100)

Our findings indicate that the reduction in smoking prevalence immediately following the implementation of California Proposition 56 tobacco tax increase was significant across a variety of racial/ethnic groups, particularly low- and middle-income subgroups. We found differential responses in smoking prevalence across income groups among Whites but not among racial/ethnic minorities. We found no evidence of any significant association between Proposition 56 and smoking intensity among minorities and economically vulnerable populations, except for middle-income Hispanics. Researchers, policymakers, and advocates should consider additional merits of targeted, community-based, non-economic tobacco control interventions in reaching low- and middle-income groups within racial/ethnic minorities.

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INTRODUCTION

The United States (U.S.) has experienced a marked decline in smoking prevalence over the past several decades [1,2], with adult smoking prevalence decreasing from 20.9% to 14.0% between 2005 and 2019 [2]. Statewide comprehensive tobacco control programs have been crucial in driving this decline [3]. In 1989, California instituted the first and longest running comprehensive tobacco control program in the nation. Between 1988 and 2017, smoking prevalence among California adults fell by 57.4% [1]. The relative and sustained success of this program is, in part, reflected in the dramatic difference in smoking rates in California and the United States as a whole (17.1% vs. 10.1% in 2017) [1].

Mirroring national trends [2], vulnerable populations in California have not shared equally in these gains. Tobacco-related disparities persist across racial/ethnic groups and by income. Data from the 2016-2017 California Health Interview Surveys indicate that 7.7% of adult respondents with household incomes $\geq 300\%$ of the federal poverty level (FPL) identified as current smokers; comparatively, smoking prevalence was more than twice as high among those with incomes 0-99% of the FPL (15.8%) [1]. Major discrepancies in adult smoking prevalence were also apparent by race/ethnicity, with prevalence of 7.4%, 10.2%, 11.8%, 17.0%, and 19.1% for Asians or Pacific Islanders, Hispanics, Whites, African Americans, and American Indians, respectively [1].

Economic strategies represent a key component of any comprehensive tobacco control program [3]. Numerous studies have demonstrated the effectiveness of raising cigarette prices in curbing cigarette smoking prevalence and intensity [3,4]; however, important questions remain, particularly related to differences in price effects across racial/ethnic and income groups. Only a small body of literature in the U.S. has examined the impact of cigarette price on smoking behavior across different racial/ethnic groups [5-7] and the results are mixed. Dinno and Glanz found little difference in price-responsiveness between White, African American, Asian/Pacific Islander, and American Indian/Aleutian/Eskimo populations [5]. Yao and colleagues' results indicated that Whites

were significantly more price-responsive than African Americans and Hispanics in changing smoking prevalence and intensity [6]. Farrelly and colleagues' findings showed that the total price elasticity of cigarette demand was higher among non-Hispanic African Americans and Hispanics than Whites [7].

The literature exploring the impact of cigarette price on smoking behavior across income groups also shows mixed results. While some studies found that low-income individuals were more responsive to cigarette price increases in reducing cigarette smoking [7-9], other studies found that price-responsiveness did not differ by income level [10-11]. To our knowledge, no study has explored distinctions in price-responsiveness along both race/ethnicity and income dimensions.

On April 1, 2017, California Proposition 56 (Prop 56) was implemented, increasing the excise tax on cigarettes by \$2/pack. A recent study found that Prop 56 was associated with a decrease in adult smoking prevalence among low-income but not high-income Californians [9]. There has been no study investigating differences in the association of Prop 56 across various racial/ethnic groups. The current study compares changes in smoking behaviors immediately following the implementation of Prop 56 among different racial/ethnic groups in California. Within each racial/ethnic group, we further examine distinctions in the association of Prop 56 with smoking behavior by income levels.

METHODS

Data source

We analyzed pooled, cross-sectional data from the 2012-2018 California Behavioral Risk Factor Surveillance System (BRFSS), an ongoing telephone survey conducted annually since 1984 and sponsored by the Centers for Disease Control and Prevention and the California Department of Public Health [12]. Beginning in 2012, the California BRFSS used a dual-frame sampling design with both cell and landline random-digit dial components to collect interviews from a randomly selected

sample that is representative of adult population (aged ≥ 18 years) in the state. The California BRFSS collects detailed information on respondent's sociodemographic characteristics, health conditions, health care access, cigarette smoking behavior (including number of smoking days and number of cigarettes smoked per day), and other health-related risk behaviors. More detailed information about the survey is available elsewhere [13].

Outcome variables

Smoking prevalence. Adults were categorized as current smokers if they reported having smoked at least 100 cigarettes in their lifetime and currently smoke cigarettes every day (daily smokers) or some days (nondaily smokers).

Smoking intensity among current smokers. Smoking intensity was measured using average cigarettes smoked per day (CPD). For daily smokers, we defined CPD as the number of cigarettes they reported typically smoking on any given day. For nondaily smokers, CPD was constructed by multiplying the number of cigarettes typically consumed per day on days when they smoked by the number of days they reported smoking in the past 30 days, and then dividing this product by 30. We logarithmically transformed the CPD variable as the Shapiro-Wilke test indicated that the measure was skewed [9,14]

Explanatory variables

Prop 56 indicator. We created a Prop 56 indicator variable, which equaled one for interviews conducted on or after April 1, 2017 (the first day of implementation of the proposition) and zero otherwise.

Race/ethnicity. We classified respondents into five, mutually exclusive racial/ethnic groups: Hispanics (regardless of race), non-Hispanic Whites, non-Hispanic African Americans, non-Hispanic

Asians, and non-Hispanic Other (hereafter referred to as Hispanics, Whites, African Americans, Asians, and Other).

Income-level indicator. We categorized respondents into four income groups: low-income ($\leq 130\%$ of the FPL), middle-income (131%-249% of the FPL), high-income ($\geq 250\%$ of the FPL), and unknown income, based on the poverty status variable available in the California BRFSS data. The poverty status was measured by the ratio of self-reported annual household income to the federal poverty line [15], taking household size into consideration. We selected 130% of the FPL as our low-income threshold as this is the cutoff used for the federal Supplemental Nutrition Assistance Program (SNAP) [16]. Within our study sample, 23.7% of respondents fell below this cut-off (approximately the lowest quartile) (see Supplemental Table 1). We chose 250% FPL as our high-income threshold as this was the highest income category consistently available in the 2012-2018 BRFSS data

Many respondents did not report their household incomes. A comparison of the distribution of the final study sample by smoking status and explanatory variables between those with reported income and those without reported income indicated significant differences between the two groups (Supplemental Table 2). We retained those without reported income in our analysis and categorized them as the “unknown income” group, which comprised 15.8% of our final study sample (see Supplemental Table 1).

Other explanatory variables. We controlled for a number of sociodemographic characteristics, including gender (male and female), age (21-34, 35-49, 50-64, and 65+), educational attainment (<high school degree, high school degree, some college, and college degree and above), employment status (employed, unemployed, and not in labor force), and marital status (married, unmarried couple, divorced/separated/widowed, and never married). Additionally, we controlled for other individual-level characteristics and risk behaviors that have been found as correlates of smoking behavior, including health insurance status (private insurance, Medicare, MediCal, other

form of insurance, and uninsured) [17-18] and obesity status (normal weight, overweight, and obesity, defined by body mass index <25, 25-30, and ≥ 30 kg/m², respectively) [17,19]. Lastly, all models include a time trend variable equal to the value of survey year.

Study sample

This study focused on California adults aged 21 and older. We excluded respondents younger than 21 years because California's Tobacco 21 law raised the minimum age for tobacco sales from 18 to 21 years old effective June 9, 2016.

The 2012-2018 California BRFSS data contain 75,704 respondents aged 21+. After excluding those with incomplete information for the outcome variables (6,534 respondents or 8.6% of the original sample) and explanatory variables (additional 8,313 respondents or 11.0% of the original sample), we arrived at our final study sample of 60,857 adults (hereafter referred to as the full sample), including 17,391 Hispanics, 34,260 Whites, 3,033 African Americas, 4,295 Asians, and 1,878 Others (Table 1). Approximately one-fourth of the full sample were interviewed after the implementation of Prop 56 on April 1, 2017; of them, 4,807 were Hispanics, 7,375 were Whites, 754 were African Americas, and 1,162 were Asians. Basic descriptive statistics for the full study sample and for each racial/ethnic group are available in Supplemental Table 1.

Statistical analysis

We conducted two main analyses separately for the full sample and each of the four major racial/ethnic groups (Hispanics, Whites, African Americas, and Asians). First, we conducted bivariate analyses to examine differences in smoking prevalence and intensity across the Prop 56 indicator and other categorical explanatory variables. Second, we conducted a two-part econometric model analysis to examine the association of Prop 56 with smoking behavior. This model was originally

developed by Cragg [20] to analyze data with excess zeros and has been widely employed by economists to analyze how cigarette consumption responds to cigarette price changes [4,6-7,19,21]. In the first part of the two-part model, a multiple logistic regression was used to estimate the likelihood of being a current smoker among adults (smoking prevalence model). In the second part of the two-part model, a multiple linear regression was used to estimate smoking intensity conditional upon being a current smoker (smoking intensity model). Both parts of the model were run as a function of the Prop 56 indicator, the income-level indicator, and other explanatory variables. In the analysis for the full sample, the model also controlled for the race/ethnicity variable. To further examine distinctions in the association of Prop 56 with smoking behaviors across both racial/ethnic and income dimensions, we ran the two-part econometric model as a function of the Prop 56 indicator and other explanatory variables separately for low-, middle-, and high-income subgroups within each major racial/ethnic group.

Moreover, we conducted two secondary analyses to investigate whether the associations of Prop 56 with smoking prevalence and smoking intensity were significantly different across four major racial/ethnic groups and three known income groups. In the first secondary analysis, among the full study sample, we tested whether the associations differed significantly across racial/ethnic groups by adding the interaction terms between the Prop 56 indicator and the race/ethnicity variables to the two-part model. In the second secondary analysis, among each of the four racial/ethnic groups, we tested whether the associations differed significantly across low-, middle-, and high-income groups by adding the interaction terms between the Prop 56 indicator and the income-level indicator. The p-value for the interaction term provided a significance test for the differential associations.

All analyses were conducted using Stata 14 (StataCorp, College Station, TX), incorporating the California BRFSS sampling weights to account the BRFSS complex survey design and ensure that the estimates are representative of the California adult population by age, gender, and race/ethnicity. A two-tailed p-value <0.05 was considered statistically significant.

RESULTS

Unadjusted smoking prevalence

Mean smoking prevalence among all adults (full sample) was 9.5% (Table 1). Smoking prevalence varied by race/ethnicity: 8.6% for Hispanics, 10.1% for Whites, 12.3% for African Americans, and 5.6% for Asians. Within the full sample and among all racial/ethnic group except Asians, low-income adults had the highest smoking prevalence among all income groups. Among all the subgroups stratified by both race/ethnicity and income, low-income Whites had the highest smoking prevalence (23.3%) and high-income Asians had the lowest smoking prevalence (4.4%). Bivariate analyses indicated that compared to the pre-implementation period, smoking prevalence was significantly lower in the post-implementation period for the full sample, Hispanics, Whites, African Americans, and Asians (data not shown).

Unadjusted smoking intensity

On average, full-sample smokers consumed 8.6 cigarettes per day (CPD) (Table 1). Across race/ethnicity, CPD was lowest among Hispanic smokers (5.4 cigarettes) and highest among White smokers (11.0 cigarettes). Among full-sample smokers, the high-income group consumed more CPD than other income groups. Among Hispanic and African American smokers, CPD was highest among those with unknown income. Among White and Asian smokers, the low-income group had the highest average CPD. Among all the subgroups stratified by both race/ethnicity and income, low-income White smokers had the highest CPD (12.3 cigarettes) and low-income Hispanic smokers had the lowest CPD (4.7 cigarettes). Bivariate analyses indicated that average CPD was significantly lower

in the post-implementation period compared to the pre-implementation period among full-sample, Hispanic, White, and Asian smokers (data not shown).

Association of Prop 56 with smoking prevalence

Multiple logistic regression results show a negative and significant association between Prop 56 and smoking prevalence among the full sample (AOR:0.59; 95% CI:0.49,0.72), Hispanics (AOR:0.66; 95% CI:0.47,0.91), Whites (AOR:0.62; 95% CI:0.47,0.81), and African Americans (AOR:0.47; 95% CI:0.23,0.94) (Table 2), indicating that the odds of being a current smoker in the post-implementation period were 0.59, 0.66, 0.62, and 0.44 times the odds of being a current smoker in the pre-implementation period among these respective groups. Based on the estimated models, we derived the predicted values of smoking prevalence, holding other covariates at the mean, for the pre- and post-implementation periods. The difference between these two predicted values, namely the average marginal effect, indicated that, compared to the pre-implementation period, the predicted smoking prevalence in the post-implementation period declined from 8.2% to 5.0% (3.2 percentage points) for the full-sample, 7.7% to 5.2% (2.5 percentage points) for Hispanics, 8.1% to 5.2% (3.0 percentage points) for Whites, 12.2% to 6.1% (6.1 percentage points) for African Americans, and 4.2% to 2.5% (1.8 percentage points) for Asians. The results from the secondary analysis for the full sample showed that the interaction terms between the Prop 56 indicator and the race/ethnicity variable were not statistically significant (Supplemental Table 3), indicating that there was no statistically significant difference in the association between Prop 56 and smoking prevalence across any pairs of racial/ethnic groups.

Association of Prop 56 with smoking intensity

The results from multiple linear regression analyses among current smokers indicated a negative association between Prop 56 and smoking intensity among full-sample smokers (Coeff.: -0.28; 95% CI: -0.51, -0.06) and White smokers (Coeff.: -0.34; 95% CI: -0.59, -0.08) (Table 3), indicating that CPD among these two groups decreased by 1.3 ($=\exp(0.28)$) cigarettes per day and 1.4 ($=\exp(0.34)$) cigarettes per day, respectively, in the post-implementation period. Secondary analyses for the full sample showed that the interaction terms between the Prop 56 indicator and the race/ethnicity variable were not statistically significant, indicating that there was no differential association of Prop 56 with smoking intensity across racial/ethnic groups (Supplemental Table 4).

Association of Prop 56 with smoking behavior across income subgroups within each racial/ethnic group

Prop 56 was associated with a significant drop in smoking prevalence among low-income full-sample adults (AOR: 0.47; 95% CI: 0.34, 0.65), low-income Whites (AOR: 0.40; 95% CI: 0.24, 0.65), middle-income full-sample adults (AOR: 0.42; 95% CI: 0.28, 0.63), middle-income Hispanics (AOR: 0.56; 95% CI: 0.31, 1.00), middle-income Whites (AOR: 0.39; 95% CI: 0.22, 0.71), middle-income African Americans (AOR: 0.21; 95% CI: 0.05, 0.90), and middle-income Asians (AOR: 0.26; 95% CI: 0.07, 0.97) (Table 4). Prop 56 was associated with a significant drop in smoking intensity among middle-income Hispanic smokers (Coeff.: -1.05; 95% CI: -1.78, -0.31) and high-income White smokers (Coeff.: -0.52; 95% CI: -0.95, -0.10); but, surprisingly, it was associated with a significant increase in smoking intensity among high-income African American smokers (Coeff.: 1.54; 95% CI: 0.63, 2.46). Results were not significant for other groups.

According to the secondary analyses for each major racial/ethnic group, the interaction terms between the Prop 56 indicator and the income-level indicator revealed that the differences in

the association of Prop 56 with smoking prevalence and smoking intensity across the known income groups were largely not significant (Supplemental Tables 3 and 4) with two exceptions. First, compared to high-income Whites, low-income Whites experienced a significantly greater reduction in smoking prevalence after the implementation of Prop (AOR:1.80;95% CI:1.14,2.85). Second, middle-income Whites experienced a greater reduction in smoking prevalence after the implementation of Prop 56 than high-income Whites (p-value=0.001) (data not shown).

DISCUSSION

This study provides evidence that Prop 56 was associated with reductions in smoking behavior across multiple racial/ethnic groups. We found no evidence of significantly differential responses in smoking behavior across racial/ethnic groups, suggesting that Prop 56 has not worsened observed racial/ethnic disparities in smoking. Nonetheless, this study highlights differential responses in smoking behavior across income groups. Within the White population, we found that low- and middle-income groups were significantly more likely to reduce smoking prevalence compared to the high-income group following the implementation of Prop 56. Changes in smoking intensity after Prop 56 were not significantly different across low-, middle-, and high-income groups. Within the racial/ethnic minority populations, there was no significant difference in the associations of Prop 56 with smoking prevalence and smoking intensity across income groups. These findings suggest that income-specific differential responses in smoking behavior are complex and depend not only on the form of smoking behavior investigated but within which racial/ethnic population that smoking behavior is explored.

A study by Keeler and colleagues indicated that the observed drop in smoking prevalence following the implementation of Prop 56 was driven by low-income Californians [9]. The current study offered additional insights, signaling a negative association between Prop 56 and smoking prevalence among Hispanics, Whites, and African Americans. We found that among the Hispanic and

African American populations, this negative association existed only in the middle-income group but not in other income groups. Within the White population, this negative association was observed in both low- and middle-income groups. Although the association between Prop 56 and smoking prevalence was not significant among Asians (p -value=0.058), the stratified analyses by income level indicated that Prop 56 was associated with a reduction in smoking prevalence among middle-income Asians. Furthermore, Keeler and colleagues study found no evidence of any significant association between Prop 56 and smoking intensity in either the low- (household incomes <\$25,000/year) or high-income (>\$75 000/year) group regardless of race/ethnicity [9]. In contrast, the current study found a negative association between Prop 56 and smoking intensity among middle-income Hispanic smokers and high-income White smokers. Surprisingly, we observed a positive association between Prop 56 and smoking intensity among high-income African American smokers; additional research is needed to investigate the underpinnings of this result.

The California Tobacco Control Program continues to make great strides in reducing smoking, but challenges persist. The economic burden of smoking in California was \$18.1 billion in 2009 [22]. Of particular concern, racial/ethnic disparities in the burden of smoking remain problematic in the state. For example, although Hispanics have the second lowest smoking prevalence among all racial/ethnic groups in California [1], a study found that the annual healthcare cost of smoking among Hispanics is huge, amounting to \$1.0 billion in 2010 dollars, largely because so many Californians identify as Hispanic [23]. Similarly, while accounting for only 6% of adult population, African Americans experience a disproportionately large tobacco-related disease burden, accounting for 8% of smoking-attributable healthcare cost and 13% of smoking-attributable mortality cost in California [24]. Researchers have found that racial/ethnic minorities as well as lower-income individuals also experience unique social and environmental contextual challenges such as greater environmental cues to smoking and greater level of stress and social discrimination [25].

The \$2/pack increase in cigarette taxes due to Prop 56 marked the first cigarette excise tax increase in California since 1999 [26]. As of 2020, California was ranked as having the twelfth highest state tax rate for cigarettes in the country [27]. Taxation represents an important feature of any comprehensive tobacco control program [3,28-29], and studies have shown that state-level tobacco control programs are highly successful in curbing cigarette smoking [3,30].

As with any tobacco tax policy analysis, one must consider the potential for regressivity. While the California Tobacco Control Program has saved \$134 billion in healthcare cost between 1989-2008 [31], lower-income groups continue to smoke at higher rates [1] and are thus likely to reap a smaller share of these savings. Nonetheless, a recent study found a larger life-expectancy benefit accrued from cigarette tax increases in lower-income counties relative to higher-income counties, which is evidence against the argument that cigarette taxes are regressive [32]. Literature examining price-responsiveness of smoking behavior across income groups shows mixed results. Some studies found that lower-income individuals were more price responsive [7-8]; other studies showed no difference in price-responsiveness between lower- and higher-income groups [10-11]. We found that among the White population, the reduction in smoking prevalence following Prop 56 tobacco tax increase was statistically greater in the low- and middle-income groups than the high-income group. This finding provides evidence that Prop 56 might have helped alleviate the regressivity of tobacco taxes and ease some of the observed disparity in the health burden caused by cigarette smoking among Whites in California.

Limitations

This study has several limitations. First, our analyses were based on cross-sectional data from the California BRFSS, making causality impossible to establish. While a difference-in-difference approach comparing pre-post changes between California and other states would be informative, we were unable to employ this approach because the BRFSS of other states does not collect smoking intensity data. Second, this study assessed the changes in smoking prevalence and intensity immediately following the implementation of Prop 56. We cannot comment on the longer-term effects of Prop 56. Third, this study examined differential associations of Prop 56 with smoking behavior for subgroups stratified by race/ethnicity and income. Subgroup analyses that cover other sociodemographic dimensions of public health importance, notably by age and gender, are worthy of exploration. Fourth, the post-implementation sample only accounted for approximately one-fourth of the study sample. The unbalanced sample sizes between the pre- and post-implementation samples might limit our ability to detect an effect. Notwithstanding this unbalance, we found a statistically significant reduction in smoking prevalence following Prop 56 across multiple racial/ethnic groups.

Fifth, this study did not quantify price elasticity of cigarette smoking, namely the percentage changes in smoking prevalence and smoking intensity in response to a 1% increase in cigarette price due to Prop 56 [6]. Future work in this area would be informative.

Sixth, Prop 56 not only increased the excise taxes on cigarettes by \$2/pack but also increased an equivalent tax on all other tobacco products including electronic cigarettes [26]. Previous studies showed that price elasticities of tobacco use vary across tobacco products [33-34]. Future research investigating the association of Prop 56 with the use of other tobacco products such as electronic cigarettes is warranted.

Seventh, this study did not address potential tax avoidance behaviors — for example, purchasing cigarettes from neighboring states with lower cigarette prices, from other countries, or over the internet — in response to the \$2/pack tax increase from Prop 56. Between April 1, 2017 and December 31, 2018, the state cigarette tax per pack in Arizona (\$2.00), Nevada (\$1.80), and Oregon (\$1.32 - \$1.33) were lower than in California (\$2.87) [27]. Previous studies which assessed the potential bootlegging due to differential cigarette taxes across states focused on population living within 20 miles of neighboring states [35-36]; however, the BRFSS geographic identifiers cannot resolve such small distances. Without considering the potential bootlegging, our estimated associations of California Prop 56 tobacco tax increase with smoking behavior are likely underestimated.

Lastly, Prop 56 was not the only tobacco control policy implemented during the study period. For example, in 2016, California enacted multiple new laws — closing loopholes in the state’s smoke-free law, defining e-cigarettes as a tobacco product, prohibited vaping wherever smoking is also not allowed, and increasing the legal age of sale of tobacco (18 to 21) [37]. To address the impact of Tobacco 21 law, we limited our study sample to those aged 21+ [10] but were not able to tease out the effects from other policies.

CONCLUSIONS

Prop 56 was associated with a reduction in smoking prevalence across multiple groups, particularly within the low- and middle-income subgroups. Our finding that there was no differential association of Prop 56 with smoking prevalence and smoking intensity across racial/ethnic groups suggests that Prop 56 has not worsened observed racial/ethnic disparities in smoking. Our findings also hint at the potential effectiveness of Prop 56 in curbing the income disparities in smoking among Whites but not among racial/ethnic minorities. However, our results also suggest that the

proposition's influence may be limited in terms of reducing smoking intensity among minorities and economically vulnerable populations, the exception being middle-income Hispanics. The result that Prop 56 was positively associated with smoking intensity among high-income African Americans alludes to broader considerations beyond purely economic factors. Researchers, policymakers, and advocates might consider the additional merits of targeted, community-based, non-economic tobacco control interventions to reach low- and middle-income groups within racial/ethnic minorities to reduce their disproportionate burden of smoking.

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Declaration of Interests

The authors have no conflicts of interest to disclose.

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Table 1. Sample size, smoking prevalence, and smoking intensity (CPD) among the final study sample of 60,857 adults aged 21+ for the full sample and each of the four major racial/ethnic groups by explanatory variables: California Behavioral Risk Factor Surveillance System, 2012-2018

	Smoking Prevalence										Average CPD									
	Full sample		Hispanics		NH White		NH African American		NH Asian		Full Sample		Hispanic		NH White		NH African American		NH Asian	
	N	W%	N	W%	N	W%	N	W%	N	W%	N	W%	N	W%	N	W%	N	W%	N	W%
<i>Total</i>	60,857	9.5	17,391	8.6	34,260	10.1	3,033	12.3	4,295	5.6	6,057	8.6	1,591	5.4	3,452	11.0	413	6.8	286	6.1
<i>Prop 56 indicator</i>																				
Pre-period	46,132	10.2	12,584	9.0	26,885	10.9	2,279	13.8	3,133	6.2	4,734	9.0	1,167	5.7	2,798	11.5	332	6.8	212	6.3
Post-period	14,725	7.5	4,807	7.3	7,375	8.1	754	8.3	1,162	3.9	1,323	7.3	424	4.1	654	9.2	81	6.8	74	5.0
<i>Race/ethnicity</i>																				
Hispanic	17,391	8.6	17,391	8.6	N/A	N/A	N/A	N/A	N/A	N/A	1,591	5.4	1,591	5.4	N/A	N/A	N/A	N/A	N/A	N/A
NH White	34,260	10.1	N/A	N/A	34,260	10.1	N/A	N/A	N/A	N/A	3,452	11.0	N/A	N/A	3,452	11.0	N/A	N/A	N/A	N/A
NH African American	3,033	12.3	N/A	N/A	N/A	N/A	3,033	12.3	N/A	N/A	413	6.8	N/A	N/A	N/A	N/A	413	6.8	N/A	N/A
NH Asian	4,295	5.6	N/A	N/A	N/A	N/A	N/A	N/A	4,295	5.6	286	6.1	N/A	N/A	N/A	N/A	N/A	N/A	286	6.1
NH Other	1,878	14.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	315	8.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<i>Income level</i>																				
Low-income	13,446	14.0	7,461	9.6	3,993	23.3	853	18.8	694	8.4	2,073	8.2	742	4.7	949	12.3	188	6.7	65	6.4
Middle-income	9,444	11.5	3,569	9.0	4,606	13.5	489	13.0	477	10.7	1,186	8.2	353	5.5	652	10.5	74	6.1	51	7.3
High-income	29,395	7.1	4,291	7.4	20,632	7.4	1,295	8.5	2,353	4.4	2,124	9.1	328	6.1	1,469	10.5	108	6.7	127	5.7
Unknown	8,572	7.3	2,070	7.1	5,029	7.6	396	9.5	771	3.9	674	8.8	168	6.9	382	10.6	43	8.5	43	4.9
<i>Gender</i>																				
Female	32,421	7.2	9,273	4.6	18,564	8.8	1,702	10.9	1,987	2.4	2,621	8.4	525	5.0	1,691	10.1	193	7.0	63	4.3
Male	28,436	11.8	8,118	13.1	15,696	115.0	1,331	13.8	2,308	8.4	3,436	8.7	1,066	5.5	1,761	11.8	220	6.6	223	6.5
<i>Age</i>																				
21-34	11,164	11.9	4,888	9.6	3,910	16.5	545	13.8	1,425	7.4	1,378	6.1	476	4.1	625	8.2	76	5.2	124	5.1

Table 1. Sample size, smoking prevalence, and smoking intensity (CPD) among the final study sample of 60,857 adults aged 21+ for the full sample and each of the four major racial/ethnic groups by explanatory variables: California Behavioral Risk Factor Surveillance System, 2012-2018

	Smoking Prevalence										Average CPD									
	Full sample		Hispanics		NH White		NH African American		NH Asian		Full Sample		Hispanic		NH White		NH African American		NH Asian	
	N	W%	N	W%	N	W%	N	W%	N	W%	N	W%	N	W%	N	W%	N	W%	N	W%
35-49	14,162	10.0	5,828	8.9	5,883	12.5	716	12.4	1,327	4.6	1,542	8.2	518	5.1	781	11.2	102	6.5	74	5.9
50-64	18,148	10.7	4,461	9.0	11,141	11.1	989	16.1	934	5.6	2,152	10.6	480	7.7	1,300	12.5	174	8.1	71	7.5
65+	17,383	5.0	2,214	3.6	13,326	5.1	783	6.6	609	3.3	985	11.3	117	6.6	746	12.2	61	7.4	17	10.3
<i>Education</i>																				
<High school degree	7,629	12.6	6,328	9.3	950	35.6	169	22.8	83	13.6	1,008	7.7	619	5.2	301	13.2	47	7.6	15	8.2
High school degree	10,953	14.2	4,119	10.7	5,417	17.1	653	16.8	383	10.9	1,678	9.0	458	5.2	954	12.1	129	7.2	43	8.9
Some college	15,700	12.0	3,649	8.4	9,665	1.7	1,092	10.3	669	11.2	1,946	9.3	351	5.4	1,259	11.2	149	6.2	75	5.7
College degree and above	26,575	5.2	3,295	5.1	18,228	5.0	1,119	10.1	3,160	3.8	1,425	7.8	163	6.4	938	8.8	88	6.9	153	5.3
<i>Employment status</i>																				
Employed	32,185	9.3	10,106	9.4	16,770	10.2	1,464	10.7	2,880	5.8	3,188	7.6	1,000	5.0	1,674	10.0	175	6.6	208	5.5
Unemployed	3,889	17.6	1,513	12.4	1,710	23.0	276	20.5	270	8.4	673	9.0	189	5.7	358	11.9	61	5.9	25	10.4
Not in labor force	24,783	8.2	5,772	6.2	15,780	8.5	1,293	12.4	1,145	4.6	2,196	10.1	402	6.1	1,420	12.1	177	7.4	53	6.0
<i>Marital status</i>																				
Married	30,478	6.5	8,583	6.9	17,661	6.5	923	9.2	2,452	4	2,032	8.4	606	5.4	1,122	10.6	89	7.8	120	6.0
Unmarried couple	3,015	14.8	1,504	12.6	1,224	17.9	100	19.2	109	10.9	417	7.6	164	5.3	204	10.6	21	3.8	13	4.8
Divorced/widowed/separated	16,363	12.2	3,666	9.2	10,546	13.6	1,089	11.2	500	7.5	2,089	10.4	398	5.9	1,393	12.4	144	7.6	34	10.3
Never married	11,001	13.4	3,638	10.7	4,829	16.8	921	15.8	1,234	8.2	1,519	7.6	423	5.0	733	10.0	159	6.1	119	5.2
<i>Health insurance status</i>																				
Private	27,500	7.3	6,461	7.4	16,174	7.9	1,233	8.6	2,777	4.4	2,119	8.4	509	5.6	1,259	10.3	111	8.1	152	5.2

Table 1. Sample size, smoking prevalence, and smoking intensity (CPD) among the final study sample of 60,857 adults aged 21+ for the full sample and each of the four major racial/ethnic groups by explanatory variables: California Behavioral Risk Factor Surveillance System, 2012-2018

	<u>Smoking Prevalence</u>										<u>Average CPD</u>										
	<u>Full sample</u>		<u>Hispanics</u>		<u>NH White</u>		<u>NH African American</u>		<u>NH Asian</u>		<u>Full Sample</u>		<u>Hispanic</u>		<u>NH White</u>		<u>NH African American</u>		<u>NH Asian</u>		
	<i>N</i>	<i>W%</i>	<i>N</i>	<i>W%</i>	<i>N</i>	<i>W%</i>	<i>N</i>	<i>W%</i>	<i>N</i>	<i>W%</i>	<i>N</i>	<i>W%</i>	<i>N</i>	<i>W%</i>	<i>N</i>	<i>W%</i>	<i>N</i>	<i>W%</i>	<i>N</i>	<i>W%</i>	
Medicare	13,400	8.1	1,941	8.9	9,870	7.3	634	12.8	567	5.6	1,062	9.8	164	5.7	711	11.8	85	6.1	36	7.2	
MediCal	7,688	13.4	4,066	8.1	2,476	23.0	538	16.7	334	7.5	1,219	8.5	371	5.2	629	11.1	110	7.6	32	7.0	
Other	6,290	11.7	1,144	11.4	4,144	10.8	411	13.4	349	7.2	691	9.2	129	5.7	428	11.7	59	5.9	25	5.9	
Uninsured	5,979	15.3	3,779	10.7	1,596	27.4	217	21.7	268	14	966	7.7	418	4.9	425	11.4	48	4.4	41	7.5	
<i>Obesity status</i>																					
Normal weight	22,534	9.6	4,632	8.9	13,953	10.4	795	15.9	2,510	5.4	2,325	8.9	444	5.8	1,473	10.9	140	5.9	152	5.9	
Overweight	22,342	9.1	6,849	8.7	12,370	9.3	1,110	12.1	1,321	5.9	2,173	8.2	620	5.1	1,191	11.0	148	6.4	99	5.6	
Obesity	15,981	9.8	5,910	8.4	7,937	10.8	1,128	9.8	464	6	1,559	8.6	527	5.2	788	11.2	125	8.4	35	7.9	

Note: CPD = cigarettes pre day; N=unweighted sample size; and NH=non-Hispanic.

Table 2. Estimated AORs from the multiple logistic regression analysis of smoking prevalence for the full sample and each of the four major racial/ethnic groups among adult respondents aged 21+: California Behavioral Risk Factor Surveillance System, 2012-2018

Covariates	Full Sample (N=60,857)		Hispanic (N=17,391)		NH White (N=34,260)		NH African American (N=3,033)		NH Asian (N=4,295)	
	AOR	95% CI	AOR	95% CI	AOR	95% CI	AOR	95% CI	AOR	95% CI
Prop 56 implemented (REF = No)	0.59	[0.49,0.72]***	0.66	[0.47,0.91]*	0.62	[0.47,0.81]***	0.47	[0.23,0.94]*	0.57	[0.32,1.02]
Middle income (REF = Low-income)	0.95	[0.83,1.09]	0.96	[0.75,1.22]	0.81	[0.66,1.00]	0.82	[0.50,1.35]	1.55	[0.87,2.77]
High-income (REF = Low-income)	0.74	[0.64,0.86]***	0.92	[0.71,1.20]	0.68	[0.56,0.84]***	0.57	[0.32,1.02]	0.80	[0.49,1.32]
Unknown income (REF = Low-income)	0.63	[0.53,0.74]***	0.81	[0.62,1.06]	0.56	[0.45,0.70]***	0.46	[0.25,0.87]*	0.64	[0.35,1.17]
Hispanic (REF = White)	0.84	[0.69,1.03]	N/A		N/A		N/A		N/A	
NH African American (REF = NH White)	0.51	[0.42,0.62]***	N/A		N/A		N/A		N/A	
NH Asian (REF = NH White)	0.39	[0.34,0.46]***	N/A		N/A		N/A		N/A	
NH Other (REF = NH White)	1.16	[0.92,1.46]	N/A		N/A		N/A		N/A	
Male (REF = Female)	1.80	[1.63,1.98]***	3.12	[2.57,3.80]***	1.35	[1.19,1.52]***	1.28	[0.86,1.90]	3.97	[2.57,6.13]***
Aged 35-49 (REF = 21-34)	1.03	[0.89,1.19]	1.09	[0.87,1.38]	0.95	[0.76,1.18]	1.32	[0.70,2.48]	0.92	[0.60,1.41]
Aged 50-64 (REF = 21-34)	0.96	[0.84,1.10]	1.13	[0.89,1.43]	0.79	[0.65,0.96]*	1.72	[0.96,3.10]	0.94	[0.58,1.52]
Aged 65+ (REF = 21-34)	0.31	[0.25,0.38]***	0.37	[0.25,0.55]***	0.26	[0.19,0.35]***	0.52	[0.25,1.09]	0.58	[0.24,1.38]
<High school education (REF = <High school degree)	1.13	[0.96,1.34]	0.92	[0.73,1.15]	2.26	[1.66,3.07]***	1.39	[0.79,2.44]	1.52	[0.57,4.05]
Some college (REF = <High school degree)	0.82	[0.73,0.93]**	0.81	[0.63,1.04]	0.84	[0.72,0.99]*	0.69	[0.47,0.99]*	1.15	[0.63,2.10]
College degree and above (REF = <High school degree)	0.38	[0.33,0.43]***	0.51	[0.36,0.72]***	0.33	[0.28,0.39]***	0.75	[0.45,1.24]	0.44	[0.25,0.78]**
Unemployed (REF = Employed)	1.38	[1.16,1.63]***	1.36	[1.03,1.80]*	1.28	[0.97,1.69]	1.26	[0.76,2.08]	0.95	[0.51,1.80]
Not in labor force (REF = Employed)	0.93	[0.83,1.05]	0.94	[0.73,1.21]	0.93	[0.79,1.09]	1.16	[0.75,1.81]	0.69	[0.42,1.12]
Member of an unmarried couple (REF = Married)	1.84	[1.51,2.24]***	1.66	[1.21,2.29]**	1.97	[1.50,2.58]***	2.05	[0.91,4.59]	2.96	[1.22,7.19]*
Divorced/widowed/separated (REF = Married)	1.93	[1.73,2.15]***	1.56	[1.27,1.93]***	2.03	[1.76,2.33]***	1.20	[0.77,1.88]	2.06	[1.07,3.96]*
Never married (REF = Married)	1.61	[1.41,1.84]***	1.42	[1.12,1.80]**	1.47	[1.21,1.80]***	1.60	[1.00,2.57]*	1.50	[1.01,2.24]*

Medicare (REF = Private insurance)	1.67 [1.35,2.08]***	1.60 [1.05,2.44]*	1.63 [1.18,2.25]**	1.58 [0.91,2.74]	1.38 [0.69,2.76]
MediCal (REF = Private insurance)	1.36 [1.15,1.60]***	1.14 [0.86,1.51]	1.50 [1.17,1.92]**	1.32 [0.78,2.24]	1.21 [0.66,2.24]
Other (REF = Private insurance)	1.47 [1.26,1.71]***	1.66 [1.22,2.25]**	1.33 [1.11,1.61]**	1.29 [0.78,2.13]	1.19 [0.69,2.03]
Uninsured (REF = Private insurance)	1.51 [1.30,1.75]***	1.19 [0.94,1.51]	2.05 [1.65,2.55]***	1.96 [1.11,3.45]*	1.82 [0.97,3.39]
Overweight (REF = Normal weight)	0.84 [0.75,0.93]**	0.84 [0.67,1.05]	0.81 [0.71,0.93]**	0.77 [0.47,1.25]	1.05 [0.73,1.49]
Obesity (REF = Normal weight)	0.80 [0.71,0.91]***	0.87 [0.69,1.09]	0.78 [0.65,0.93]**	0.53 [0.35,0.80]**	0.99 [0.55,1.79]
Survey year (Continuous)	1.05 [1.02,1.09]**	1.06 [1.00,1.13]	1.05 [1.01,1.10]*	1.06 [0.95,1.18]	1.02 [0.90,1.14]

Note: 95% confidence intervals in brackets. N=unweighted sample size; NH=non-Hispanic; and AOR = adjusted odds ratio. Full sample comprised individuals who identify as Hispanic, NH White, NH African American, NH Asian, and NH Other.

*Statistically significant at $p < .05$, **Statistically significant at $p < .01$, ***Statistically significant at $p < .001$.

Table 3. Estimated coefficients from the multiple linear regression analysis of smoking intensity (ie, log-transformed CPD) for the full sample and each of the four major racial/ethnic groups among adult respondents aged 21+: California Behavioral Risk Factor Surveillance System, 2012-2018

Covariates	Full Sample (N=6,057)		Hispanic (N=1,519)		NH White (N=3,452)		NH African American (N=413)		NH Asian (N=286)	
	Coeff.	95% CI	Coeff.	95% CI	Coeff.	95% CI	Coeff.	95% CI	Coeff.	95% CI
Prop 56 implemented (REF = No)	-0.28	[-0.51,-0.06]	-0.25	[-0.73,0.23]	-0.34	[-0.59,-0.08]**	0.13	[-0.43,0.69]	-0.35	[-1.07,0.37]
Middle income (REF = Low-income)	0.10	[-0.07,0.26]	0.31	[0.00,0.62]*	-0.09	[-0.27,0.10]	0.11	[-0.31,0.53]	0.58	[-0.09,1.26]
High-income-(REF = Low-income)	0.16	[-0.01,0.32]	0.45	[0.07,0.82]*	-0.01	[-0.19,0.17]	-0.19	[-0.74,0.36]	0.48	[-0.19,1.16]
Unknown income (REF = Low-income)	0.10	[-0.07,0.28]	0.32	[-0.03,0.67]	-0.08	[-0.29,0.13]	0.18	[-0.35,0.71]	0.06	[-0.61,0.74]
Hispanic (REF = White)	-1.01	[-1.16,-0.86]***	N/A		N/A		N/A		N/A	
NH African American (REF = NH White)	-0.44	[-0.68,-0.20]***	N/A		N/A		N/A		N/A	
NH Asian (REF = NH White)	-0.51	[-0.76,-0.25]***	N/A		N/A		N/A		N/A	
NH Other (REF = NH White)	-0.19	[-0.41,0.03]	N/A		N/A		N/A		N/A	
Male (REF = Female)	0.25	[0.14,0.36]***	0.24	[0.02,0.47]*	0.34	[0.21,0.46]***	-0.02	[-0.35,0.30]	0.76	[0.26,1.27]**
Aged 35-49 (REF = 21-34)	0.40	[0.23,0.57]***	0.35	[0.06,0.65]*	0.52	[0.32,0.73]***	-0.31	[-0.85,0.23]	0.11	[-0.37,0.58]
Aged 50-64 (REF = 21-34)	0.71	[0.56,0.86]***	0.92	[0.63,1.21]***	0.71	[0.52,0.91]***	0.18	[-0.27,0.64]	0.28	[-0.24,0.79]
Aged 65+ (REF = 21-34)	0.66	[0.45,0.87]***	0.49	[-0.02,1.00]	0.76	[0.50,1.02]***	0.14	[-0.51,0.79]	1.01	[0.18,1.84]*
<High school education (REF = <High school degree)	0.01	[-0.17,0.18]	0.08	[-0.21,0.38]	0.10	[-0.12,0.32]	0.01	[-0.52,0.54]	0.09	[-0.58,0.77]
Some college (REF = <High school degree)	-0.03	[-0.16,0.11]	0.21	[-0.09,0.51]	-0.10	[-0.26,0.06]	-0.25	[-0.58,0.08]	-0.48	[-1.11,0.15]
College degree and above (REF = <High school degree)	-0.30	[-0.47,-0.14]***	-0.08	[-0.60,0.43]	-0.50	[-0.67,-0.33]***	-0.21	[-0.64,0.23]	-0.36	[-0.87,0.15]
Unemployed (REF = Employed)	0.24	[0.07,0.42]**	0.23	[-0.11,0.57]	0.20	[-0.03,0.43]	0.14	[-0.32,0.60]	0.83	[0.19,1.46]*
Not in labor force (REF = Employed)	0.14	[0.00,0.27]*	0.27	[0.01,0.53]*	0.01	[-0.16,0.18]	0.14	[-0.24,0.52]	-0.18	[-0.73,0.37]
Member of an unmarried couple (REF = Married)	0.08	[-0.17,0.32]	0.15	[-0.27,0.56]	0.11	[-0.14,0.37]	-0.86	[-2.15,0.43]	1.09	[0.41,1.76]**
Divorced/widowed/separated (REF = Married)	0.15	[0.02,0.27]*	0.09	[-0.17,0.36]	0.10	[-0.05,0.24]	0.05	[-0.36,0.46]	0.78	[0.20,1.35]**
Never married (REF = Married)	0.11	[-0.05,0.27]	0.14	[-0.18,0.47]	-0.03	[-0.22,0.17]	-0.09	[-0.56,0.38]	0.05	[-0.42,0.52]
Medicare (REF = Private insurance)	0.13	[-0.07,0.33]	0.16	[-0.36,0.68]	0.16	[-0.05,0.37]	-0.47	[-0.95,0.01]	0.49	[-0.06,1.04]

MediCal (REF = Private insurance)	0.28 [0.10,0.45]**	0.38 [0.02,0.75]*	0.26 [0.04,0.48]*	-0.26 [-0.72,0.20]	0.61 [-0.05,1.27]
Other (REF = Private insurance)	0.07 [-0.13,0.26]	0.08 [-0.36,0.53]	0.14 [-0.07,0.36]	-0.54 [-1.11,0.03]	0.01 [-0.93,0.95]
Uninsured (REF = Private insurance)	0.11 [-0.06,0.28]	-0.09 [-0.43,0.26]	0.32 [0.12,0.53]**	-0.66 [-1.30,-0.01]*	0.74 [0.21,1.27]**
Overweight-(REF = Normal weight)	-0.11 [-0.24,0.02]	-0.28 [-0.58,0.01]	-0.11 [-0.25,0.03]	0.30 [-0.14,0.75]	-0.31 [-0.72,0.10]
Obesity (REF = Normal weight)	-0.02 [-0.16,0.12]	-0.25 [-0.54,0.03]	0.02 [-0.14,0.18]	0.50 [0.08,0.91]*	-0.21 [-0.84,0.42]
Survey year (Continuous)	0.00 [-0.04,0.04]	-0.08 [-0.17,0.01]	0.03 [-0.02,0.08]	-0.01 [-0.14,0.11]	0.03 [-0.12,0.18]

Note: 95% confidence intervals in brackets. CPD = cigarettes pre day; N=unweighted sample size; and NH=non-Hispanic. Full sample comprised individuals who identify as Hispanic, NH White, NH African American, NH Asian, and NH Other. *Statistically significant at $p < .05$, **Statistically significant at $p < .01$, ***Statistically significant at $p < .001$.

Table 4. Summary of the estimated AORs from the multiple logistic regression model of smoking prevalence, and estimated coefficients from the multiple linear regression model of smoking intensity for the low-, middle-, and high-income groups within the full sample and each of the four major racial/ethnic groups among adult respondents aged 21+: California Behavioral Risk Factor Surveillance System, 2012-2018

Select covariates	Smoking prevalence						Smoking intensity					
	Low-income (N=13,446)		Middle-income (N=9,444)		High-income (N=29,395)		Low-income (N=2,073)		Middle-income (N=1,186)		High-income (N=2,124)	
	AOR	[95% CI]	AOR	[95% CI]	AOR	[95% CI]	Coeff.	[95% CI]	Coeff.	[95% CI]	Coeff.	[95% CI]
a. Full Sample												
Prop 56 implemented (REF = No)	0.47	[0.34, 0.65]***	0.42	[0.28, 0.63]***	0.80	[0.59, 1.10]	-0.19	[-0.55, 0.16]	-0.41	[-0.87, 0.05]	-0.36	[-0.73, 0.02]
b. Hispanic												
Prop 56 implemented (REF = No)	0.63	[0.39, 1.01]	0.56	[0.31, 1.00] [†]	1.00	[0.47, 2.13]	0.06	[-0.60, 0.71]	-1.05	[-1.78, -0.31]**	-0.34	[-1.29, 0.62]
c. NH White												
Prop 56 implemented (REF = No)	0.40	[0.24, 0.65]***	0.39	[0.22, 0.71]**	0.96	[0.66, 1.42]	-0.25	[-0.59, 0.09]	-0.22	[-0.80, 0.37]	-0.52	[-0.95, -0.10] [†]
d. NH African American												
Prop 56 implemented (REF = No)	0.53	[0.23, 1.21]	0.21	[0.05, 0.90] [†]	0.43	[0.16, 1.17]	-0.34	[-1.31, 0.62]	-0.21	[-1.12, 0.70]	1.54	[0.63, 2.46]**
e. NH Asian												
Prop 56 implemented (REF = No)	0.47	[0.15, 1.47]	0.26	[0.07, 0.97] [†]	0.52	[0.23, 1.16]	-0.60	[-3.20, 2.00]	0.40	[-0.93, 1.73]	-0.43	[-1.58, 0.72]

Note: CI = 95% confidence interval; N=unweighted sample size; NH=non-Hispanic; and AOR = adjusted odds ratio. Respondents with missing income information excluded. Additional covariates in all models included: gender (reference = female), age (reference = 21-34), education (reference = < high school degree), employment status (reference = employed), marital status (reference = married), health insurance status (reference = private insurance), obesity status (reference = normal weight), and survey year (continuous). In the middle-income Hispanic smoking prevalence analysis, p-value = 0.499 and the 95th percentile value rounded to 1. *Statistically significant at p <.05, **Statistically significant at p <.01, ***Statistically significant at p <.001.