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Did Slowdown on Taxes and Program Impact California's Smoking Decline?

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Did Slowdown on Taxes and Program Impact California's Smoking Decline?

ABSTRACT

Objective: To assess whether a slow-down in implementing tobacco control policies in California after 2000 influenced trends in smoking behavior.

Methods: We assessed the strength of state tobacco control policies using excise tax data (1990-2014), tobacco control expenditures per capita, and workplace and home smoking restrictions (from the Tobacco Use Supplement of the Current Population Survey, 1992-2015). Smoking prevalence was assessed with the National Health Interview Survey, 1985-2015. We compared trends between California and rest of the United States (US) using split regression models with a knot at 2000.

Results: Throughout the 1990s, compared to the rest of the US, California had higher cigarette excise taxes, higher expenditures on tobacco control, more smoke-free workplaces, and more smokers with smoke-free homes. Except for smoke-free homes, these differences disappeared after 2000. During the 1990s, smoking prevalence declined much faster in California than in the rest of the US, but the decline slowed significantly after 2000.

Conclusions: Smoking prevalence is sensitive to continued implementation of tobacco control policies.

Key Words: Tobacco Control, Cigarette Tax, Social Norms, Policy, Smoking Prevalence

INTRODUCTION

In 1988, California pioneered a comprehensive statewide tobacco control program (TCP) to reduce the health consequences of cigarette smoking.[1] The program included many elements now designated as Best Practices for Tobacco Control,[2] and was funded through a voter tax initiative that locked in a portion of added cigarette tax monies to fund a tobacco control program. The program focused on social and environmental strategies aimed at de-normalizing tobacco use,[3] and included, 1) a successful mass media program;[4,5] 2) the world's first state-mandated legislation on smoke-free workplaces, restaurants and bars;[6,7] 3) the first statewide smokers helpline;[8] 4) implementation of smoke-free campuses and funding for anti-tobacco programs in schools;[9] and 5) an aggressive enforcement program to limit minors' ability to purchase cigarettes.[10] Within the first decade, this program had successfully reduced smoking behavior in California.[11]

In the rest of the US, some smaller population states (e.g. Massachusetts, Arizona, Oregon) introduced statewide tobacco control programs in the mid-1990s, primed by initiatives such as the American Stop Smoking Intervention Study for Cancer Prevention (ASSIST).[12,13] Tobacco control programs began to disseminate widely following the 1998 Master Settlement Agreement,[14] when the Tobacco Industry started paying larger sums of money to the states. After 2000, while other states boosted tobacco control initiatives, political changes in California weakened tobacco control policies,[15] and this has been associated with changes in per capita cigarette consumption trends.[16]

Considerable evidence suggests that tobacco control strategies reduce smoking.[17] Meaningful increases in cigarette prices achieved through regular increases in tobacco taxation is one of the most effective strategies.[12,18-22] Higher cigarette prices can motivate

smokers to cut back on their smoking or make a quit attempt, and discourage non-smokers from starting. State level expenditures on anti-tobacco campaigns also influence both adult smoking prevalence[23] and adolescent smoking initiation.[24,25] Mass media interventions have led to an increase in cessation among some adult smokers[26-28], and workplace smoking bans[29,30] and voluntary smoking restrictions in the home (for both smokers and nonsmokers) have been associated with reductions in tobacco use.[31-33] The prevalence of smoke-free homes among smokers reflects the level of de-normalization of cigarette smoking in the community, as smoking restrictions are voluntarily imposed by the occupants. Smoke-free homes have been associated with both increased successful quitting[34,35] and reduced initiation.[36]

In this paper, we use publicly available state-level data to assess how the implementation of state taxes and state level tobacco control expenditures changed in California and the rest of the US over time. We compare trends in these data as well as smoking prevalence between California and the rest of the US for two periods, focusing on whether trends changed after the year 2000.

METHODS

Data Sources

State Tobacco Control Expenditure. To examine tobacco control expenditures, we used estimates from the State Tobacco Control Expenditure Database, compiled by the Health Policy Center at the University of Illinois at Chicago.[37] These estimated expenditures measure each state's investments in tobacco control, including spending on tobacco surveillance and evaluation efforts, anti-tobacco advertising campaigns, and tobacco control program administration and management costs.

Tobacco Use Supplement of the Current Population Survey (TUS-CPS). The CPS, a monthly survey of the US civilian household population, has provided state-level estimates since 1985. Since 1992, The National Cancer Institute has coordinated a series of Tobacco Use Supplements (TUS) initially aimed at monitoring tobacco control progress for states in the ASSIST program.[38] The TUS-CPS provides estimates of smoking behavior at the state-level, as well as prevalence of smoking policies in indoor workplaces, secondhand smoke exposure, and smoke-free homes. We use eight different TUS undertaken between 1992 and 2015.[39]

Typically, each survey wave ("year") includes data from three separate months chosen so that each is an independent sample of the CPS (thus the data are collected at 4-month intervals). The typical overall US sample size for a given TUS-CPS annual survey is ~240,000 adults, with reported response rates ~80%. Of these, ~75-80% are self-respondents, with the remainder being proxy respondents. In this paper, we use only self-reported data, resulting in response rates of ~60-65%. The annual self-respondent sample size for California is >13,000.

National Health Interview Survey (NHIS). The NHIS provides a representative estimate (for four US regions and a national estimate) of smoking behavior from 26 surveys between 1985 and 2015. We obtained a data use agreement and statistical assistance from the National Center for Health Statistics (NCHS). Data were collated over 3-year periods (e.g., 2013–2015) for both California and the rest of the US to ensure that all sub-cells in the table met the NCHS minimum sample size to protect confidentiality. The NHIS annual household sample sizes range from 35 000 to 45 000 and have reported individual

level response rates >60% for the period 1985 to early 1990s and comparable with the TUS-CPS thereafter.[40] The California population is ~10% of the national sample.

State Cigarette Tax Data. Annual state cigarette excise tax rates were obtained from "The Tax Burden on Tobacco" for each state and year from 1990-2014.[41]

Measures

Tobacco Control Expenditure per Capita. State total expenditure in a given year was divided by the state population size to compute expenditure per capita.

Smoke-free Workplace. Using the TUS-CPS, we estimated the percent of indoor workers (i.e. not self-employed or working in their or someone else's home) who reported having a smoke-free workplace using three questions: "Is smoking restricted in ANY WAY at your place of work?", "Which of these best describes the smoking policy at your place of work for indoor public or common areas, such as lobbies, rest rooms, and lunch rooms?" and "Which of these best describes your place of work's smoking policy for work areas?" Only workers who answered that smoking was not allowed in any public areas or work areas were classified as having a smoke-free workplace.

Exposure of Non-smoking Indoor Workers to Second-hand Smoke at Work. Using the above population of all indoor workers and further selecting non-smokers, we examined their responses to the question, "During the past two weeks, has anyone smoked in the area in which you work?"

Smoke-free Homes among Smokers. All TUS-CPS respondents were asked, "Which statement best describes the rules about smoking in your home?" Only respondents who

chose the response, “Smoking is not permitted anywhere” were classified as having a smoke-free home. We computed the rate of smoke-free homes among current smokers.

Smoking Prevalence. We used the NHIS for our measure of smoking prevalence as it has data from before the start of the California Tobacco Control program. Ever smoking is defined as lifetime smoking of at least 100 cigarettes. Current smokers are identified through a follow-up question: starting in 1992, this was: ‘Do you now smoke cigarettes every day, somedays or not at all?’, and pre-1992, the question was simply: ‘Do you smoke cigarettes now?’ By special arrangement, we obtained data for each of the survey years for California and the rest of the US.

Statistical Analyses

To calculate the state tax and expenditure estimates for the rest of the US, we weighted the state-specific values (except for California) by state population size in that year, summed the weighted values over the rest of the US, and divided this value by the population size in the rest of the US. All the monetary measures were inflation adjusted to 2014 constant dollars.

For smoke-free workplaces, secondhand smoke exposure, smoke-free homes (collected in the TUS-CPS) and smoking prevalence (from NHIS), we used sampling weights provided by the survey to combine the state estimates into one for the rest of the US. Using PROC REG in SAS 9.4, we used linear regressions to estimate trends for California and the rest of the US. Each time trend was specified as a linear spline with one knot in year 2000, thus producing an estimate of the slope for the years 1990-2000 and years 2001-2015, respectively. Provided that the model provided a good fit for the

data, we used an F-test to identify if there was a difference in slope within each jurisdiction between the two periods. If there was no significant change in slopes between the periods, we repeated the regression without a knot and plotted the same slope for each period, otherwise, we plotted the spine regression with a different slope for each period. Using an F-test, we also assessed whether the slope for the period was significantly different between California and the rest of the US in each period. When there was insufficient data for a linear fit, we present the data as a histogram.

RESULTS

Trends in Cigarette Tax

In 1990, the state tax rate per pack of cigarettes was 66% higher in California than in the rest of the US (in 2014 dollars: California=$0.63 vs. rest of the US=$0.38) (**Figure 1a**). Over the next 9 years, the difference between the two rates declined considerably. In 1999, cigarette tax rates increased substantially in California, and, in the year 2000, the tax rate in California was 83% higher than the rest of the US (in 2014 dollars: California=$1.19 vs. rest of the US=$0.65). After 1999, the cigarette tax rate in California declined consistently with inflation so that it was $0.87 in 2014 (2014 dollars). In contrast, in the rest of the US, cigarette tax rates kept increasing, and, in 2007, surpassed the rate in California. In 2011, cigarette tax rates jumped further to $1.70 (2014 dollars), which was 87% higher than the rate in California in that year. In 2014, cigarette taxes were 79% higher in rest of the US compared to California.

Trends in Tobacco Control Expenditure

In 1991, California spent $7.80/capita (2014 dollars) on tobacco control compared to the minimal spending in the rest of the US ($0.06/capita) (**Figure 1b**). Throughout the 1990s,

California's tobacco control expenditure varied considerably. It averaged over $4/capita/year (2014 dollars) from 1991-93, again in 1997-99, and yet again in 2001-2.

In the rest of the US, tobacco control expenditure was less than $1/capita/year (2014 dollars) prior to 1999, or ~12% of the level of expenditure in California during this period. It then rose to peak at $3.70/capita/year in 2002. In the decade following 2003, the average annual tobacco control expenditure was similar in California and the rest of the US ($2.70 vs. $2.60, respectively).

Trends in Smoke-Free Workplaces

The linear regression for the trends in smoke-free workplace was a good fit (R^2_{adj}=0.93). In 1992, 53% (95% CI: 52.3-54.7%) of indoor workers in California reported having a smoke-free workplace, which was significantly higher than the 43% (95% CI: 42.9-43.5%) reported in the rest of the US (**Figure 2a**). By 1995-96, this prevalence rate had increased by 10% in both jurisdictions and remained significantly higher in California until 2006. By 2010, however, the prevalence of smoke-free workplaces in California (78.5%; 95% CI: 77.2-79.7%) was significantly lower than that in the rest of the US (82.2%, 95% CI: 81.8-82.5%).

The linear model of non-smokers' exposure to secondhand smoke in indoor workplaces was not a good fit (R^2_{adj}=0.52) so we present these data as a histogram. In 1995, only 4.8% (95% CI: 4.2-5.3%) of California nonsmokers reported exposure to secondhand smoke in indoor workplaces, which was significantly lower ($p<0.0001$) than those in the rest of the US (7.8%; 95% CI: 7.6-8.1%) (**Figure 2b**). Reported exposure stayed significantly higher in the rest of the US through 2006. By 2010, however, exposure to

secondhand smoke in California (4.6%, 95% CI: 3.9-5.4) was significantly higher (p=0.0154) than in the rest of the US (3.8% 95% CI: 3.7-4.0).

Trends in Smoke-free Homes Among Smokers

In 1992, 19.7% (95% CI:16.1-23.4%) of California smokers reported having a smoke-free home, which was significantly higher than the 9.4% of smokers reporting a smoke-free home in the rest of the US (95% CI: 8.5-10.2%) (**Figure 3**). There was little evidence of a change in this trend across study periods in either California (p=0.54) or in the rest of the US (p=0.28), and a linear line fit the data well (R^2_{adj}=0.99). The rate of increase in California was 2.4%/year (p<0.0001) and in 2014-15, 71.7% (95% CI: 65.7-77.8%) of smokers had a smoke-free home. In the rest of the US, the proportion of smokers with smoke-free homes increased at a rate (1.8%/year) that was approximately 25% slower than in California, and, in 2014-15, a much lower percentage (49.5%; 95% CI: 48.1-51.0%) of smokers had a smoke-free home.

Trends in Smoking Prevalence

In 1985, smoking prevalence in California was 39.9% (95% CI, 37.1-42.8%) which was 7.5% lower than in the rest of the US (43.1%; 95% CI:42.0-44.2%) (**Figure 4**). With the start of the Tobacco Control Program, prevalence in California declined at a much faster rate than it did in the rest of the US (1.11%/yr vs 0.43%/yr, p<0.0001) so that in 2001, prevalence in California (23.0%;95% CI: 21.3%-24.7%) was 37% lower than in the rest of the US (36.2%; 95% CI: 35.4%-37.0%). However, after 2001, the decline in prevalence slowed considerably in California (from 1.11%yr to 0.31%/yr, p=0.001) while the decline in the rest of the US did not change significantly. Thus, by the end of the

period, California prevalence (19.3%; 95% CI: 17.1-21.5%) was 39% lower than that in the rest of the US (31.7%; 95% CI: 30.6%-32.7%).

DISCUSSION

Our examination of tobacco control expenditures, excise taxes, workplace and home smoking restrictions, and smoking prevalence over time in California compared to the rest of the US reveals trends that help understand the impact of tobacco control policies. The first US Tobacco Control Program in California was associated with a rapid decline in smoking prevalence compared to the rest of the US. By the year 2001, smoking prevalence in California was 37% lower than in the rest of the US. After 2001, the rest of the US strengthened their tobacco control policies, catching up with California on cigarette taxes, expenditure on tobacco control programs and protection of indoor workers from secondhand smoke. Indeed, the only advantage that California maintained appeared to be higher social norms against smoking, as evidenced by the high prevalence of smoke-free homes among smokers. The lack of further cigarette tax increases and the decline in expenditure on tobacco control activities was reflected in a significant slowing in California's decline in smoking prevalence and, between 2000-2015, the gap between California and the rest of the US stabilized at 39%.

Since the 1960s, California had raised cigarette taxes approximately every decade.[42] In 1988, California increased its cigarette tax by 25 cents, and in 1999 by an additional 50 cents. However, attempts to raise the tax in voter initiatives failed in both 2006 and 2012.[43] It wasn't until November 2016 that the voter initiative process succeeded and cigarette taxes were again increased, by $2/pack. While California failed to raise cigarette

taxes between 2000-2015, 28 other states increased their cigarette taxes by at least $1, resulting in California dropping in rank to 34th of the 50 states in cigarette taxes by 2015.

The 1988 voter proposition and accompanying legislation authorizing California's Tobacco Control Program suggested that state expenditures on tobacco control strategies would be consistent over time, dropping only in response to taxed sales.[1] However, political defunding of the program during the first half of the 1990s has been well documented and led to the voluntary health agencies successfully suing the administration. Recovered monies increased per capita expenditure significantly in the 1997-99 period.[44] After 2002, successive California administrations renewed the practice of diverting funding away from the Tobacco Control Program,[45] so that per capita levels were well below those for the key years in the 1990s, and were equivalent to the average expenditure in all other US states.

A measure of social norms against smoking can be captured by the number of smoke-free homes among smokers. Smokers implement a smoke-free home to protect nonsmokers in the family from secondhand smoke and to keep their home acceptable for non-smoking friends to visit.[34] The continued advantage that California experienced in social norms against smoking may be the result of the California Tobacco Control Program's media messages compared to those used in other programs across the nation. The Best Practices for Tobacco Control[2] recommends using advertisements that strongly portray the serious consequences of smoking, graphically or emotionally. These types of messages were first used in Australia,[46] but have since formed the basis for many US media campaigns, including those in Massachusetts,[47] New York[48] and the Federal TIPS campaign.[49] However, the California program focused on changing social norms around the use of

tobacco by creating a social environment and legal climate where tobacco use becomes less desirable, acceptable, and accessible.[50] Thus, although other programs caught up to California in expenditures on tobacco control, the different messaging approaches resulted in California maintaining a clear advantage on social norms through 2015.

A smaller proportion of indoor workers in California had a smoke-free workplace and a higher proportion of nonsmokers were exposed to secondhand smoke in those workplaces in 2014, suggesting that California workers had a higher level of exposure to secondhand smoke than workers in the rest of the US, which was unexpected. California's smoke-free workplace law passed eight years before a second state (Delaware) passed such a law in 2002.[51] However, the politics involved with the passage of the initial law in a particular domain can often mean that the law is much less protective than subsequent laws that use recommended model language. The Framework Convention for Tobacco Control adopted in 2003, laid such model language for smoke-free workplace laws.[52] Importantly, the rest of the US had fewer non-smokers exposed to secondhand smoke only when California's prevalence of secondhand smoke exposure was already minimal (below 4%). California's law was brought up to model standards in 2016.

This study has a number of strengths. It uses population estimates from the national TUS-CPS that were designed to monitor trends in the implementation of tobacco control interventions and policies at the state level. Thus, from 1992-2015, survey methods and questions were the same for all states. In using the rest of the US as the control for California (the most populous state in nation), we have followed previous research[11,42,53] that identified differential trends in smoking behaviors. A limitation is that these surveys did not measure all tobacco control strategies. We were unable to verify exposure to

secondhand smoke with biochemical measures. Finally, we do not include any estimates of whether tobacco marketing practices varied between the two jurisdictions, although it has been reported previously that this occurs.[54] Another strength is that we use a different national survey (NHIS) to estimate smoking prevalence, as the NHIS includes measures from before the start of the 1988 California Tobacco Control Program.

CONCLUSIONS

In summary, during the 1990s, California led the nation in implementing tobacco control strategies including increasing cigarette excise taxes and per capita expenditures on programs to reduce smoking. These measures were associated with higher rates of indoor workers with smoke-free workplaces and lower exposure of nonsmokers to secondhand smoke. The program influenced social norms regarding smoking, and California smokers were much more likely to report a smoke-free home than smokers in the rest of the US. Smoking prevalence in California declined substantially during 1988-2000, and much faster than the rate of decline in the rest of the US. Between 2000 and 2014, tobacco control in California weakened: voter initiatives failed to further increase cigarette excise taxes and per capita expenditures on tobacco control dropped below those of the rest of the US. Although California was able to maintain higher social norms against smoking (as assessed by smokers with smoke-free homes), California's decline in smoking prevalence slowed considerably. Our analysis shows that continued implementation of tobacco control policies is necessary to influence smoking prevalence and move towards a smoke-free society.

IMPLICATIONS FOR TOBACCO REGULATION

The California Tobacco Control Program was unable to increase tobacco taxes after 1999 for 17 years, and funding for its tobacco control programs dropped below $3 per capita. These changes were associated with a slowdown in the dramatic decline that the program had previously had on smoking prevalence, even though social norms against smoking appeared to remain higher in the state compared to the rest of the US. This emphasizes the importance of regular tobacco tax increases as well as continued funding of tobacco control programs at a level of at least $4 per capita per year.

Human Subject Approval Statement: The study was reviewed by an IRB Chair of the Human Research Protections Program at the University of California, San Diego and was certified as exempt from IRB under 45 CFR 46.101(b), category 4.

Conflict of Interest Disclosure Statement: All authors of this article declare that they have no conflicts of interest.

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REFERENCES

1. Bal DG, Kizer KW, Felten PG, Mozar HN, Niemeyer D. Reducing tobacco consumption in California. Development of a statewide anti-tobacco use campaign. *JAMA.* 1990;264(12):1570-1574.
2. Centers for Disease Control and Prevention. Smoking and Tobacco Use: Best Practices for Comprehensive Tobacco Control Programs—2014. Atlanta, GA: US Department of Health and Human Services, CDC;2014.

3323. Bal DG. Designing an effective statewide tobacco control program--California. 333 *Cancer.* 1998;83(12 Suppl Robert):2717-2721.
3344. Hu TW, Sung HY, Keeler TE. Reducing cigarette consumption in California: 335 tobacco taxes vs an anti-smoking media campaign. *Am J Public Health.* 336 1995;85(9):1218-1222.
3375. Pierce JP, Evans N, Farkas AJ, et al. Chapter 5: The Impact of the Antitobacco 338 Mass Media Campaign in California. In Tobacco Use in California: An Evaluation 339 of the Tobacco Control Program, 1989–1993. University of California, San Diego, 340 1994. UC San Diego Library Digital Collections 341 http://library.ucsd.edu/dc/object/bb2561275p/_3_1.pdf
3426. Gilpin EA, Farkas AJ, Emery SL, Ake CF, Pierce JP. Clean indoor air: advances in 343 California, 1990-1999. *Am J Public Health.* 2002;92(5):785-791.
3447. Magzamen S, Charlesworth A, Glantz SA. Print media coverage of California's 345 smokefree bar law. *Tob Control.* 2001;10(2):154-160.
3468. Zhu SH, Anderson CM, Johnson CE, et al. A centralised telephone service for 347 tobacco cessation: the California experience. *Tob Control.* 2000;9 Suppl 2:II48-348 55.
3499. Pierce J, Gilpin E, Emery S, et al. Chapter 10: School Smoking: Policies and 350 Compliance. In The California Tobacco Control Program: A Decade of Progress, 351 Results from the California Tobacco Survey, 1990-1999. University of California, 352 San Diego, 2001. UC San Diego Library Digital Collections 353 http://library.ucsd.edu/dc/object/bb6076666g/_5_1.pdf
35410. Gilpin E, Emery S, Farkas A, et al. Chapter 9: Access and Ease of Purchase of 355 Cigarettes. In The California Tobacco Control Program: A Decade of Progress, 356 Results from the California Tobacco Survey, 1990-1999. University of California, 357 San Diego, 2001. UC San Diego Library Digital Collections 358 http://library.ucsd.edu/dc/object/bb6076666g/_5_1.pdf
35911. Pierce JP, Gilpin EA, Emery SL, et al. Has the California Tobacco Control 360 Program Reduced Smoking? *JAMA.* 1998;280(10):893-899.
36112. National Cancer Institute. Evaluating ASSIST: A Blueprint for Understanding 362 State-level Tobacco Control. Tobacco Control Monograph No. 17. Bethesda, 363 MD: U.S. Department of Health and Human Services, National Institutes of 364 Health, National Cancer Institute. NIH Pub. No. 06-6058, October 2006.
36513. National Cancer Institute. ASSIST – Shaping the Future of Tobacco Prevention 366 and Control. Tobacco Control Monograph 16. Bethesda, MD: U.S. Department of 367 Health and Human Services, National Institutes of Health, National Cancer 368 Institute. NIH Pub. No. 05-5645, May 2005.
36914. Master Settlement Agreement. National Association of Attorneys General. Web: 370 http://www.naag.org/backpages/naag/tobacco/msa/msa-pdf (accessed 2-10-17). 371 1998.
37215. Ibrahim J, Glantz S. *Tobacco Policy Making in California 2001-2003: No Longer 373 Finishing First.* Center for Tobacco Control Research and Education.Tobacco 374 Control Policy Making: United States. University of California, San Francisco. 375 http://escholarship.org/uc/item/037948rj

16. Pierce JP, Shi Y, Hendrickson EM, et al. Tobacco control in California compared with the rest of the USA: trends in adult per capita cigarette consumption. *Tob Control.* 2017. doi: 10.1136/tobaccocontrol-2017-053895.
17. Gilpin EA, Stillman FA, Hartman AM, Gibson JT, Pierce JP. An index for US state tobacco control initial outcomes. *Am J of Epidemiol.* 2000;152(8):727-738.
18. International Agency for Research on Cancer Prevention. Effectiveness of Tax and Price Policies for Tobacco Control. Lyon, France. 2011. https://www.iarc.fr/en/publications/pdfs-online/prev/handbook14/handbook14-0.pdf
19. Chaloupka FJ, Yurekli A, Fong GT. Tobacco taxes as a tobacco control strategy. *Tob Control.* 2012;21(2):172-180.
20. Contreary KA, Chattopadhyay SK, Hopkins DP, et al. Economic Impact of Tobacco Price Increases Through Taxation: A Community Guide Systematic Review. *Am J Prev Med.* 2015;49(5):800-808.
21. U.S. National Cancer Institute and World Health Organization. *The Economics of Tobacco and Tobacco Control.* National Cancer Institute Tobacco Control Monograph 21. NIH Publication No. 16-CA-8029A. Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute; and Geneva, CH: World Health Organization; 2016.
22. Stillman FA, Hartman AM, Graubard BI, et al. Evaluation of the American Stop Smoking Intervention Study (ASSIST): a report of outcomes. *J Natl Cancer Inst.* 2003;95(22):1681-1691.
23. Dwyer T, Pierce JP, Hannam CD, et al. Evaluation of the Sydney "Quit. For Life" anti-smoking campaign. Part 2. Changes in smoking prevalence. *Med J Aust.* 1986;144:344-347.
24. Bauer UE, Johnson TM, Hopkins RS, Brooks RG. Changes in youth cigarette use and intentions following implementation of a tobacco control program: findings from the Florida Youth Tobacco Survey, 1998-2000. *Jama.* 2000;284(6):723-728.
25. Dietz NA, Westphal LL, Arheart KL, et al. Changes in youth cigarette use following the dismantling of an antitobacco media campaign in Florida. *Prev Chronic Dis.* 2010;7(3):A65.
26. Pierce JP, Macaskill P, Hill D. Long-term effectiveness of mass media led antismoking campaigns in Australia. *Am J Public Health.* 1990;80(5):565-569.
27. Bala M, Strzeszynski L, Cahill K. Mass media interventions for smoking cessation in adults. *Cochrane Database Syst Rev.* 2008(1):Cd004704.
28. U.S. National Cancer Institute. The Role of the Media in Promoting and Reducing Tobacco Use. Tobacco Control Monograph 19. Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute. NIH Pub. No. 07-6242, June 2008.
29. Becker CM, Lee JG, Hudson S, et al. A 14-year longitudinal study of the impact of clean indoor air legislation on state smoking prevalence, USA, 1997-2010. *Prev Med.* 2017;99:63-66.
30. Callinan JE, Clarke A, Doherty K, et al. Legislative smoking bans for reducing secondhand smoke exposure, smoking prevalence and tobacco consumption. *Cochrane Database Syst Rev.* 2010(4):Cd005992.

42131. Monson E, Arsenault N. Effects of enactment of legislative (public) smoking bans
422 on voluntary home smoking restrictions: A review. *Nicotine Tob Res.* 2016.
42332. Mons U, Nagelhout GE, Allwright S, et al. Impact of national smoke-free
424 legislation on home smoking bans: findings from the International Tobacco
425 Control Policy Evaluation Project Europe Surveys. *Tob Control.* 2012.
42633. Cheng KW, Glantz SA, Lightwood JM. Association between smokefree laws and
427 voluntary smokefree-home rules. *Am J Prev Med.* 2011;41(6):566-572.
42834. Gilpin EA, White MM, Farkas AJ, et al. Home smoking restrictions: which
429 smokers have them and how they are associated with smoking behavior. *Nicotine*
430 *Tob Res.* 1999;1(2):153-162.
43135. Messer K, Mills AL, White MM, Pierce JP. The effect of smoke-free homes on
432 smoking behavior in the U.S. *Am J Prev Med.* 2008;35(3):210-216.
43336. Farkas AJ, Gilpin EA, White MM, Pierce JP. Association between household and
434 workplace smoking restrictions and adolescent smoking. *JAMA.* 2000;284(6):717-
435 722.
43637. Huang J, Gwarnicki C, Binns S, Bachler M, Chaloupka F. State Tobacco Control
437 and Prevention Expenditures: FY 2008 – 2011. *Health Policy Center Institute for*
438 *Health Research and Policy University of Illinois at Chicago.* 2015.

43938. Ginexi EM, Vollinger RE. National Cancer Institute's leadership role in promoting
440 state and community tobacco control research. *Tob Control.* 2016;25(Suppl 1):i4-
441 i5.
44239. US Census Bureau Department of Commerce. *National Cancer Institute and*
443 *Food and Drug Administration co-sponsored Tobacco Use Supplement to the*
444 *Current Population Survey: 2005-16.* Bethesda, MD: National Cancer Institute.
445 2017. http://thedataweb.rm.census.gov/ftp/cps_ftp.html#cpssupps
44640. Centers for Disease Control and Prevention. *About the National Health Interview*
447 *Survey.* 2017; https://www.cdc.gov/nchs/nhis/about_nhis.htm#sample_design.
44841. Orzechowski W, Walker RC. The Tax Burden on Tobacco: Volume 51, 1970-
449 2016. Washington D.C.: Centers for Disease Control and Prevention, National
450 Center for Chronic Disease Prevention and Health Promotion, Office on Smoking
451 and Health. 2017. https://chronicdata.cdc.gov/Policy/The-Tax-Burden-on-
452 Tobacco-Volume-51-1970-2016/7nwe-3aj9.
45342. Pierce JP, Messer K, White MM, Kealey S, Cowling DW. Forty years of faster
454 decline in cigarette smoking in California explains current lower lung cancer
455 rates. *Cancer Epidemiol Biomarkers Prev.* 2010;19(11):2801-2810.
45643. Feng M, Pierce JP, Szczypka G, et al. Twitter analysis of California's failed
457 campaign to raise the state's tobacco tax by popular vote in 2012. *Tob Control.*
458 2017;26:434-439.
45944. Glantz SA, Balbach ED. *Tobacco War. Inside the California Battles.* Berkeley,
460 CA: University of California Press; 2000.
46145. Hong MPH, Barnes RL, Glantz SA. *Tobacco Control in California 2003-2007:*
462 *Missed Opportunities.* San Francisco, CA: University of California, San
463 Francisco, Center for Tobacco Control Research and Education. 2007.
464 https://escholarship.org/uc/item/7ck056qf
46546. Hill D, Chapman S, Donovan R. The return of scare tactics. *Tob Control.*
466 1998;7(1):5.

47. Hamilton WL, Norton GD, Weintraub J. *Independent Evaluation of the Massachusetts Tobacco Control Program: Seventh Annual Report January 1994 to June 2000* Massachusetts Tobacco Control Program, Abt Associates, Massachusetts Department of Public Health;2000.
48. Farrelly MC, Duke JC, Davis KC, et al. Promotion of smoking cessation with emotional and/or graphic antismoking advertising. *Am J Prev Med.* 2012;43(5):475-482.
49. McAfee T, Davis KC, Alexander RL, Jr., Pechacek TF, Bunnell R. Effect of the first federally funded US antismoking national media campaign. *The Lancet.* 2013;382(9909):2003-2011.
50. Roeseler A, Burns D. The quarter that changed the world. *Tob Control.* 2010;19 Suppl 1:i3-15.
51. International Agency for Research on Cancer. *Evaluating the Effectiveness of Smoke-free Policies.* Lyon, France: IARC Handbook of Cancer Prevention, Volume 13. 2009. http://www.iarc.fr/en/publications/pdfs-online/prev/handbook13/index.php
52. World Health Organization Framework Convention on Tobacco Control (FCTC) World Health Organization 2003; http://www.who.int/fctc/en/.
53. Pierce JP, Messer K, White MM, Cowling DW, Thomas DP. Prevalence of heavy smoking in California and the United States, 1965-2007. *JAMA.* 2011;305(11):1106-1112.
54. Wakefield M, Szczypka G, Terry-McElrath Y, et al. Mixed messages on tobacco: comparative exposure to public health, tobacco company- and pharmaceutical company-sponsored tobacco-related television campaigns in the United States, 1999-2003. *Addiction.* 2005;100(12):1875-1883.

Figure 1a. State Cigarette Tax Rates for California and the Rest of the US, 1990-2014 (adjusted to 2014 dollars)

Figure 1b. Per Capita Tobacco Control Expenditure for California and the Rest of the US, 1991-2012 (adjusted to 2014 dollars)

Figure 2a. Percent of Indoor Workers Who Reported a Smoke-Free Workplace in California and the Rest of the US, 1992-2011.

Figure 2b. Percent of Non-Smokers Exposed to Secondhand Smoke in Indoor Workplaces in California and the Rest of the US: 1995-2010

Figure 3. Percentage of Smokers Who Reported Having a Smoke-Free Home in California and the Rest of the US, 1992-2015.

Figure 4. Proportion of Smokers with a Quit Attempt Using Pharmaceutical and Other Assistance to Quit in California and the Rest of the US, 2003 & 2010