



Evidence of Effectiveness

A Summary of State Tobacco Control Program Evaluation Literature



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A Summary of State Tobacco Control Program Evaluation Literature

May 2005

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Abbreviations and Technical Terms □

95% Confidence Interval (CI)

A computed interval with a 95% probability that the true value is contained within the interval. In this document, the first occasion of a 95% CI is stated as (95% CI = X, X) within a summary; the comparison group's confidence interval thereafter is listed as (X, X).

Absolute Percentage Change

The difference in actual percentage at two points in time. For example, a decrease in prevalence from 20% to 15% is an absolute decrease of 5 percentage points.

ADC

Average daily consumption; the average number of cigarettes smoked per day by continuing smokers.

ANOVA

Acronym for “analysis of variance,” a statistical test of the difference between three or more independent samples.

AOR

Adjusted odds ratio (see OR); the association is adjusted for variables that have been indicated in the model.

ASSIST

American Stop Smoking Intervention Study.

Attributable Risk

The proportion of disease or other outcome in **exposed** individuals that can be attributed to the exposure of interest, calculated by subtracting the rate of the outcome (e.g., incidence, mortality) among the unexposed from the rate among the exposed individuals. Sometimes *attributable risk* is used to refer to the proportion of **all cases** that can be attributed to the exposure of interest; however, this is defined as the *attributable fraction*, and is calculated by dividing the *attributable risk* by the incidence rate in the group.

β

Beta coefficient; an indicator of the relative weight attached to the independent variable in contributing to the mean of the dependent variable in a standardized multivariate regression. The larger the absolute value of β, the greater the impact of the independent variable on changes in the dependent variable.

BRFSS

Behavioral Risk Factor Surveillance System; a population-based telephone survey of noninstitutionalized adults conducted at the state and large metropolitan area levels to assess health risks and protective behaviors. For more information, see <http://www.cdc.gov/brfss>.

CDC

Centers for Disease Control and Prevention.

IOI

Initial Outcomes Index; developed by Stillman et al. (2003) as a summary measure that assesses policy outcomes. The IOI includes (1) the percentage of workers covered by 100% smoke-free workplace laws, (2) the average cigarette price (including tax), and (3) a yearly rating of state and local smoke-free legislation.

OR

Odds ratio; the probability of a certain outcome or disease when a particular exposure is present. For example, the exposure-odds ratio is the odds of exposure among the cases compared with the odds of exposure among the controls.

OSH

Office on Smoking and Health; the division that leads CDC's tobacco use prevention and control efforts.

p

p value; the probability that the observed difference could have occurred by chance if the groups were actually similar. For example, a test statistic followed by “ $p < 0.05$ ” means that there is less than a 5% chance that the observed difference is due to chance and suggests that the null hypothesis should be rejected (i.e., that the difference is genuine).

PCC

Per capita consumption; the number of cigarette packs sold per adult in the population in a specified time frame. PCC can be measured as packs/person/month, packs/person/year, or packs/year/year, which averages the annual rate per adult within a specified span of years.

Price Elasticity

Price elasticity is the percentage change in demand resulting from a 1% change in consumer price. For example, a price elasticity of cigarette demand of -0.4 means that a 1% increase in price causes a 0.4% reduction in demand.

QIT

Question Inventory on Tobacco; an online searchable database that categorizes over 1,000 tobacco-related survey questions. This resource can be found at http://apps.nccd.cdc.gov/QIT/index_clt.asp

Quit Ratio

The proportion of ever smokers who have quit smoking, often expressed as a percentage. A quit ratio may be calculated by dividing the number of former smokers by the percentage of ever smokers (i.e., former plus current smokers).

Quit Success Rate

The proportion of previous-year smokers who have recently quit; “recent” may be defined by the author.

r

Represents the correlation coefficient, which is a measure of association indicating the degree to which two

variables have a statistically linear relationship; *r* can range from -1 (perfect negative linear association) to $+1$ (perfect positive linear association).

Relative Change

Measures the degree of change over time. For example, a decrease in prevalence from 20% to 15% is equal to a relative decline of 25% $[(0.20 - 0.15)/0.20]$.

SE

Standard Error; the standard deviation of an estimate, which is used to calculate the confidence interval.

SEER

Surveillance, Epidemiology, and End Result, a program of the National Cancer Institute. The SEER program currently collects and publishes cancer incidence and survival data from 14 population-based and 3 supplemental cancer registries covering approximately 26% of the U.S. population. For more information, see <http://seer.cancer.gov>

SOTC

Strength of Tobacco Control; an index developed by Stillman et al. (2003) to help determine the effectiveness of different components of ASSIST or ASSIST-like programs. The SOTC is a multielement measure that assesses the combined amount of three variables in each state: tobacco control resources (state budgetary expenditures and number of full-time tobacco personnel), capacity (health department infrastructure, staff experience, interagency relationships, and number and coverage of statewide coalitions), and program efforts focused on policy and environmental change.

TIPS

Tobacco Information and Prevention Source; the Web site of the Office on Smoking and Health, <http://www.cdc.gov/tobacco> This Web site contains links to fact sheets, publications, the Question Inventory on Tobacco (QIT), all of the Sustaining State Programs information and products, and much more.

Introduction □

How do we know that comprehensive state tobacco control programs are effective in reducing tobacco use? As state programs lose funding, there is an urgent need to collect and update the evidence of their effectiveness.

The purpose of this literature summary is to present findings on the effectiveness of comprehensive state tobacco control programs. Several recent reviews have been published, including those by Siegel (2002) and the Institute of Medicine (2000). However, several major evaluation studies have been published since 2002, and many states have presented evaluation results in state reports or with independent evaluators. This summary is not a listing of all available evidence on state programs; rather, it is a focused selection of the most relevant, recent evidence, and it attempts to include states other than those cited most often.

Methods and Organization

- **Section 1:** Recent *major review articles* are first summarized.
- **Section 2:** From the reference lists of the review articles, the *major evaluation studies* are summarized. A Medline search of additional state evaluation studies was conducted to identify studies published since the most recent review article in 2002. In addition, select independent evaluation and state program reports were chosen to provide evidence for states that have not yet published results in peer-reviewed journals.

These individual study summaries are organized in alphabetical order. Section 2 contains the study reference, the state and time period examined, an indication as to whether the study was peer-reviewed, the outcome measures chosen by the evaluators, and the major findings. The Centers for Disease Control and Prevention's (CDC) Office on Smoking and Health (OSH) maintains a collection of the hard copies of each study and will continue to collect and update this evidence on an annual basis.

- **Sections 3–7:** These tables organize the results according to *major outcome indicators* used by evaluation studies. The major outcome indicators are *mortality* (Table 1), *prevalence* (Table 2), *consumption* (Table 3), *cessation* (Table 4), and *smoke-free policies* (Table 5). These tables are referred to as the “Navigational Guide” on the Web-based version of this report because they contain links to each study summary.
- **Reference List:** A full citation for each study is provided. Many citations include Web addresses if the report is available online.

Availability and Use

These summaries can be used to provide evidence that comprehensive state tobacco control programs are effective in reducing tobacco use and tobacco-related disease in the population. As more states begin to develop comprehensive programs, the evidence base will grow. As some state programs mature, we can begin to assess long-term impacts. Additionally, as state programs experience budget cuts, it is important to evaluate the effects of eliminating or scaling back programs that were effective when they were funded at CDC-recommended levels.

This summary is also available on CDC's Tobacco Information and Prevention Source (TIPS) Web site at <http://www.cdc.gov/tobacco/sustainingstates/index.htm>, both in downloadable format and as a navigational version with links from the outcome indicator tables to the individual study summaries. (Please note that the Web-site data may be organized differently from this report; however, the information is essentially the same.) In addition, other key publications like *Data Highlights 2004*, *Sustaining State Funding for Tobacco Control—The Facts*, and *Research Synopsis of State Tobacco Control Programs* provide working templates that can be tailored to any state. The Web site will also contain the annual updates to this summary, such as new evaluation studies or reviews that will be added in the future.

Evaluation Results Organized by Outcome Indicators

Sections 3–7 organize the major evaluation findings by outcome indicators. Tables 1–5 list the evidence from evaluation studies relating to each of five major evaluation outcome indicators: mortality (Table 1), prevalence (Table 2), consumption (Table 3), cessation (Table 4), and smoke-free policies (Table 5). Tables are organized by subcategory (if applicable), and within each subcategory, the most recent evidence is listed first. Other short-term or intermediate outcome indicators, such as awareness of media campaigns, public attitudes towards smoke-free policies, or health care provider behavior, are not included in outcome tables but are included in the individual study summaries (Section 2) when they were included in the evaluation.

Studies may be listed more than once in Tables 1–5 because they often present more than one type of out-

come evidence. For example, evaluators may have examined both consumption data and prevalence rates in order to assess the effect of the tobacco control program in the state. Statistical testing is referenced when available (odds ratios, *p* values, etc.). The State column indicates which state program was evaluated, although some studies examined the United States as a whole or specific groups of states. The time frame refers to the time period the evaluation examined, while the single year after the authors' names refers to the year of publication of the article or the release of the report.

For more detailed information about a particular study, refer to the full summary (Section 2) or the original study (see the Reference List for the full citation). Within the tables, studies with an asterisk (*) are state or independent evaluation reports and are not published in peer-reviewed journals.

1

Recent Reviews □

The conclusions of recent major reviews of comprehensive state programs are summarized in Section 1. The major studies in these reviews were identified and subsequently used for Section 2. Elements of listed program components were taken from the review articles and do not necessarily indicate the full scope of the programs.

Siegel, 2002

States: California, Massachusetts, Arizona, Oregon, Florida

Program Components: Comprehensive state programs

Major Findings: Media campaigns are the most critical component of successful state programs, and suspending campaigns and limiting their aggressiveness have resulted in reversals of consumption trends. Intervening at the local level is critical to success, especially in passing smoke-free policies. Such policies are crucial to state programs because they protect the public from secondhand smoke, increase cessation, and reduce consumption. Campaigns that expose tobacco industry marketing techniques are demonstrably more effective in reducing initiation.

California

Program Components: Dedicated excise tax, media campaign, smoke-free policies

Major Findings: Proposition 99 (passed in 1988) resulted in a significant decline in consumption and prevalence among adults compared with the rest of the country; the media campaign in particular was effective in reducing consumption beyond the effect of the tax increase. When funding for the program and the media campaign was cut, however, declines in consumption also slowed. Proposition 99 also led to the proliferation of local smoke-free policies, with more than 75% of indoor workers reporting smoke-free work sites. Reduced heart disease mortality (33,000 lives saved) within 1–3 years of the program's inception was shown.

Massachusetts

Program Components: Dedicated excise tax, media campaign, smoke-free policies

Major Findings: Question 1 (passed in 1992) was associated with a significant reduction in consumption and adult prevalence. Evidence suggests that youth exposure to media campaigns may be linked with lower rates of progression to established smoking. Local smoke-free policies, including smoke-free restaurants, have proliferated, and more than 75% of private sector indoor workers report smoke-free work sites.

Arizona

Program Components: Dedicated excise tax, limited media campaign for youth and pregnant women

Major Findings: Proposition 200 (passed in 1994) and resultant price increases resulted in reduced per capita consumption (PCC), but no rigorous studies on adult or youth prevalence have been completed. A comparison of adult and youth trends with national data suggests prevalence may have decreased because of Arizona's program. Proposition 200 appears to have accelerated the development of local smoke-free policies.

Oregon

Program Components: Dedicated excise tax resulting in comprehensive program

Major Findings: Measure 44 (passed in 1996) has been linked with a significant decrease in consumption, above

that expected from price elasticity[†] estimates, suggesting that components of the tobacco control program other than the tax increase are responsible. No published analyses have examined prevalence, but Behavioral Risk Factor Surveillance System (BRFSS) evidence suggests that prevalence might have declined as a result of the program. Preliminary evidence suggests that declines in youth prevalence may be due to varied implementation of programming, but further analysis is needed to verify that reductions are attributable to the program. In 1997 the first local smoke-free restaurant ordinances were established.

Florida

Program Components: Youth-focused “truth” campaign

Major Findings: The Medicaid Fraud suit (settled in 1997) resulted in funding for the “truth” media campaign focused on youth. Within 2 years of program implementation, youth smoking prevalence dropped significantly in middle school and high school youth, whereas rates increased in other states. Studies have also linked reported exposure to the truth campaign with decreased initiation for up to 2 years and showed a dose-response relationship between awareness and initiation risk. State preemption laws have precluded local smoke-free policies.

Institute of Medicine, 2000

States: California, Massachusetts, Oregon, Washington, Florida, Arizona

Program Components: Counteradvertising/education, smoke-free environments, taxation, cessation, youth access

Major Findings: Multifaceted programs reduce tobacco use, and a dose-response effect exists between programming intensity and declines in consumption. Effects of counteradvertising depend on intensity and dose. Smoke-free work sites reduce illness and death from secondhand smoke, increase cessation, and reduce consumption among continuing smokers. Raising excise taxes decreases smoking prevalence and increases state revenue. Cessation programs are cost effective. To be effective, youth access restrictions require maximum retailer compliance.

Wakefield & Chaloupka, 2000

States: California, Massachusetts, Arizona, Oregon, Florida

Program Components: Comprehensive state programs

Major Findings: Critical to program success are the extent of funding and the degree to which it is undermined by the tobacco industry and other funding competitors. Prices influence adolescent and adult tobacco use; the addition of tobacco control programs reduces consumption more than would be expected by price increases alone. Programs are associated with a decrease in adult prevalence (California, Massachusetts, Oregon; Arizona and Florida data not yet available). Because programs focus more on youth, the effects on adult prevalence are not yet known. Early evidence shows that programs can reduce youth smoking. Although youth prevalence rose across the rest of the United States in 1993–1996 (29% increase in grade 8 and 23% in grade 10), the comparable rates in California were less (16% and 6%, respectively). Massachusetts reported a similar experience; Florida reported greater relative declines than national trends in 30-day prevalence for middle and high school students in February 1998–1999.

[†] Price elasticity is the percentage change in demand resulting from a 1% change in consumer price. For example, a price elasticity of cigarette demand of -0.4 means that a 1% increase in price causes a 0.4% reduction in demand.

2

Major Evaluation Summaries

Section 2 summarizes the major evaluation studies that were included in the review articles, published since the review articles, or are unpublished state or independent evaluation reports. Studies are ordered alphabetically by citation (authors and year published or released). After the study citation, the state and time frame of the evaluation are listed, followed by an indication as to whether the study was published in a peer-reviewed journal. For more complete information and additional statistical details, see the outcome indicator tables (Tables 1–5) or the specific articles (see the Reference List).

Abt Associates, Inc., 2000

Massachusetts, 1994–2000

Peer Review: No

Evaluation Outcome Indicators: Per capita consumption (PCC), adult, youth, and pregnant women prevalence, smoke-free environments, attitudes, cessation

Major Findings: PCC decreased by 36% compared with 16% in other states (minus California). Adult prevalence decreased from 22.6% to 17.9%, which was a greater decrease than in other states (minus California), even after accounting for demographic changes. Most of this decrease was attributed to males, who decreased consumption 1.6% annually from 25.1% in 1990 to 19.6% in 1999 ($p = 0.02$) compared with a 0.8% annual increase nationally among men ($p = 0.02$ for comparison). Smoking by pregnant women fell from 25% to 11%, the largest decrease in the United States. Youth prevalence decreased from 36% to 30% in 1995–1999 while remaining stable nationwide. Smokeless tobacco use by high school males decreased 50% from 17% in 1993 to 8% in 1999. Exposure to secondhand smoke fell at work from 44% to 29%, at home from 28% to 18%, and at restaurants from 64% to 39%. Retailer compliance with youth access restrictions increased sharply from 53% to 90%. Public support for smoking bans increased as well as knowledge of the harms of secondhand smoke; both nonsmokers (96.0%) and smokers (91.2%) believe that secondhand smoke can harm children. State and local laws, new taxes, and advertising restrictions have followed program implementation. The quit success rate increased from 17% in 1993 to 25% in 1997–1999, showing that smok-

ers who attempted to quit were more likely to succeed with the comprehensive program in place.

Arizona Department of Health Services, 2003

Arizona, 1997–2000

Peer Review: No

Evaluation Outcome Indicators: Youth prevalence

Major Findings: High school youth smoking rates in Arizona declined 21% from 31.3% in 1997 to 24.6% in 2000. Nationally, the high school smoking rate in 2000 was 34.5%, but these rates are not comparable because an insufficient number of Arizona high schools was surveyed. Among middle school students, smoking rates declined 39%, from 18.7% in 1997 to 11.4% in 2000, compared with 15.1% nationally in 2000.

Bartosch & Pope, 2002

Massachusetts, 1999

Peer Review: Yes

Evaluation Outcome Indicators: Local tobacco control policy

Major Findings: When multiple indicators of communities were considered (social and political demographics), state-level funding to local programs was strongly and significantly associated with the enactment of local tobacco control policies. City size was also associated such that very small towns were less likely to have the capacity to help enact policies. No other city characteristics were significantly associated with enactment of local policies.

Bauer et al., 2000

Florida, 1998–2000

Peer Review: Yes

Evaluation Outcome Indicators: Youth prevalence, intentions, and behaviors

Major Findings: Changes in cigarette use prevalence in the 1998, 1999, and 2000 surveys were examined among middle school students (MSS) and high school students (HSS). Current use significantly declined 40% in MSS (18.5% to 11.1%; $p < 0.001$) and 18% in HSS (27.4% to 22.6%; $p = 0.01$). Frequent use decreased significantly from 5.4% to 2.9% ($p < 0.001$) among MSS and 13.5% to 10.4% ($p < 0.001$) in HSS. Never users increased significantly from 56.4% to 69.3% ($p < 0.001$) in MSS and from 31.9% to 43.1% ($p = 0.001$) among HSS. Experimenters decreased from 21.4% to 16.2% ($p < 0.001$) in MSS and 32.8% to 28.2% ($p < 0.001$) in HSS. Current use decreases were significant in all subgroups except non-Hispanic black HSS, who had the lowest current smoking prevalence of any group. Among never users, those reporting a commitment to not smoke increased significantly from 67.4% to 76.9% ($p < 0.001$) among MSS and 73.7% to 79.3% ($p < 0.001$) in HSS; increases were seen for all subgroups except for non-Hispanic white HSS. Among experimenters, those reporting their intention to not smoke again increased significantly from 30.4% to 42% ($p < 0.001$) in MSS and 44.4% to 51% ($p < 0.001$) in HSS from 1998 to 2000.

Biener et al., 2000

Massachusetts, 1993–1999

Peer Review: Yes

Evaluation Outcome Indicators: Per capita consumption (PCC), adult prevalence

Major Findings: PCC declines were similar in Massachusetts (15%) and the United States (minus Massachusetts and California; 14%) from 1988 to 1992, an annual rate of decline of around 3%–4%. In 1993 (program implementation), PCC continued to decline in the rest of the country (minus California) at 4% but dropped 12% in Massachusetts in response to the tax increase. Because of the national tobacco industry price decreases in 1993, the national PCC decline slowed to 1% annually until 1997 (last year national data were available),

whereas the Massachusetts decline remained at 4% annually until 1999. Similarly, the adult prevalence rate slope for 1992–1999 for comparison states (40 states that participate in the Behavioral Risk Factor Surveillance System [BRFSS]) was 0.03% (95% CI[†] = –0.06% to 0.12%) per year, not statistically different from zero. The rate in Massachusetts was –0.43% (–0.66% to –0.21%) per year, a significant decline compared with the rest of the United States ($p < 0.001$).

California Department of Health Services, 2000

California, 1989–1999

Peer Review: No

Evaluation Outcome Indicators: Per capita consumption (PCC), youth prevalence, costs, cost savings

Major Findings: There were 1 million fewer smokers than would have been expected before Proposition 99 (using BRFSS trend data from 1984–1998). PCC has fallen by more than 50% since Proposition 99 was passed (in 1988), reaching a low of 61.3 packs/adult in 1998–1999 versus the U.S. PCC rate of 106.8 packs/adult in 1999. Taking into account direct medical costs alone, the California Tobacco Control Program saved an estimated \$3.01 billion, or \$3.62 for every dollar spent on the program. An additional \$5.4 billion was saved in indirect costs. Youth prevalence declined 43% from 12.1% in 1995 to 6.9% in 1999. Much of this decrease was likely due to the 40% increase in cigarette price that occurred in California in 1999; prevalence decreased 35.5% in 1998–1999 alone. California data show that in 1996–1999, the 30-day prevalence rate decreased 45% in California and 15% in the rest of the United States in grade 8. Similarly, prevalence in grade 12 declined 13% in California compared with 5% in the rest of the United States in 1997–1999.

CDC, 2001

Arizona, 1996–1999

Peer Review: Yes

Evaluation Outcome Indicators: Adult prevalence, health care provider behavior

Major Findings: After implementing the 1994 tax increase, a comprehensive program was established in

[†]95% CI = 95% confidence interval.

1995. Smoking prevalence dropped significantly from 23.1% in 1996 to 18.3% in 1999. Rates declined among men (25.3% to 19.7%), women (21.3% to 16.9%), whites (23.4% to 19.1%), and Hispanics (21.9% to 13.7%). The greatest decline among income groups was for those making less than \$10,000/year (31.2% to 22.8%). Increases occurred in the proportion of smokers reporting health professionals asking about tobacco (30.9% to 43.7%) and asking about tobacco plus advising them to quit (25.7% to 36.7%). Increases also occurred in the proportion of smokers reporting dentists asking about and advising against tobacco use (9.9% to 24.9%). Cross-sectional studies cannot link outcomes to a program nor differentiate between the tax and price increases and program components.

CDC, 2000

California, 1988–1997

Peer Review: Yes

Evaluation Outcome Indicators: Mortality (lung cancer)

Major Findings: Surveillance, Epidemiology, and End Results (SEER) data from 5 states and 3 metropolitan sites (representing 9.5% of the U.S. population, excluding California) were compared with the California cancer registry and California SEER data for lung and bronchus cancers. During 1988–1997, age-adjusted lung cancer rates in California declined significantly compared with stable incidence rates for SEER data sites. During 1991–1997, California lung cancer rates declined from 68 per 100,000 to 60.1, for an estimated annual percentage change (EAPC) of -1.9% per year ($p < 0.01$) from 1988 to 1997. In contrast, the non-California SEER rate decline was not significantly different from zero (-0.4%). Overall, California incidence rates decreased 14% from 1988 to 1997, whereas non-California SEER rates declined 2.7%. For men, the decline in California (EAPC = -2.9% ; $p < 0.01$) was 1.5 times greater than for the decline in SEER regions (EAPC = -1.8% ; $p < 0.01$) in 1988–1997. For women, rates declined 4.8% (EAPC = -0.6% ; $p < 0.01$) in California but increased 13.2% in non-California SEER regions (EAPC = 1.5; $p < 0.01$) in 1988–1997.

CDC, 1999

Oregon, 1993–1998

Peer Review: Yes

Evaluation Outcome Indicators: Per capita consumption (PCC)

Major Findings: Cigarette sales data in Oregon and the United States (minus Arizona, California, and Massachusetts) were compared 1 year before and 2 years after implementation of an Oregon state program. In 1993–1996, PCC increased 2.2% in Oregon and decreased 0.6% in the United States. In 1996–1998, PCC in Oregon decreased 11.6% (from 92 to 82 packs) despite a 2.6% increase in the state population. In the United States in 1996–1997, PCC decreased 1% (from 93 to 92 packs). Using a price elasticity of -0.4% , a price increase of 15.8% (as was the Oregon tax increase of \$.30 to \$.68) can be expected to reduce PCC by 6.3%. Because the decline in Oregon was 11.6%, it is likely that implementing the comprehensive state program resulted in reduced PCC above the tax effect.

CDC, 1996

Massachusetts, 1990–1996

Peer Review: Yes

Evaluation Outcome Indicators: Per capita consumption (PCC)

Major Findings: After a tax increase in Massachusetts, PCC decreased 19.7% in Massachusetts and 6.1% in the United States (minus California) in 1992–1996. After tobacco industry-wide price decreases in 1993 that brought real prices back to pretax increase levels, PCC continued to decrease in Massachusetts while remaining constant in the United States (minus California). This reduction cannot be accounted for by cross-border purchasing. Thus, the media campaign is likely to be responsible for the decreased PCC because price estimates alone would suggest increasing consumption. This study suggests that a media campaign can be more effective in reducing PCC than a tax increase alone.

Chen et al., 2003

California, 1990–1999

Peer Review: Yes

Evaluation Outcome Indicators: Youth prevalence

Major Findings: Modeling that estimates the effects of age, time period, and the cohort on youth smoking trends in California from 1990 to 1999 was used to estimate change in never smoking among California youth ages 12–17 years. For cohorts born in 1978 and after (i.e., were 12 years or younger when the California program began), there was an increase in the proportion of never smokers. During the decade, the proportion of never smokers increased for both boys (60% in 1990 to 69% in 1999) and girls (66% in 1990 to 70% in 1991). As all cohorts aged, the estimated effect of the program declined as smoking initiation increased with age. The authors conclude that the California program may have prevented the onset of smoking in youth for those born after 1978.

Elder et al., 1996

California, 1980–1994

Peer Review: Yes

Evaluation Outcome Indicators: Per capita consumption (PCC)

Major Findings: The average quarterly decline in PCC was 3.6% in California and 2.4% in the rest of the United States in 1980–1988 and 7.9% in California and 3.2% in the rest of the country in 1989–1994. This reduction occurred despite declining major brand sales in favor of generics and demographic shifts that would predict greater smoking in California.

Farrelly et al., 2003

United States, 1981–2000

Peer Review: Yes

Evaluation Outcome Indicators: Total consumption

Major Findings: Data on state aggregate cigarette sales, state and federal excise taxes, and state-level expenditures on tobacco control programs were used; potential confounders were addressed by trend analyses taking into account changes in excise taxes, cross-

border cigarette sales, and other state-specific factors such as unemployment and disposable income. Well-funded long-term state programs reduce tobacco use, and cumulative expenditures continue to affect cigarette consumption. Consistently well-funded programs show more dramatic declines over time than what would be expected from analysis of current or past program funding. One key simulation finding was that if states had funded at the CDC-recommended level of \$6 per capita, consumption nationally would have declined by as much as an additional 9% by 2000, thereby doubling the existing rate of decline in sales.

Farrelly et al., 1999

United States, 1992–1993

Peer Review: Yes

Evaluation Outcome Indicators: Prevalence, average daily consumption (ADC)

Major Findings: In a nationally representative cross-sectional sample of indoor workers with extensive demographic control variables, comprehensive workplace smoking bans (common and work areas) were associated with a 5.7% reduction in smoking prevalence and reduced daily consumption among remaining smokers by 2.7 cigarettes when compared with no smoking restrictions. Having work-area bans but allowing smoking in common areas reduced these effects by half. A partial smoking restriction in these areas was not associated with reductions in prevalence but with a 0.5 reduction in daily consumption. Comparisons of complete smoking bans with no smoking bans showed larger declines in ADC (–3.4 cigarettes) for older workers (ages 40–65; highest ADC) than for younger workers (–1.72 cigarettes for ages 18–24; lowest ADC), with ages 25–39 in between. Declines in prevalence were not as systematic among age groups: 7.8% for ages 18–24, 4.5% for ages 25–39, and 6.2% for ages 40–65 years. Workers with less education than a high school diploma had the largest decline in ADC (–3.9 cigarettes); the decline in ADC for college graduates was –1.7 cigarettes. In industry groups, groups with highest prevalence (wholesale and retail trade) benefitted most from the smoking ban: a 30.5% prevalence decreased to 22.6% (25.9% decline). Applying workplace bans to all work sites would result in an additional 2.6 percentage points (10% decline) and a 7% decline in ADC among continuing smokers.

Fichtenberg & Glantz, 2002

United States, varies (review article) □

Peer Review: Yes □

Evaluation Outcome Indicators: Per capita consumption (PCC), adult prevalence □

Major Findings: Smoke-free work sites are associated with reduced smoking prevalence by 3.8% and reduced consumption among continuing smokers of 3.1 fewer cigarettes per day. Enacting policies in all U.S. workplaces that do not yet have them would result in a 4.5% decrease in PCC, the equivalent of raising excise taxes from \$0.76 to \$1.11.

Fichtenberg & Glantz, 2000

California, 1980–1998

Peer Review: Yes

Evaluation Outcome Indicators: Mortality (heart disease)

Major Findings: Before 1989, the age-adjusted heart disease mortality rate in California was about two-thirds that of the United States. The introduction of the California Tobacco Control Program was associated with a significantly greater annual rate of decline (by 2.93 deaths/year/100,000). After program funding was reduced in 1992, the rate of decline slowed (by 1.71 deaths/year/100,000) but was still significantly greater than that of the United States. The program was thus associated with 33,000 fewer deaths in 1989–1997 (a total of 611,500 deaths during this period); the campaign cutback in 1992 was associated with 8,300 excess deaths in 1993–1997. Changes in mortality mirrored changes in PCC: before 1989, PCC declined slightly faster than in the United States; after 1989, PCC accelerated to -2.72 packs/year. After 1992 the decline was significantly reduced by $+2.05$ packs per year ($p < 0.04$), compared with the period from 1989–1991.

Gallup Organization, Inc., 2003

Maine, 1994–2001

Peer Review: No

Evaluation Outcome Indicators: Per capita consumption (PCC), adult and youth prevalence

Major Findings: Since the start of the Partnership for a Tobacco-Free Maine (PTM) and an increase in tobacco tax from \$0.34 to \$0.74 in 1997, the PCC decline has more than tripled its previous rate of decline; however, it remains above other states with aggressive state tobacco control campaigns. PCC declined 19% from 132.8 packs/year in 1997 to 107 packs/year in 2000. Adult prevalence remained consistently higher than the national average for most of the 1990s. The biggest drop in adult prevalence occurred in 1996–1997, and the decrease continued until 1998. For high school students, last 30-day prevalence increased from 1993 to 1997 but decreased from 39.2% to 38% in 1997 and to 24.8% in 2001. Media coverage of PTM has significantly increased since it began. The establishment of public smoke-free places has increased. Tobacco sales to minors decreased from 44% in 1994–1995 to 7% in 2000–2001 according to Synar data.

Gilpin et al., 2001

California, 1990–1999

Peer Review: No

Evaluation Outcome Indicators: Per capita consumption (PCC), adult and youth prevalence, smoke-free policies, cessation

Major Findings: PCC was reduced by 57%, compared with 27% in the rest of the country (partially because of an 18.6% decline in daily smoking among continuing smokers). More than 60% of smokers smoke less than 15 cigarettes/day, and more than 20% of current smokers are nondaily smokers. Adult prevalence decreased to 17.5% but has remained stable since 1994. Proportions of smokers attempting to quit increased from 49% to 60%. Despite an increase in youth 30-day prevalence in 1993–1996, the 1999 rate of 7.7% was significantly lower than the 1990 rates. Youth committed to never smoking rose from 17.7% in 1996 to 65.7% in 1999. Perceived ease of buying a pack of cigarettes decreased significantly from 52% to 27%. Percentage of indoor workers reporting smoke-free policies increased from 35% to 93%. However, since 1996, nonsmokers reporting recent exposure to secondhand smoke in their work area increased from 12% to 16%. The percentage of California residents living in smoke-free homes was 73%, up 30% from 1993, including 88.6% of children and 47% of smokers.

Glantz, 1993

California, 1981–1992

Peer Review: Yes

Evaluation Outcome Indicators: Per capita consumption (PCC), total consumption

Major Findings: The rate of decline in total consumption (2% per year during 1981–1988) more than tripled in 1989–1991 after Proposition 99. In 1992 the decline decelerated after the media campaign was suspended and fell more slowly than it did before the campaign. PCC was decreasing at –4 packs/year before the campaign and doubled to –8 packs/year. In 1992 the decline slowed to –1.42 packs/year; this decline in PCC was not statistically different from the decline in the national rate as of 1993.

Harris, 1999

Massachusetts, 1990–1996

Peer Review: No

Evaluation Outcome Indicators: Pregnant women prevalence, cost savings

Major Findings: In 1990, the rate of reported smoking during pregnancy according to birth certificate data in Massachusetts was about 7 percentage points higher than the national rate (of those states that collect smoking data on birth certificates). The Massachusetts state program significantly decreased the rate of reported smoking during pregnancy in Massachusetts by 47.8% compared with 26.1% in the United States. The decrease in Massachusetts occurred during 1990–1996, but the largest 1-year drop was from 23.3% in 1992 to 16.5% in 1993, coinciding with the implementation of Question 1. By 1995, the Massachusetts rate was lower than the U.S. rate, and by 1996, it further declined to 13.2%. Because of a 3% decline in prevalence in current smoking, an estimated 140,000 fewer adults smoked in 1998. With established attributable risk calculations, an estimated \$85 million is saved annually in public and private expenditures (by attributing 2% of the decline in prevalence to the campaign). In the author's view, these estimates are conservative and the effect of the campaign may well be greater.

Hu et al., 1995a

California, 1989–1991

Peer Review: Yes

Evaluation Outcome Indicators: Total consumption, cigarette prices

Major Findings: Econometric models based on addictive substances showed that Proposition 99 reduced consumption 8%–9% in the short run and 10%–13% in the long run. Authors pointed out that a 25¢ tax increase resulted in retail prices 21.2% higher than before the tax increase because of increased tobacco industry prices during 1988–1990.

Hu et al., 1995b

California, 1990–1992

Peer Review: Yes

Evaluation Outcome Indicators: Per capita consumption (PCC)

Major Findings: Both the tax increase and the media campaign affected the decline in consumption in California. The price elasticity due to the tax increase was –0.30 and for the media campaign was –0.05 for 1989–1992. For the 30 months from the 3rd quarter 1990 through 4th quarter 1992, sales dropped by 35 packs/adult (> 15 years), with 79% of the reduction attributable to the price increase and 21% to the media campaign. Each reduced consumption in different ways: the tax provided economic disincentive, and the media education was directed at reducing demand.

Hu et al., 1994

California, 1984–1991

Peer Review: Yes

Evaluation Outcome Indicators: Per capita consumption (PCC)

Major Findings: One month after the implementation of Proposition 99, PCC decreased by 25.7%, or 2 packs/adult, part of this decrease being attributed to an overstocking phenomenon, when sales in the month preceding the tax increase were 10% higher than expected. This effect rapidly diminished and after 3 years remained at a

9.5% reduction rate. Also found was a significant impact of the 4¢ federal tax increase in 1991 (−0.28 packs/adult), which was accounted for in the above analyses.

Jemal et al., 2003

United States (33 states), 1990–1999

Peer Review: Yes

Evaluation Outcome Indicators: Mortality (lung cancer)

Major Findings: Rates of lung and bronchus cancers in young adults (ages 30–39) from 1990–1994 ($r = -0.54$; $p = 0.0013$) and 1995–1999 ($r = -0.80$; $p = 0.0001$) were highly inversely correlated with an index of tobacco control in the state. The index contains data on cigarette price and workplace and home smoking policies in 1992–1993. States were ranked; negative values are below the median and positive values are above the median. Excluding outliers (Kentucky, California, and Washington) had little effect on results. Notably, the correlation of index with lung cancer rates became substantially stronger in 1995–1999 than in 1990–1994. The index was also moderately correlated ($r = -0.56$; $p = 0.0008$) with percentage change in the death rate during the 1990s (as more states implemented programs). The index was highly inversely correlated with smoking prevalence for ages 30–39 years ($r = -0.81$; $p < 0.0001$) and highly positively correlated with percentage of former smokers ages 30–39 who had quit ($r = 0.82$; $p < 0.0001$).

Manley et al., 1997

United States, 1989–1996

Peer Review: Yes

Evaluation Outcome Indicators: Per capita consumption (PCC), tax policies, real prices of cigarettes

Major Findings: Early evaluation of the American Stop Smoking Intervention Study (ASSIST) showed PCC in ASSIST states (versus control states minus California) began to diverge significantly in 1994, and by 1996 achieved a 7% reduction. Both groups had a drop in real price in 1992–1993, but by 1994, prices in intervention states returned to 1992 levels, whereas prices were lower than 1992 levels in the control states (12.6¢ difference). Although no control state experienced a price increase

in 1992–1994, 55% still showed a decrease in PCC. Of 14 intervention states with a price decrease, 11 (76%) showed a decrease in PCC. The three intervention states that had price increases experienced decreases in PCC as predicted, and the three remaining control states had no significant decline in PCC. Process evaluation showed that only 40% of ASSIST states were able to increase taxes in 1993–1994, whereas one-third of the control states raised taxes during that time. The slope of the regression for effect of real price on PCC for intervention states shows a diminished effect of price, suggesting that elasticity of demand may be different when the program is in place.

McMillen & Baldwin, 2003

Mississippi, 1998–2002

Peer Review: No

Evaluation Outcome Indicators: Youth prevalence, knowledge, and attitudes

Major Findings: From 1999 to 2002, current (past 30 days) smoking in public middle school students (MSS) declined from 23% to 11.9% while declining among public high school students (HSS) from 32.5% to 23.1%. In both groups, the declines from 2000 to 2002 were statistically significant. Overall, since program implementation, current smoking declined 42% in MSS and 24% in HSS. Although male HSS showed a significant decline from 33.9% in 1998 to 25.1% in 2002, the female HSS decline from 27.1% in 1998 to 21.1% in 2002 was not statistically significant. Similarly, frequent smoking (> 20 of last 30 days) declined significantly for male HSS from 17.3% to 10.4%, whereas the female HSS decline of 11.6% to 7.8% was not significant. Ever-smoking rates for male (78.7% to 64%) and female (72.6% to 59.3%) HSS declined significantly from 1998 to 2002. For MSS, current-smoking rates declined significantly for both males (23% to 12.1%) and females (18.2% to 11.5%) from 1998 to 2002. Frequent smoking in MSS declined significantly for males (6.8% to 3.2%) but not for females (3.6% to 2.2%). Ever smoking declined significantly for male and female MSS. Ever-smoking rates for grades 8–12 declined significantly from 1998 to 2002.

McMillen et al., 2003

Mississippi, 2000–2002

Peer Review: No

Evaluation Outcome Indicators: Adult knowledge, attitudes

Major Findings: Many attitudes regarding tobacco use and smoke-free environments showed significant improvement among adults. Universal beliefs (> 85%) were that children should not smoke, adults should not smoke around children, and parents' secondhand smoke harms children. Significant improvement was made from 67.6% in 2000 to 80.8% in 2002 in the belief that schools should prohibit clothing or goods with tobacco logos. Support for tobacco regulation as a drug increased significantly from 67.9% in 2000 to 73.2% in 2002, compared with 63.7% and 66% for the United States. Those reporting a smoking ban at all work areas rose significantly from 53.2% in 2000 to 64.7% in 2002, compared with 65.7% and 65% for the United States. Adults reporting strictly enforced tobacco policy at the workplace increased from 72.3% in 2000 to 85.4% in 2002, compared with U.S. rates of 78% and 80.7%. Less than 20% reported employers offering a cessation program in the last 12 months in all years. Although 85% of Mississippi adults believe that smoking cigarettes is very dangerous, 76.9% believe that cigars, 75.3% believe that snuff, and 72.5% believe that chewing tobacco is very dangerous. None of these rates changed significantly from 2000 to 2002. In the United States, these same beliefs increased in the same time period to rates comparable with that of Mississippi. State respondents were less likely than U.S. respondents to report smoke-free restaurants, bars/taverns, convenience stores, indoor shopping malls, or outdoor parks but were similarly likely to report believing that these should be smoke-free venues.

Meshack et al., 2003

Texas, 2000–2002

Peer Review: No

Evaluation Outcome Indicators: Adult awareness and use of cessation services, adult prevalence

Major Findings: The effects of the Texas Tobacco Prevention Pilot Initiative (TTPPI), which randomly assigned interventions to regions to assess effectiveness,

are summarized. Regions 5 and 6 received intensive pilot activities, and adults reported more awareness (23.1% vs. 13.8%) and use (2.7% vs. 1.2%) of telephone counseling services and higher rates of cessation (11% vs. 9.5%). Cessation differences were due mainly to differences among women. No significant differences in prevalence occurred among the regions in 1999, but at the end of the initiative, declines in pilot areas were twice as large as declines in nonpilot areas (5.1% vs. 2.5% absolute percent reduction, 21% vs. 11% relative reduction). Estimates are that there were about 90,000 fewer smokers than if TTPPI had not been implemented. An experimental evaluation of the telephone counseling service provided by the American Cancer Society compared 1,014 callers (of total 12,500) who randomly received booklets and the new telephone counseling service with those who received self-help booklets. Receipt of telephone counseling led to significantly higher 1-year cessation rates (20.7% vs. 13.2%), not taking into account loss to follow-up. Conservatively assuming that those lost to follow-up were still smoking halves success rates, but rates are still significantly different. Effects among young adults (18–25 years) were also assessed; 1-year follow-up cessation rates were 36% for counseling and booklets versus 11% for booklets only.

Norman et al., 2000

California, 1998

Peer Review: Yes

Evaluation Outcome Indicators: Smoke-free policies (in homes), average daily consumption

Major Findings: This cross-sectional survey assessed smokers' exposure to California state tobacco control messages as well as behaviors. Smokers with a home indoor smoking ban were twice as likely (adjusted odds ratio [AOR] = 2.27; 95% CI = 1.23, 4.21) to have heard of community programs to encourage home and car restrictions and were almost 3 times as likely to have seen and talked about a secondhand smoke TV ad (AOR = 2.87; 95% CI = 1.11, 7.41), after adjustment for demographic factors. Just seeing the "Baby Blocks" ad alone was not associated with smoking restrictions or a ban; 6% of smokers saw and talked about the ad; of those, 53.8% had a total home smoking ban, compared with 40.1% of smokers who did not recall seeing the ad. In multivariate models controlling for demographics and

attitude toward secondhand smoke, having a full smoking ban was significantly associated with average cigarettes smoked per day ($p < 0.01$) and desire to quit smoking (odds ratio [OR] = 2.16; 95% CI = 1.26, 3.7).

Oregon Department of Human Services, 2003

Oregon, 1996–2003

Peer Review: No

Evaluation Outcome Indicators: Per capita consumption (PCC); adult, youth, and pregnant women prevalence; smoke-free environments

Major Findings: PCC decreased by 30%, more than that of other U.S. states (minus Arizona, California, Massachusetts, Oregon). Adult smoking prevalence decreased 13% from 23.4% to 20.4%, compared with an 8% decrease in the United States. Smoking by pregnant women fell 28% and saved an estimated \$1.3 million in caring for low-birth-weight infants. Smokeless tobacco use declined 48% among men, from 9.4% to 4.9%. Youth smoking prevalence declined 47% for grade 8 and 26% for grade 11, the latter of which is lower than the U.S. rate. Smokeless tobacco use among teens also declined; use dropped 45%, from 22.7% to 12.5%. More than 95% of work sites are now covered by smoke-free law. Homes with smoke-free policies increased from 71% to 81% and to 95% of homes where women had recently given birth in 2000.

Pierce et al., 1998a

California, 1989–1996

Peer Review: No

Evaluation Outcome Indicators: Per capita consumption (PCC), adult and youth prevalence, smoke-free environments

Major Findings: In 1989–1993, adult prevalence and PCC declined over 50% faster than previously in California and over 40% faster than rest of the United States. In 1993–1996, declines slowed to rates slower than the previous period, with declines in prevalence similar to U.S. declines, whereas U.S. PCC remained constant. Additionally, even though prevalence declines leveled

off in California in 1993–1996, because of a greater decline in average daily consumption among continuing California smokers relative to the country, PCC continued to decline in California. From 1989 to 1996, an estimated 2 billion fewer packs were sold in California, a cost to the tobacco industry of \$3 billion in lost sales. Despite high awareness of media campaigns, youth smoking remained stable in 1989–1993 but increased 26% in 1993–1996. Indoor workers having smoke-free workplaces increased nearly 160%, from 35% in 1990 to more than 90% in 1996. In 1990–1996, indoor workers exposed to secondhand smoke at work decreased from 29% to 11.7%. For children, exposure to secondhand smoke at home decreased 55% from 29% in 1992 to 13% in 1996.

Pierce et al., 1998b

California, 1989–1996

Peer Review: Yes

Evaluation Outcome Indicators: Per capita consumption (PCC), adult prevalence

Major Findings: Early program implementation (1989–1993) was associated with a 52% more rapid decline in PCC than previously recorded in California (from 9.7 packs/person/month in 1989 to 6.5 in 1993) and significantly greater than the decline in the rest of the country (12.5 to 10.4; $p < 0.001$). In 1994–1996, California's rapid decline in PCC slowed to 28% of the 1989–1993 decline (and 40% of the preprogram number) while the U.S. decline halted. By 1996 an average of 6 packs/person/month was sold in California versus 10.5 in the United States. Before the California program was implemented, adult prevalence was declining at about the same rate (0.74% per year) as the country (0.77%). After program implementation, the rate of decline in California prevalence accelerated to 1.06% per year while slowing in the rest of the country to only 0.56%; thus, the rate of decline in California was nearly 90% greater than in the United States in 1989–1993 ($p < 0.05$). The prevalence rate decline was significantly greater in 1990–1993 than in 1993–1996 for both California and the United States. The authors concluded that the decline in PCC cannot be explained by tax increase alone and that other program elements had an effect.

Popham et al., 1998

California, 1990–1991

Peer Review: Yes

Evaluation Outcome Indicators: Cessation

Major Findings: The effects of a media campaign on cessation were qualitatively measured by asking smokers what helped them quit. Quitters were asked to recall three experiences that helped them to quit; 6.7% of them indicated advertisements (radio, TV, billboard) in uncued questions. When asked directly about the media campaign, 34.4% of respondents indicated that the ads had played a role in their decision to quit. Estimates are that for 33,000 former smokers in California who quit in 1990–1991, the media campaign played a large part in their decision to quit, whereas for an additional 140,000, it played at least some part.

Porter, 2000

Arizona, 1996–1999

Peer Review: No

Evaluation Outcome Indicators: Adult prevalence, smoke-free environments, knowledge, health providers' behavior

Major Findings: Adult smoking rates declined 21% from 23.8% in 1996 to 18.8% in 1999. The 18–24 age group showed a 24% decrease from 27.5% to 21%. Hispanic smoking prevalence decreased from 23.5% in 1996 to 14.6% in 1999, the greatest reduction of any ethnicity group. For the 18–24 age group, age at first use increased from a median of 15 years in 1996 to 16 years in 1999. Reports of home smoking bans decreased significantly both for smokers (from 15.7% in 1996 and 6.9% in 1999) and nonsmokers (from 50.6% to 39.4%). However, the proportions of those reporting outdoor-only smoking restrictions increased significantly, from 32.2% to 41% among smokers and 30% to 43.9% among nonsmokers. Those reporting no home restrictions also decreased among both groups. Knowledge of health risks from secondhand smoke and smokeless tobacco use improved slightly, but less than 25% of respondents believed that tobacco is as addictive as “hard” drugs. Reported exposure to different antitobacco media messages changed from 1996 to 1999: significant increases included radio, from 38% to 43%, and billboards, from 40% to 55%; significant decreases included pamphlets,

from 41% to 36%; newspapers, from 47% to 41%; and magazines, from 47% to 44%. TV exposure remained stable at 79% and 78% and was the most common source of information for men and women and for all age and ethnicity groups.

Rigotti et al., 2002

Massachusetts, 1999

Peer Review: Yes

Evaluation Outcome Indicators: Young adult prevalence

Major Findings: In a public college sample in Massachusetts, students who were ages 11–17 years in 1993 and attended high school in Massachusetts during the state program had a 39% lower current tobacco use (last 30-day use) rate than did students who attended high school outside the state after adjustment for demographic factors (age, sex, race, parental educational attainment, college residence). However, there was no difference in current cigarette use between the two groups after adjustment for residence. Because nearly all students who lived at home in college resided in the state during high school, separate analyses were conducted for those not living with parents. For these students, both current tobacco and cigarette use were significantly lower for students who attended high school in state versus out of state, even after adjustment for controls (all tobacco use: AOR = 0.66; 95% CI = 0.45, 0.96; cigarette use: AOR = 0.58; 95% CI = 0.40, 0.87; $p < 0.01$).

Rohrbach et al., 2002

California, 1996–1998

Peer Review: Yes

Evaluation Outcome Indicators: Adult and youth prevalence, smoke-free policies

Major Findings: Recall of exposure to multiple program components including media, community programs, and school programs was assessed. The unit of analysis was the county, and two cross-sectional observations were made in 1996 and 1998. Multicomponent exposure was significantly associated with reductions in adult prevalence, increases in home smoking bans, and reductions in perceived violations of workplace no-smoking rules over time ($p < 0.05$ for all). Although

youth (grade 10) showed significant reductions over time from 27.4% to 21.8% in last 30-day smoking prevalence and in reported secondhand smoke exposure from 65.9% to 58.2% ($p < 0.05$ for both), these reductions were not associated with exposure to program components.

Siegel & Biener, 2000

Massachusetts, 1993/1994–1997/1998

Peer Review: Yes

Evaluation Outcome Indicators: Youth initiation

Major Findings: Using a cohort design with a 4-year longitudinal follow-up, this study found that youth ages 12–13 years reporting exposure to television antismoking ads from a state program were half as likely to have progressed to becoming established smokers. No effect was found for youth ages 14–15 years. No effect was found for either age group for exposure to radio or outdoor (e.g., billboard) ads. This study controlled for many potential confounders including demographics, friends' and parental smoking, TV viewing, baseline susceptibility, and smoking status. Of eight potential mediators investigated, perceived prevalence of youth smoking was significantly related for ages 12–13 years such that those reporting exposure to television antismoking ads were more likely to have an accurate rather than inflated perception of youth prevalence.

Siegel et al., 1998

California, 1978–1994

Peer Review: Yes

Evaluation Outcome Indicators: Adult prevalence, quit ratio

Major Findings: In 1985–1990, a significant decline in adult prevalence occurred in California (–1.22% annually; 95% CI = –1.51, –0.93) and the rest of the country (–0.93% annually; 95% CI = –1.13, –0.73), compared with rates in 1978–1985. In 1990–1994, the rates in California slowed to –0.39% annually (95% CI = –0.76, –0.03) but leveled off in the rest of the United States (–0.05% annually; 95% CI = –0.52, +0.12). The quit ratio (ratio of former smokers to former plus current smokers) was similar in California and the country in all time periods (1978–1985, 1985–1990, and 1990–1994).

Sly et al., 2001

Florida, 1998–1999

Peer Review: Yes

Evaluation Outcome Indicators: Youth prevalence, ad awareness, knowledge, and attitudes

Major Findings: The effects of Florida's media campaign with the theme of tobacco industry manipulation and an aggressive governor-sponsored public service announcement deglamorizing smoking was compared with tobacco use indicators in control states that had no tobacco control program. Confirmed awareness (being able to describe the theme) of ads reached 93% by 1 year, with 89% of those reporting TV exposure; nationally, only 30% reported exposure to any TV ads. Regarding receptivity to ads, Florida youth rated the industry manipulation ads higher than the public service announcements (liking ads: 83% vs. 37%, talking with friends about ads: 34% vs. 10%, saying ads made them think about not smoking: 61% vs. 28%). Compared with youth in other states, Florida youth showed a higher awareness of antitobacco ads at baseline (54% to 41%) and higher confirmed awareness (32% vs. 6.1%). Two receptivity measures were twice as high in Florida, and the "talked with friends" measure was 6 times greater in Florida than in other states. For all youth combined and those younger than 16 years, significant declines occurred in cigarette use and susceptible nonsmokers, whereas comparable national rates either decreased less or increased. Among youth younger than 16, Florida declines were not significantly different from national rates except for the decrease in susceptible nonsmokers.

Soldz et al., 2002

Massachusetts, 1996–1999

Peer Review: Yes

Evaluation Outcome Indicators: Youth prevalence (lifetime and current use)

Major Findings: Cigarette, smokeless tobacco, and cigar use by middle and high school students was examined. Significant declines in 1996–1999 were noted for current use of all three types and for lifetime use of cigarettes and cigars (but not smokeless tobacco). Among middle school students, significant declines for lifetime and current use of cigarettes and cigars were noted, as

well as for lifetime smokeless tobacco use. High school students reported significant declines in current use of all three forms, but for lifetime use, only the decline in smokeless tobacco was significant. Differences by gender and race/ethnicity were also noted, as well as in grade 6 trends. (Grade 6 is not usually included in middle schools in Massachusetts.) For lifetime and current use of cigarettes, declines in Massachusetts were significantly greater than declines nationally or regionally for grades 6, 8, 10, and 12. However, for smokeless tobacco, rates were not different from those seen nationally or regionally (cigar use data not available nationally).

Stillman et al., 2003

United States, 1992–1999

Peer Review: Yes

Evaluation Outcome Indicators: Per capita consumption (PCC), adult prevalence, tobacco control policies

Major Findings: This was an evaluation of the American Stop Smoking Intervention Study (ASSIST). The strength of tobacco control (SOTC) index was created to reflect the extent to which states devoted resources to tobacco control programming and was measured for all intervention (ASSIST) and control states (minus California). The intermediate outcome variable—the initial outcomes index (IOI)—was a measure of policy change: the proportion of workers covered by smoke-free policies, cigarette real price, and local smoke-free policy ratings. After controlling for demographics and other state factors, the SOTC index was related to PCC but was not significantly related to adult prevalence after adjustment for person-level factors. Notably, the capacity component of the SOTC index was significantly and inversely related to PCC regardless of ASSIST status. Although in 1993–1994, ASSIST states showed greater increases in IOI, after adjustment for the entire 8 years, both ASSIST and non-ASSIST states showed an increase in policy changes (as measured by IOI). States with a greater increase in IOI (from the 25th to the 75th percentile) over the 8 years showed a decrease in PCC of 0.57 packs/person/month.

Washington State Department of Health, 2003

Washington, 1999–2002

Peer Review: No

Evaluation Outcome Indicators: Adult and youth prevalence

Major Findings: From 1999 to 2002 there was an 8% decrease in adult smokers. More smokers attempted to quit (26% in 2002) than before the launch of the program (15% in early 2000). Overall, last 30-day youth smoking decreased 40% in 1999–2002, and there was a 30% decrease in high school youth who have ever tried smoking. The reduction in prevalence among high school youth in 1999–2002 was twice the U.S. rate of decline.

Weintraub & Hamilton, 2002

Massachusetts, 1990–1999

Peer Review: Yes

Evaluation Outcome Indicators: Adult prevalence

Major Findings: In 1990 the difference between prevalence in Massachusetts and the rest of the United States (41 states that do BRFSS) was not significant, but by 1999, adult prevalence in Massachusetts (19.4%) was significantly different from other U.S. states (23.5%; $p < 0.001$). After adjustment for changes in demographic characteristics, prevalence declined 17% in 1990–1999 (OR = 0.83; 95% CI = 0.70, 0.99) while there was no change in the U.S. rate (OR = 1.01; 95% CI = 0.97, 1.05). For Massachusetts men in 1990–1999, a 27% decline in prevalence was significant (after adjustment for demographics), while for women a 5% decline was not significant. There were no significant differences in the United States in the same time period for men or women.

Willet et al., 2003

Nebraska, 2000–2003

Peer Review: No

Evaluation Outcome Indicators: Smoking bans, youth prevalence, cessation

Major Findings: Youth 30-day smoking prevalence declined significantly from 30.5% to 24.1% in 2001–2003, down from 39.2% in 1997 and 37.3% in 1999. A 30% increase occurred in youth reporting never having smoked a cigarette, from 30.5% in 1997 to 39.8% in 2003. Vendor compliance with youth access laws increased from 67.8% to 81.2% in 2003. From August 2002 to October 1, 2003, the quitline received more than 6,600 calls from people seeking cessation counseling/information; the proportion of callers who heard about the quitline from their physicians increased (about 4% overall). Additionally, the quitline reached its goal of reaching a lower-income socioeconomic group because 54% of callers reported household income of less than \$15,000. Awareness of dangers of secondhand smoke increased as did reports of home or workplace smoke-free policies. More than 70% (71.1%) of Nebraskans support local ordinances banning smoking in restaurants, although no city or county in Nebraska has a comprehensive ban for public places.

3

Tobacco-Related Mortality

Reducing tobacco-related morbidity and mortality are the long-term goals of tobacco prevention and control programs. Few states have had established comprehensive programs long enough to realize decreases in disease, but early data have shown decreases in mortality in states that have comprehensive programs. Because population subgroups experience differential rates of disease, it is important to examine and remedy disparities in mortality rates among all population groups.

Table 1A. Heart Disease Mortality

REFERENCE (STATE)	TIME FRAME	MAJOR FINDINGS
Fichtenberg & Glantz, 2000 (California)	1980–1988	Mortality declined faster in California than the rest of the United States; regression coefficient = 0.67 ($p < 0.001$).
	1988–1991	California’s age-adjusted heart disease mortality rate decline accelerated by $-2.93/100,000$ ($p < 0.001$) from the previous period.
	1992–1998	The rate declined further in California by $-1.22/100,000$ from the previous period ($p = 0.03$), which represents a reduced effect of 1.71 deaths per 100,000 population per year. Declines over the latter two time periods mean 33,000 heart disease deaths were prevented overall. An additional 8,300 deaths might have been prevented had the media campaign not been scaled back after 1992.

Table 1B. Lung Cancer Mortality □

REFERENCE (STATE)	TIME FRAME	MAJOR FINDINGS
Jemal et al., 2003 (United States)	1990–1994	An index of the strength of state tobacco control programs was negatively correlated with lung cancer death rates for adults ages 30–39: -0.54 ($p = 0.0013$).
	1995–1999	The correlation of an index of the strength of state tobacco control programs with lung cancer death rates for adults ages 30–39 strengthened to -0.80 ($p < 0.0001$). Overall correlation of the index with percent change in death rates for adults ages 30–39 from 1990–1999 was -0.56 ($p < 0.0008$).
CDC, 2000 (California)	1988–1997	There was a 2.7% total decline in non-California SEER [†] areas; the average annual decline of -0.4% is not significantly different from zero. There was a 14% total decline in lung cancer mortality in California; the average annual decline of 1.9% ($p < 0.01$) was 1.5 times that of non-California SEER areas. Among men there was a 2.9% average annual decline ($p < 0.01$) in California vs. a 1.8% average annual decline ($p < 0.01$) in non-California SEER areas. Among women, rates declined 4.8% (average annual decline of 0.6%, $p < 0.01$) in California, while rates increased 13.2% (average annual increase of 1.5%, $p < 0.01$) in non-California SEER areas.

[†]SEER = Surveillance, Epidemiology, and End Results, a program of the National Cancer Institute. The SEER program currently collects and publishes cancer incidence and survival data from 14 population-based and 3 supplemental cancer registries covering approximately 26% of the U.S. population. For more information, see <http://seer.cancer.gov>.

4 Prevalence of Tobacco Use

Prevalence is defined as the proportion of the population who report current tobacco use, and reducing prevalence among all population groups is considered an intermediate or long-term program goal. In adults, current smoking is usually defined as ever having smoked 100 cigarettes plus current smoking on some or all days. For youth, smokers are often defined as those who report any tobacco use in the last 30 days (“current smokers”) or those who report ever having tried cigarettes (“ever smokers”). Prevalence findings are organized by age sub-categories (adults, young adults, and youth) and indicate cigarette use, unless otherwise noted.

When prevalence declines are given, they are presented in absolute or relative terms. An absolute percentage change indicates the difference in actual percentage at two points in time, while a relative change measures the degree of change over time. For example, a decrease in prevalence from 20% to 15% is an absolute decrease of 5 percentage points and a relative decline of 25% $[(0.20 - 0.15)/0.20]$. These tables present what the authors have offered in their reports, often including both absolute and relative changes.

Table 2A. Adult Smoking Prevalence

REFERENCE (STATE)	TIME FRAME	MAJOR FINDINGS
Jemal et al., 2003 (United States)	1990–1999	An index of the strength of state tobacco control programs was highly negatively correlated with current adult smoking ($r = -0.81$; $p < 0.0001$).
Stillman et al., 2003 (United States)	1992–1999	Adjusted difference in prevalence between ASSIST [†] vs. non-ASSIST states was -0.63% (95% CI = -1.38% , 0.12% ; $p = 0.49$); for women it was -0.96% (-1.90% , -0.02% ; $p = 0.023$); for men it was 0.09% (-0.80% , 0.97% ; $p = 0.42$). A measure of change in tobacco control policy outcomes (initial outcomes index) was associated with declines in adult prevalence when the District of Columbia was removed from analyses (regression coefficient = -0.15 [-0.28 , -0.02 ; $p = 0.015$]).
Meshack et al., 2003* (Texas)	2000–2002	Declines in prevalence in pilot areas vs. control areas: absolute percentage declines of 5.1% (21% relative decline) vs. 2.5% (11% relative decline). There were an estimated 90,000 fewer smokers because of pilot programs.
Oregon Department of Human Services, 2003*	1996–2003	Overall prevalence declined from 23.4% to 20.4%, which is a 13% relative decline, compared with an 8% relative decline in United States. Among pregnant women there was a 28% relative decline, saving an estimated \$1.3 million in low-birth-weight care.

* Indicates a state or independent evaluation report that was not published in a peer-reviewed journal.

† ASSIST = American Stop Smoking Intervention Study.

REFERENCE (STATE)	TIME FRAME	MAJOR FINDINGS
Washington State Department of Health, 2003*	1999–2002	The program resulted in 83,000 fewer adult smokers, an 8% decline.
Biener et al., 2002 (Massachusetts)	1993–1999	The slope in Massachusetts declined at a rate of -0.44 per year (95% CI = $-0.66, -0.21$; $p = 0.001$) compared with the U.S. slope of $+0.03\%$ per year ($-0.05, 0.09$; $p = 0.46$), which showed no significant change.
Fichtenberg & Glantz, 2002 (United States)	Varies (review)	Smoke-free work sites are associated with a decline in adult prevalence of -3.8% .
Rohrbach et al., 2002 (California)	1996–1998	Changes in absolute percentage in adult prevalence associated with lowest, moderate, and highest exposure (to state tobacco control program) categories were $+2.53\%$, $+0.23\%$, and -0.95% , respectively ($p = 0.03$).
Weintraub & Hamilton, 2002 (Massachusetts)	1990–1999	<p>In Massachusetts, rate decreased from 23.5% (95% CI = 21, 26.1) to 19.4% (18, 20.8), which is a relative decline of 17% after demographic adjustments (AOR[†] = 0.83; 95% CI = 0.70, 0.99).</p> <p>In the United States, an absolute decline from 24.2% (23.7, 24.7) to 23.3% (22.9, 23.7) was not significant (AOR = 1.01; 0.97, 1.05).</p> <ul style="list-style-type: none"> The difference between Massachusetts and other states was significant in 1999 ($p < 0.001$), but not in 1990 ($p = 0.62$). <p>In Massachusetts men, the rate declined from 25.9% (22, 29.8) to 19.5% (17.3, 21.6), a relative decline of 27% after demographic adjustments.</p> <p>In U.S. men, the rate declined from 26.0% (25.2, 26.7) to 25.6% (24.9, 26.2), not a significant change (multivariate OR[§] = 1.03; .97, 1.08).</p> <ul style="list-style-type: none"> The difference between men in Massachusetts and other states was significant in 1999 ($p < 0.001$), but not in 1990 ($p = 0.97$). <p>In Massachusetts women, the rate declined from 21.5% (18.2, 24.8) to 19.3% (17.5, 21.1), a relative decline of 5%, which was not statistically significant ($p = 0.62$).</p> <p>In U.S. women, the rate declined from 22.5% (21.9, 23.2) to 21.2% (20.7, 21.7), not a significant change (multivariate OR = 0.99; .95, 1.04).</p> <ul style="list-style-type: none"> The difference between women in Massachusetts and other states was significant in 1999 ($p = 0.04$), but not in 1990 ($p = 0.54$).
CDC, 2001 (Arizona)	1996–1999	The rate in Arizona declined from 23.1% (95% CI = 21.9, 24.3) to 18.3% (17.1, 19.5; $p \leq 0.05$).

* Indicates a state or independent evaluation report that was not published in a peer-reviewed journal.

† AOR = adjusted odds ratio; adjusted for said variables in model.

§ OR = odds ratio.

REFERENCE (STATE)	TIME FRAME	MAJOR FINDINGS
Porter, 2000* (Arizona)	1996–1999	The rate declined from 23.8% to 18.8%, a relative decline of 21%.
Abt Associates, 2000* (Massachusetts)	1994–2000	<p>The Massachusetts rate declined from 22.9% to 19.7% ($p = 0.04$), after accounting for demographic changes, compared with no change in the other 41 BRFSS states (from 22.2% to 22.3%).</p> <p>The rate declined from 25.1% to 19.6% ($p = 0.02$) in Massachusetts men, a 1.6% annual decrease ($p = 0.09$), compared with a 0.8% annual increase ($p = 0.01$) in U.S. men ($p = 0.02$ for difference in annual rates).</p> <p>Among women, rates did not significantly decline for Massachusetts (20.8% to 19.8%; $p = 0.67$) or the other 41 states (20.6% to 20.4%).</p> <p>Among pregnant women, the rate declined from 25% to 11% in Massachusetts, while the national rate declined from 18% to 11%.</p>
Farrelly et al., 1999 (United States)	Sep 1992–May 1993	<p>Smoke-free workplaces, compared with no smoking restrictions, are associated with lower prevalence by 5.7 percentage points (95% CI = -6.5, -4.9), a relative difference of 22.8%.</p> <p>Having work area bans but allowing smoking in common areas decreases effects by half (-2.6%; 95% CI = -3.5, -1.7).</p>
Harris, 1999 (Massachusetts)	1990–1996	<p>An ANOVA[*] model of BRFSS data estimates that the adult prevalence rate declined by 2.13 percentage points in Massachusetts (95% CI = 0.81, 3.45; $p = 0.003$), by 2.05 percentage points in California (0.88, 3.22; $p = 0.002$), and by 0.8 percentage points in 40 other states plus the District of Columbia (0.20, 1.42; $p = 0.012$).</p> <p>In 1996, there were 140,000 fewer adult smokers than in 1990.</p> <p>Among pregnant women, the rate declined from 25.3% to 13.2%, a 47.8% relative decline in Massachusetts, while the U.S. rate (including Massachusetts) declined from 18.3% to 13.7%, a 26.1% relative decline.</p>
Pierce et al., 1998b (California)	Pre-1989	The rate was 23.3% (0.74% annual decrease) in California vs. 26.2% (0.77% annual decrease) in the rest of the United States.
	1989–1993	The rate declined to 18% in California (1.06% annual decrease; $p < 0.001$ for change) and 23.2% in the rest of the United States (0.57% annual decrease; $p < 0.05$ for difference between California and the rest of the United States).
	1994–1996	<p>The rate remained at 18% (0.01% annual increase) in California, which represented a significant slowing of the decline from the previous period ($p < 0.001$).</p> <p>The rate for the rest of the United States declined to 22.4%, but the 0.28% annual decrease was significantly slower than the previous decline ($p < 0.001$).</p>

*Indicates a state or independent evaluation report that was not published in a peer-reviewed journal.

^{||} BRFSS = Behavioral Risk Factor Surveillance System, a population-based telephone survey of noninstitutionalized adults conducted at the state level. For more information, see <http://www.cdc.gov/brfss>.

^{*}ANOVA is an acronym for “analysis of variance,” a statistical test of the difference between three or more independent samples.

REFERENCE (STATE)	TIME FRAME	MAJOR FINDINGS
Siegel et al., 1998 (California)	1978–1985	The estimated annual change (in absolute percentage points) was –0.60 (95% CI = –0.79, –0.40) in California vs. –0.50 (–0.67, –0.33) in the rest of the United States.
	1985–1990	The estimated annual change was –1.22 (95% CI = –1.51, –0.93) in California vs. –0.93 (–1.13, –0.73) in the rest of the United States ($p < 0.05$ for both rates increasing from previous period).
	1990–1994	The estimated annual change was –0.39 (95% CI = –0.79, –0.40) in California vs. –0.05 (–0.34, +0.24) in the rest of the United States ($p < 0.05$ for both rates slowing).
CDC, 1996 (Massachusetts)	1990–1992	The rate was 23.5% (95% CI = 22.1, 24.9) in Massachusetts, 20.1% (19.2, 21.0) in California, and 24.1% (23.8, 24.4) in the rest of the United States.
	1993–1995	The rate declined to 21.3% (95% CI = 20.1, 22.5) in Massachusetts, 17.4% (16.5, 18.3) in California, and 23.4% (23.1, 23.6) in the rest of the United States.

Table 2B. Young Adult Smoking Prevalence/Initiation □

REFERENCE (STATE)	TIME FRAME	MAJOR FINDINGS
Rigotti et al., 2002 (Massachusetts)	1999	Public college students who currently live away from their parents and attended high school in state vs. out of state were less likely to report <ul style="list-style-type: none"> All tobacco use, AOR = 0.66; 95% CI = 0.45, 0.96 ($p = 0.03$). Current smoking, AOR = 0.58; 95% CI = 0.40, 0.87 ($p < 0.01$).
Porter, 2000* (Arizona)	1996–1999	The rate decreased from 27.5% to 21% among ages 18–24, a 24% relative decline.

* Indicates a state or independent evaluation report that was not published in a peer-reviewed journal.

Table 2C. Youth Smoking Prevalence/Initiation □

REFERENCE (STATE)	TIME FRAME	MAJOR FINDINGS
Arizona Department of Health Services, 2003*	1997–2000	For high school students, the rate decreased from 31.3% to 24.6%, a 21% relative decline in Arizona. For middle school students, the rate decreased from 18.7% to 11.4%, a 29% relative decline in Arizona vs. the prevalence rate of 15.1% in the United States in 2000.
Chen et al., 2003 (California)	1990–1999	Rates of never smokers increased for males from 60% to 69% (0.87% annually) and for females from 66% to 70% (0.29% annually).
Gallup, 2003* (Maine)	1997–2001	The current (last 30 days) use among Maine high school students decreased from 39.2% to 24.8%, a 38% relative decline.
McMillen & Baldwin, 2003* (Mississippi)	1999–2002	The current (last 30 days) use in Mississippi public middle schools decreased from 23.0% to 11.9% ($p < 0.05$), a 42% relative decline. For high school students, the rate decreased from 32.5% to 23.1% ($p < 0.05$), a 24% relative decline.
Oregon Department of Human Services, 2003*	1996–2003	Relative declines were 47% for grade 8 and 26% for grade 11 in Oregon.
Washington State Department of Health, 2003*	1999–2002	Relative declines (last 30 days) were 53% (grade 6), 39% (grade 8), 40% (grade 10), and 35% (grade 12). There were an estimated 55,000 fewer youth smoking in 2002 than in 1999, and high school declines were twice the national rate of decline.
Willet et al., 2003* (Nebraska)	1997–1999 2000–2003	The current (last 30 days) use rate declined from 39.2% to 37.3%. The current (last 30 days) use rate declined from 30.5% to 24.1% ($p < 0.05$).
Rohrbach et al., 2002 (California)	1996–1998	The current (last 30 days) use rate declined from 27.4% to 21.8% ($p < 0.05$) for grade 10, although these declines were not statistically associated with exposure to tobacco control program components.
Soldz et al., 2002 (Massachusetts)	1996–1999	The current (last 30 days) use rate in Massachusetts: <ul style="list-style-type: none"> • Grade 8 declined from 26.0% to 15.6% ($p < 0.01$); grade 10, from 33.6% to 24.6% ($p < 0.05$); grade 12, from 40.7% to 34.9%.

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REFERENCE STATE)	TIME FRAME	MAJOR FINDINGS
		<p>The current (last 30 days) use rate in the United States:</p> <ul style="list-style-type: none"> Grade 8 declined from 21.0% to 17.5%; grade 10, from 30.4% to 25.7%; and grade 12 increased from 34.0% to 34.6%. All changes were not significant. <p>The lifetime use rate in Massachusetts:</p> <ul style="list-style-type: none"> Grade 8 declined from 41.0% to 30.3% ($p < 0.01$); grade 10, from 56.9% to 44.4% ($p < 0.01$); and grade 12 had a nonsignificant decline from 61.0% to 60.5%. <p>The lifetime use rate in the United States:</p> <ul style="list-style-type: none"> Grade 8 declined from 49.2% to 44.1%; grade 10, from 61.2% to 57.6%; and grade 12 increased from 63.5% to 64.6%. All changes were not significant.
Gilpin et al., 2001* (California)	1990–1999	Youth 30-day prevalence increased during 1993–1996, but the 1999 rate of 7.7% was significantly lower than the rate in 1990.
Sly et al., 2001 (Florida)	1998–1999	<p>The ever use rate among youth < 16 years declined from 33.4% (95% CI ± 2.17) to 26.7% (± 2.02), a 20.1% relative decline in Florida vs. 30.5% to 29.7% (± 2.42) in the United States, a 2.6% relative decline ($p < 0.05$ for difference from Florida).</p> <p>The current use rate among youth < 16 years declined from 9.9% (± 1.38) to 7.2% (± 1.12), a 27.3% relative decline in Florida vs. 7.0% (± 1.44) to 8.6% (± 1.21) in the United States, a 22.9% relative increase ($p < 0.05$ for difference from Florida).</p>
Abt Associates, 2000* (Massachusetts)	1995–2000	The rate declined from 36% to 30% in Massachusetts while remaining stable in the United States.
Bauer et al., 2000 (Florida)	1998–2000	<p>Current use (last 30 days) among middle school students declined from 18.5% to 11.1% (40% relative decline; $p < 0.001$), and for high school students, from 27.4% to 22.6% (18% decline; $p = 0.01$).</p> <p>Frequent use (+20 of 30 days) among middle school students declined from 5.4% to 2.9% ($p < 0.001$), and for high school students, from 13.5% to 10.4% ($p < 0.001$).</p>
Siegel & Biener, 2000 (Massachusetts)	1993/1994–1997/1998	For ages 12–13 years, exposure to television countermarketing ads (at baseline) halved progression to established smoking (AOR = 0.49; 95% CI = 0.26, 0.93); for ages 14–15 years, it had no effect (AOR = 0.94; 0.48, 1.83).
Harris, 1999* (Massachusetts)	1993–1999	For youth ages 14–17 years, the 30-day prevalence rate declined from 24.6% ($1 \pm$ Standard Error = 3.2) to 19.6% ($1 \pm$ SE = 2.9), a nonsignificant decline ($p = 0.25$) likely due to the small sample size.
Pierce et al., 1998a* (California)	1990–1993	The current use rate was 9.2% in California.
	1993–1996	The current use rate increased to 12.6% in California, a 26% relative increase from the previous period.

* Indicates a state or independent evaluation report that was not published in a peer-reviewed journal.

5

Consumption of Tobacco Products

Reducing per capita consumption (PCC) of tobacco products is a long-term goal of tobacco control programs. Consumption can be measured as overall sales of cigarettes or total sales per capita (per adult in the population). Daily consumption or average daily consumption (ADC) refers to the number of cigarettes smoked per day by an individual smoker. Comprehensive tobacco control strategies have been shown to reduce PCC by increasing cessation and by preventing initiation among youth, as well as decreasing daily consumption among continuing smokers. Thus, while reducing ADC for smokers may be an early sign of program success, it is an intermediate outcome, and cessation is the long-term goal for continuing smokers. Moreover, simply reducing the number of cigarettes smoked per day may not reduce exposure to toxins in a dose-related fashion (Hecht et al., 2004).

Table 3A. Total Consumption

REFERENCE (STATE)	TIME FRAME	MAJOR FINDINGS
Farrelly et al., 2003 (United States)	1981–2000	Sales dropped more than twice as much in states that spend more on comprehensive tobacco control programs than in the United States as a whole. During 1990–2000, sales decreased an average of 43% in Arizona, California, Massachusetts, and Oregon, compared with 20% decrease in all other states combined.
Hu et al., 1995a (California)	1989–1991	There was an 8%–9% reduction in the short run, and a 10%–13% reduction in the long run.
Glantz, 1993 (California)	1981–1988	Consumption was decreasing at rate of –45.9 million packs/year, about 2% annually.
	1989–1991	The decline more than tripled to –164.3 million packs/year ($p < 0.001$).
	June 1992	There was a significant deceleration of decline (–19.4 million packs/year; $p = 0.007$). Through June 1993, 1.1 billion fewer packs were sold since the passage of Proposition 99 in California.

Table 3B. Per Capita Consumption □

REFERENCE (STATE)	TIME FRAME	MAJOR FINDINGS
Stillman et al., 2003 (United States)	1989–1999	<p>Before intervention, ASSIST[†] states sold 10.64 packs/person/month, similar to non-ASSIST states at 10.54 ($p = 0.88$).</p> <p>During the course of the intervention, ASSIST states experienced a nonsignificant decrease ($p = 0.22$).</p> <p>Regardless of ASSIST status, states with higher cigarette price and greater increase in price over time showed a decrease in PCC of 0.57 packs/person/month (95% CI = 0.43, 0.72).</p>
Gallup, 2003* (Maine)	1997–2001	PCC decreased from 132.8 to 107 packs/year in Maine.
Oregon Department of Human Services, 2003*	1996–2003	Oregon experienced a relative decrease of 30%, steeper than other states with no comprehensive tobacco control program.
Biener et al., 2002 (Massachusetts)	1988–1992	There was a 15% decline in Massachusetts and a 14% decline in the 48 comparison states (California also excluded), representing a 3%–4% annual decline for both groups.
	1993–1999	<p>In 1993, there was a 12% decline in Massachusetts and a 4% decline in the United States.</p> <p>After 1993, when cigarette prices leveled off, Massachusetts experienced an annual decline of > 4%, while the 48 comparison states experienced an annual decline of < 1% thereafter.</p>
Gilpin et al., 2001* (California)	1990–1999	There was a relative decline of 57% in California, compared with 27% in the United States.
Fichtenberg & Glantz, 2000 (California)	1980–1988	The regression coefficient for California vs. the rest of the United States was 1.09 ($p < 0.001$); PCC was falling slightly faster in California.
	1988–1991	PCC annual rate of decline in California was significantly greater (by –2.72 packs/year/year) than in the rest of the United States.
	1992–1998	Rate of the previous decline (during 1988–1991) was reduced by 2.05 packs/year/year in California, relative to the decline in the United States ($p < 0.04$, compared with the previous period).
Abt Associates, 2000* (Massachusetts)	1994–2000	Massachusetts had a relative decline of 36% in PCC, compared with a 16% relative decline in the United States.

* Indicates a state or independent evaluation report that was not published in a peer-reviewed journal.

[†] ASSIST = American Stop Smoking Intervention Study.

REFERENCE (STATE)	TIME FRAME	MAJOR FINDINGS
California Department of Health Services, 2000*	1989–1999	PCC declined more than 50% in California to 61.3 packs/adult in 1998–1999, compared with a U.S. PCC of 106.8 packs/adult in 1999.
CDC, 1999 (Oregon)	1993–1996	PCC increased 2.2% in Oregon, while decreasing 0.6% in the United States.
	1996–1998	PCC decreased 11.3% in Oregon (from 92 to 82 packs/adult), which translates to 25 million fewer packs sold in 1998 than in 1996, despite a 2.7% increase in the state population.
Pierce et al., 1998a* (California)	Pre–1989	PCC was 9.7 packs/person/month in California (–0.40% annual decrease) and 12.4 in the United States (–0.36% annual decrease).
	1989–1993	PCC was 6.7 packs/person/month in California (–0.65% annual decrease; a 63% relative increase in the annual rate of decline from the previous period) and 10.4 in the United States (–0.45% annual decrease).
	1993–1996	PCC was 6.0 packs/person/month in California (–0.22% annual decrease, one-third the previous rate of decline) and 10.3 in the United States (–0.02% annual decrease).
Pierce et al., 1998b (California)	1983–1989	In 1988, PCC was 9.7 packs/person/month in California, 22% less than the 12.5 packs/person/month sold in the rest of the country. Rate of monthly PCC decline was –0.42 pack in California and –0.36 in the rest of the country ($p < 0.01$ for difference).
	1989–1993	In 1993, PCC declined to 6.5 packs/person/month in California, while declining to 10.4 packs/person/month in the rest of the country. Rate of monthly PCC decline increased to –0.64 pack in California ($p < 0.001$ for difference from the previous period). The rate of decline slightly (but insignificantly) increased in the rest of the country to –0.42 pack ($p < 0.001$ for difference from California).
	1994–1996	In 1996, PCC declined to 6 packs/person/month in California, 43% less than the 10.5 packs/person/month in the rest of the country. The rate of the monthly PCC decline slowed to –0.17 pack in California ($p < 0.001$ for difference from the previous period); in the rest of the country, the previous decline reversed and monthly PCC increased to +0.4 ($p < 0.001$ for difference from California and difference from previous period).

* Indicates a state or independent evaluation report that was not published in a peer-reviewed journal.

REFERENCE (STATE)	TIME FRAME	MAJOR FINDINGS
Manley et al., 1997 (United States)	1989–1991	PCC was 12 packs/person/month in ASSIST states (as a group) and non-ASSIST states (as a group; excluding California) in 1989 and 11 in 1991.
	1993–1996	In 1993, ASSIST states (as a group) maintained low PCC, while PCC began to increase in non-ASSIST states (as a group, excluding California); in 1994, this increase was statistically significant ($p < 0.05$). At the beginning of 1996, PCC in ASSIST states (as a group) was 7% less than the comparison group. 76% of ASSIST states vs. 55% of comparison states had declines in PCC, despite a real cigarette price decrease.
CDC, 1996 (Massachusetts)	1990–1992	Relative declines in PCC were –6.4% in Massachusetts, –11.0% in California, and –5.8% in the rest of the United States.
	1992–1996	Relative declines in PCC were –19.7% in Massachusetts, –15.8% in California, and –6.1% in the rest of the United States.
Elder et al., 1996 (California)	1980–1988	Average quarterly PCC declines were 3.6% in California and 2.4% in the rest of the United States.
	1989–1994	Average quarterly PCC declines were 7.9% in California and 3.2% in the rest of the United States.
Hu et al., 1995b (California)	1990–1992	PCC decreased by 35 packs/person; 79% of the decline was attributable to the price increase and 21% to the media campaign.
Hu et al., 1994 (California)	1984–1991	Immediate effect on PCC seen in 1989, with a decline of 2 packs/person (–25.7% relative decline). Long-term effect on PCC seen in 1991, with a decline of 0.75 packs/person (–9.5% relative decline).
Glantz, 1993 (California)	1980	Baseline PCC (packs/person/year) was 122.8 ($p = 0.001$) in California vs. 143.5 ($p = 0.001$) in the United States.
	1981–1988	PCC decreased by –4 packs/person/year ($p = 0.001$) in California vs. –3.8 ($p = 0.001$) in the United States, both significant declines.
	1989–1991	PCC decrease doubled to –8 packs/person/year ($p = 0.001$) in California vs. –4.7 ($p = 0.39$) in the United States.
	1992	PCC decrease slowed to –1.42 packs/person/year in California ($p = 0.032$), not significantly different from the U.S. decrease.

* Indicates a state or independent evaluation report that was not published in a peer-reviewed journal.

Table 3C. Average Daily Consumption □

REFERENCE (STATE)	TIME FRAME	MAJOR FINDINGS
Fichtenberg & Glantz, 2002 (United States)	Varies (review)	Smoke-free work sites are associated with 3.1 (95% CI = 2.4, 3.8) fewer cigarettes per day among continuing smokers.
Gilpin et al., 2001* (California)	1990–1999	Of the continuing smokers who did not quit, >60% of them smoked <15 cigarettes/day and >20% of them were nondaily smokers.
Norman et al., 2000 (California)	1998	With average daily consumption in smokers as the outcome, the home smoking ban beta coefficient (β) = -0.301 ($p < 0.01$).
Farrelly et al., 1999 (United States)	September 1992–May 1993	For those with smoke-free work sites, continuing smokers reported consuming 2.67 (95% CI = 2.28, 3.05) fewer cigarettes/day compared with smokers with no smoking restrictions; population subgroups varied in these effects.
Pierce et al., 1998a* (California)	1989	Smokers smoked 17.3 cigarettes/day in California vs. 19.5 in the rest of the United States.
	1992–1993	Smokers smoked 15.3 cigarettes/day in California vs. 18.1 in the rest of the United States.
	1995–1996	Smokers smoked 13.7 cigarettes/day in California (a 10.4% decrease from previous period) vs. 17.3 in the rest of the United States (a 4.4% decrease from the previous period).

* Indicates a state or independent evaluation report that was not published in a peer-reviewed journal.

6

Cessation of Tobacco Use

Cessation of tobacco use by youth and adults is a long-term outcome of tobacco control program initiatives, which include efforts to promote and support cessation. Various cessation indicators are used by evaluation studies. Examples of indicators include the quit ratio (proportion of ever smokers who have quit smoking), awareness of cessation services, desire to quit, proportion of users making quit attempts, and quit success rates (i.e., recent quitters/previous-year smokers).

Table 4A. Quit Ratio

REFERENCE (STATE)	TIME FRAME	MAJOR FINDINGS
Jemal et al., 2003 (United States)	1990–1999	An index of the strength of state tobacco control programs was highly correlated with state quit ratios ($r = -0.82, p < 0.0001$).
Siegel et al., 1998 (California)	1978–1985	Estimated annual change was 0.73 (95% CI = 0.22, 1.24) in California and 0.73 (0.40, 1.05) in the rest of the United States.
	1985–1990	Estimated annual change was 1.36 (95% CI = 0.74, 1.97) in California and 1.04 (0.62, 1.46) in the rest of the United States.
	1990–1994	Estimated annual change was 0.18 (95% CI = -0.80, 1.15) in California and 0.15 (-0.47, 0.77) in the rest of the United States.

Table 4B. Other Cessation Measures □

REFERENCE (STATE)	TIME FRAME	MAJOR FINDINGS
Meshack et al., 2003* (Texas)	2000–2002	The regions with most intensive pilot activities experienced higher rates of awareness (23.1% vs. 13.8%), use of telephone counseling services (2.7% vs. 1.2%), and cessation (11% vs. 9%). Additionally, receipt of telephone counseling services led to significantly higher 1-year cessation rates (20.7% vs. 13.2%, or 10.3% vs. 6.6% if assumed those lost to follow-up failed).
Washington State Department of Health, 2003*	1999–2002	Smokers making serious quit attempts increased from 15% to 26%.
Gilpin et al., 2001* (California)	1990–1999	Smokers making quit attempts increased from 49% to 60%.
Abt Associates, 2000* (Massachusetts)	1993–1999	Quit success rate increased from 17% to 25%.
Norman et al., 2000 (California)	1998	Smokers with a home smoking ban were twice as likely to report wanting to quit smoking than smokers with no rules in the home after controlling for multiple predictors (OR = 2.16; 95% CI = 1.26, 3.7; $p < 0.01$).
Popham et al., 1998 (California)	1990–1991	According to qualitative self-report, the California media campaign influenced at least 173,000 former smokers to quit and was a major influence for 33,000 of those.

* Indicates a state or independent evaluation report that was not published in a peer-reviewed journal.

7

Smoke-Free Legislation and Policy

Eliminating exposure to secondhand smoke is a long-term program goal. Enactment and enforcement of smoke-free policies are short-term goals in this goal area, and compliance with such policies is an intermediate goal. Compliance with smoke-free policies reduces or eliminates exposure to secondhand smoke among nonsmokers and also encourages cessation and decreased consumption among continuing smokers.

Table 5. Enactment and Enforcement of Smoke-Free Policies

REFERENCE (STATE)	TIME FRAME	MAJOR FINDINGS
McMillen et al., 2003* (Mississippi)	2000–2002	Smoking bans in all work areas increased from 53.2% to 64.7% ($p < 0.05$) in Mississippi vs. 65.7% to 65.0% in the United States.
Oregon Department of Human Services, 2003*	1996–2003	More than 95% of work sites were covered by smoke-free law, while 71% to 81% of homes reportedly had smoke-free policies.
Bartosch & Pope, 2002 (Massachusetts)	March 1999	In a regression model of local enactment of smoke-free and youth access policies, 47% of the variance in policy enactment was explained by state funding and larger town size.
Rohrbach et al., 2002 (California)	1996–1998	Changes in absolute percentage in home smoking bans associated with lowest, moderate, and highest exposure categories were +2.01%, +2.89%, and +4.15%, respectively ($p = 0.04$). Changes in absolute percentage in perceived violations of work no-smoking policies associated with lowest, moderate, and highest exposure categories were +0.66%, -0.31%, and -3.2%, respectively ($p = 0.03$).
Siegel, 2002 (United States)	Varies (review)	State tobacco control programs focused on controlling secondhand smoke usually enact policies at state and local levels (precluding the existence of state preemption laws).
Gilpin et al., 2001* (California)	1990–1999	Indoor workers with smoke-free policies increased from 35% to 93%. Those with indoor home smoke-free policies were 73% in 1999, a 30% relative increase from 1993. Also, 88.6% of children and 47.0% of smokers resided in smoke-free homes in 1999.

* Indicates a state or independent evaluation report that was not published in a peer-reviewed journal.

REFERENCE (STATE)	TIME FRAME	MAJOR FINDINGS
Norman et al., 2000 (California)	March–July 1998	Smokers with a home smoking ban were more than 2 times as likely to have heard of community programs (AOR = 2.27; 95% CI = 1.23, 4.21) and almost 3 times as likely to have seen and discussed a television ad about smoking around children (AOR = 2.87; 95% CI = 1.11, 7.41) after adjusting for age, race/ethnicity, gender, and education. In multivariate models, having a home smoking ban was associated with average daily consumption ($\beta = -0.3.1$; $p < 0.01$) and expressing a desire to quit smoking (OR = 2.16; 95% CI = 1.26, 3.7).
Porter, 2000* (Arizona)	1996–1999	Indoor home smoking bans increased from 32.2% to 41.1% for smokers and from 30.0% to 43.9% for nonsmokers. Total home smoking bans (including outdoors) decreased from 15.7% to 6.9% for smokers and from 50.6% to 39.4% for nonsmokers.

* Indicates a state or independent evaluation report that was not published in a peer-reviewed journal.

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