

Health Investments That Pay Off: Taking a Comprehensive Approach to Tobacco Control

Executive Summary

With national attention focused on transforming health care systems, governors and other state leaders are seeking interventions that improve population health and health care quality and reduce health care costs. Tobacco use is the leading cause of premature disease and death in the United States, costing more than \$170 billion each year in direct medical expenditures. More than 60 percent of spending associated with tobacco use is incurred by state and federal government purchasers of health care. States have an opportunity to improve health outcomes and reduce costs by focusing on population-wide interventions and enhancing their tobacco control programs. All states currently have tobacco control laws and programs, but most state programs could do more to implement interventions that have the proven potential to generate savings greater than their implementation costs. Comprehensive tobacco control interventions include multipronged approaches to prevent initiation, promote cessation, eliminate health disparities caused by tobacco use and end exposure to secondhand smoke.

The following evidence-based strategies are part of comprehensive tobacco control interventions:

- Assess gaps in current tobacco control efforts and laws, including smokefree air laws, to identify priority areas for new policies and programs, helping ensure that resources are being directed to the initiatives that have the most significant outcomes;
- Raise the price of tobacco products (for example, by increasing state taxes on tobacco products), which has consistently been shown to reduce tobacco consumption and prevent tobacco initiation among youth and young adults, thus avoiding future tobacco-related health care costs for states;
- Identify and prioritize interventions that target high-risk populations (for example, children and pregnant women) whose health could be most adversely affected by tobacco and whose avoidance of tobacco and secondhand smoke exposure could generate substantial cost savings for states;
- Promote cessation treatments, and increase awareness of their availability, to ensure that tobacco users know of state resources to help them quit;
- Expand public and private insurance coverage of proven cessation treatments, including removing barriers to accessing treatment, because even low barriers (such as nominal copays) have been shown to discourage enrollees from using cessation services;
- Use existing public education materials that have proved their efficacy, such as materials created by the Centers for Disease Control and Prevention and national public health organizations, to avoid the costs of designing new tobacco control messaging campaigns; and
- To demonstrate success, incorporate evaluation to measure outcomes and fiscal impacts, and

create an evidence base to support continued tobacco prevention and control work.

California and **Arizona** implemented comprehensive tobacco control programs to discourage tobacco use and provide cessation options. Both states yielded net savings within five years of implementation. Other states have experienced positive fiscal results from more limited strategies, including a cessation intervention in **Massachusetts**. Although states may experience benefits when implementing individual components of a comprehensive intervention, stronger evidence exists for significant return on investment from comprehensive programs.

Introduction

Tobacco use imposes a considerable burden on society, including disease, death, health care costs and economic costs resulting from lost productivity. Smoking is the leading cause of premature death and preventable disease in the United States, with cigarette smoking and exposure to secondhand smoke responsible for at least 480,000 premature deaths each year.¹ Smoking costs the country at least \$170 billion a year in direct medical costs, more than \$150 billion a year in lost productivity resulting from premature smoking-related deaths and another \$5.6 billion in lost productivity resulting from exposure to secondhand smoke.² More than 15 percent of all Medicaid spending is attributable to cigarette smoking (see “Smoking Fast Facts” below).³

The most effective way for states to reduce the use of tobacco is through comprehensive prevention and control interventions paired with legal and administrative policy changes designed to prevent initiation of tobacco use and promote cessation (see “Components of Comprehensive Tobacco Control Programs” on page 3).⁴ Such interventions also aim to eliminate exposure to secondhand smoke, eliminate tobacco-related health disparities and ultimately reduce the burden of tobacco-related diseases and premature deaths on society.⁵

States have been implementing measures to reduce tobacco use and secondhand smoke exposure for more than 50 years, and most states are now in a position to move towards comprehensive tobacco control programs by adding to and bolstering their current efforts. The following discussion relies primarily on researchers’ calculations of return on investment (ROI) attributable to the implementation of comprehensive state tobacco control programs.⁶ Adding components to existing efforts to create a comprehensive program may result in different levels of ROI.⁷ With few exceptions, researchers have not examined the specific ROI to Medicaid programs from tobacco control programs; rather, they have focused on ROI for all health insurance payers within a state.¹¹ Because the percentage of Medicaid-only enrollees who smoke cigarettes (29.1 percent) is more than double that of individuals with private insurance (12.9 percent), state Medicaid programs are likely to experience a

Smoking Fast Facts

- Smoking costs the United States approximately \$170 billion in direct medical costs and more than \$150 billion in lost productivity each year.⁸
- About 15.2 percent of Medicaid spending— approximately \$40.1 billion—is estimated to be attributable to cigarette smoking.⁹
- More than 60 percent of tobacco-related health care costs are paid by government purchasers of health care at either the federal or state level.¹⁰

Components of Comprehensive Tobacco Control Programs

- State and community interventions, such as state and local smoke-free policies, aimed at shifting social norms away from tobacco use and protecting the public from the harms of secondhand smoke exposure.
- “Mass-reach” health communication interventions can use a variety of media platforms to convey the health risks of tobacco use and the availability of cessation assistance for those who need it.
- Cessation interventions, which promote clinical tobacco screening and counseling, expand coverage of and access to cessation treatments and enhance state quitline capacity.
- Capacity-building and other efforts build a sustainable program:
 - Surveillance and evaluation, which monitor tobacco use rates and trends and provide information about the efficacy and fiscal impact of interventions; and
 - Infrastructure, administration and management capacity, including partnerships with state and community health organizations and sufficient funding guided by evidence-based funding recommendations from the Centers for Disease Control and Prevention (CDC).

significant share of the ROI from comprehensive tobacco prevention and control interventions.¹²

Strategies to Implement and Finance Evidence-Based Comprehensive Tobacco Control Interventions

States can take several approaches to implementing and financing population-level tobacco prevention and control. They can assess and address gaps in tobacco prevention and control efforts, increase the price of tobacco products, target high-risk populations, raise Medicaid and private insurance enrollees’ awareness of coverage of cessation treatments and lower barriers to those treatments, use evidence-based public communication campaigns and incorporate strong evaluation components into their tobacco control programs. States should also consider the ratio of costs to benefits and savings when adding new laws or interventions.

Assess and Address Gaps in Tobacco Control Efforts

All states currently have some policies or programs intended to prevent and reduce tobacco use, although

they may fall short of being comprehensive. States should evaluate current programs to determine their effectiveness and compare those programs to a comprehensive model to determine whether they could achieve enhanced results, including lower health care spending, by augmenting current programs and policies with new initiatives or laws. For example, if a state does not yet prohibit smoking in all areas of public-sector worksites, governors can issue an executive order to make all executive branch facilities and properties smoke free. Comprehensive smoke-free air laws and regulations have been associated with decreases in hospitalizations for heart attacks, among other population health benefits, and a robust body of evidence shows positive financial and health outcomes.¹³ States can also consider increasing funding for tobacco control if they determine that a substantial gap exists between their current funding levels and Centers for Disease Control and Prevention’s (CDC) evidence-based recommendations for their state.¹⁴

Increase Prices of Cigarettes and Other Tobacco Products

Currently, all states place a tax on cigarettes ranging

from \$0.17 per pack to \$4.35 per pack.¹⁵ Most states tax other tobacco products as well, and some apply their general sales tax to tobacco products in addition to the tobacco-specific tax. Those policies all serve to raise the price of tobacco, which has been shown to lower the frequency and intensity of tobacco use and—most importantly—deter initiation of tobacco use, particularly for youth.¹⁶ Increasing the price of tobacco products can also raise state revenues, which states can use to support new tobacco control efforts.¹⁷ Studies have found that a 10 percent increase in the price of a pack of cigarettes can lead to a 3 to 5 percent decrease in cigarette consumption among adults, with larger decreases among youth.¹⁸ States can also use increases in tobacco excise taxes to fund comprehensive tobacco control programs, which can help maximize the public health benefits of this policy approach.¹⁹

States can raise tobacco prices through excise taxes on cigarettes and other tobacco products and by increasing tobacco retailer licensing fees. States can also employ new technologies, such as high-tech tax stamps, to better enforce existing revenue policies and raise collections.²⁰ In addition, states can pass minimum-price laws, which ensure that discounts and tobacco company promotions do not make tobacco more accessible, especially to youth.²¹

Target High-Risk Populations

Although these programs need to reach all populations, identifying and addressing the highest-risk populations are critical tasks for both improving overall population health and generating savings. Populations at higher risks of costly tobacco-related conditions and illnesses include pregnant women, individuals with multiple comorbidities such as cardiac disorders or obesity, and individuals with mental illnesses. In addition, cessation interventions for pregnant women have the potential to generate rapid health benefits and cost savings.²² Although modest expenses are associated with improved tobacco cessation coverage in state Medicaid programs, there can be large financial returns

as a result of improved health outcomes and reduced health care costs.²³

States' Medicaid programs can work with private health plans to coordinate analysis of claims data to better identify populations that have high rates of tobacco use and to make evidence-based cessation treatments available to them. Youth are also a high-priority population for states' prevention efforts, such as community interventions and "mass-reach" public-education campaigns, which states' public health agencies can lead.

One way to effectively reach high-priority adult populations is through telephone quitlines, which offer cessation support in a more immediate and convenient manner than in-person programs.²⁴ States can make cessation resources available to high-risk populations by funding media campaigns that promote state quitlines, then funding these quitlines at adequate levels to ensure that they have sufficient capacity to handle the resulting call volumes. State quitline staff can work with their state Medicaid programs to secure a 50 percent federal administrative match for quitline counseling provided to Medicaid enrollees (as long as the claims do not duplicate costs that would or should be funded through other means).²⁵ A systems approach such as building tobacco screening and intervention, including electronic referral to quitlines into electronic health records programs, can help to increase quitlines' reach and utility.²⁶ To maximize their effectiveness, state quitline initiatives (such as enhancing services or publicizing quitline services) should be coordinated with other tobacco control efforts at multiple levels.

Raise Enrollees' Awareness of Coverage of Cessation Treatments

The Patient Protection and Affordable Care Act (ACA) improves cessation coverage (see "ACA Requirements for Coverage of Tobacco Cessation Services and Products" on page 5) for non-grandfathered private plans and Medicaid, but such coverage by itself is not enough. Even the most generous cessation benefit will

have no effect if smokers and health care providers are not aware of the benefit and do not use it. In 2010, only about 32 percent of cigarette smokers who tried to quit had used cessation medications or counseling.²⁷ Medicaid enrollees' and providers' levels of awareness of Medicaid coverage of cessation treatments are typically low, but they can be increased through promotion activities.²⁸

States can use communication campaigns to raise awareness about the health consequences of tobacco use and publicize Medicaid and private cessation resources to aid quit attempts, including highlighting

these resources' availability with minimal barriers, such as copays. For example, in **Wisconsin**, Medicaid officials reached out to persons enrolled in Medicaid managed care organizations (MCOs) and their providers with an education campaign that raised awareness about Medicaid coverage of tobacco cessation treatments. After the campaign ended, MCO enrollees' use of cessation treatments increased significantly (from 1.5 percent with pharmacotherapy claims at the beginning of the campaign to 4.4 percent during the follow-up evaluation period) compared to fee-for-service Medicaid enrollees, who did not receive the educational materials.²⁹

ACA Requirements for Coverage of Tobacco Cessation Services and Products

Non-grandfathered private plans:

- Must cover preventive services with an A or B rating from the U.S. Preventive Services Task Force (USPSTF), including tobacco cessation, with no cost-sharing.
- The U.S. Departments of Health and Human Services, Labor and Treasury issued guidance in May 2014 that clarified that coverage should include the following components, without cost-sharing:
 - Screening for tobacco use;
 - At least two quit attempts per year, with each quit attempt consisting of:
 - Four cessation counseling sessions of at least 10 minutes each, including telephone, group and individual counseling, without prior authorization; and
 - All U.S. Food and Drug Administration (FDA)–approved cessation medications, including both prescription and over-the-counter medications, for a 90-day treatment regimen when prescribed by a health care provider, without prior authorization (Section 1001; see FAQ guidance).

Traditional Medicaid:

- State Medicaid programs are barred from excluding FDA-approved cessation medications from coverage (Section 2502).
- State Medicaid programs are required to provide a comprehensive cessation benefit for pregnant women, without cost-sharing (Section 4107).

Expansion Medicaid (in states that opt to expand Medicaid):

- Expansion plans must cover USPSTF A– and B–rated preventive services, which include tobacco cessation, with no cost-sharing (Sections 1937, 2001).

As states promote specific smoking cessation aids, they should consider messages around the issue of electronic nicotine delivery systems, such as electronic cigarettes (e-cigarettes). The U.S. Food and Drug Administration's (FDA) has not approved these products as a safe or effective cessation treatment. E-cigarettes are rapidly growing in popularity based in part on a public perception that they can help smokers quit conventional cigarettes, but there is currently no conclusive scientific evidence that these products are effective for long-term cessation from conventional cigarettes.³⁰ These products also contain a wide range of nicotine concentrations; nicotine is addictive, has been shown to have negative health consequences for pregnant women, and might harm the developing adolescent brain (For more information, please see the appendix on page 9).³¹

Increase Use of Cessation Treatments Through Public and Private Coverage

Private insurers and Medicaid MCOs are critical partners in states' efforts to reduce tobacco use. The ACA requires non-grandfathered private insurers to cover cessation treatments without cost-sharing. The U.S. Departments of Health and Human Services, Labor and Treasury issued subregulatory guidance in May 2014 that clarified that requirement (see "ACA Requirements for Coverage of Tobacco Cessation Services and Products" on page 5).³² The guidance states that cessation coverage should not include cost-sharing or prior authorization requirements, although plans are still allowed to impose other barriers to accessing cessation treatments, such as annual and durational limits, which can reduce their use. The extent of cessation coverage that private plans provide varies from state to state, insurer to insurer and plan to plan, often falling short of being a comprehensive, evidence-based, barrier-free cessation benefit.³³ States can improve coverage of cessation treatments by helping private insurers understand the value of covering these treatments and leading through example by removing barriers to cessation treatments in state-sponsored coverage. Some states may also be able to

remove restrictive policies in private coverage through regulation for fully insured plans (in most cases, states cannot directly regulate self-insured health plans). State insurance commissioners can play an important role in this effort by ensuring that health insurers are aware of and comply with the aforementioned federal tobacco cessation coverage guidance.

The ACA does not extend its prohibition of cost-sharing for cessation treatments to traditional—that is, non-expansion—Medicaid enrollees, and a substantial number of state Medicaid programs still charge copayments for at least some cessation treatments.³⁴ Even nominal cost-sharing may deter Medicaid enrollees from accessing such services.³⁵ Accordingly, state Medicaid programs can increase the use of proven cessation treatments among enrollees by removing cost-sharing for cessation counseling and medications. State Medicaid programs can increase the use of cessation treatments by removing other barriers to access, such as prior authorization and duration limits, which a significant number of states continue to impose.³⁶ In addition, a small number of state Medicaid programs impose lifetime limits on smoking cessation programs. Governors can direct their state Medicaid programs to change these policies to make treatments more accessible, with the potential for quick results, as in the case of **Massachusetts'** efforts.

Use Proven Public Education Campaign Materials

Public education campaigns raise public and private coverage enrollees' awareness and use of comprehensive cessation treatments. To save time and resources, states can adopt advertising and messaging materials that have been used and tested in other states and nationwide. States should select materials that are evidence-based and cost-effective, such as those available from CDC's Media Campaign Resource Center.³⁷ Evidence from public education campaigns (such as CDC's *Tips From Former Smokers* campaign) indicates that the addition of high-impact public

education campaigns to state tobacco control efforts may generate ROI.³⁸ Governors and other senior public figures can also secure media attention and direct public attention to issues related to tobacco control.

Design and Integrate an Evaluation Program for Decision Making and Public Support

A comprehensive evaluation strategy that includes data collection is critical for any health intervention strategy built on the promise of ROI. Without evidence of an intervention's costs and benefits, it is difficult to know whether the intervention worked as expected and whether it should be expanded or curtailed. States can also use an effective evaluation program for program management and continuous improvement. Furthermore, successful evaluations are central to gaining support from providers, payers, patient advocates and other stakeholders over the long term. Direct metrics for the outcomes of tobacco control programs include hospitalization rates, measures of cardiovascular and lung diseases, and related costs of both. Related process measures that may be of use include provider screening and cessation treatment prescription rates and the fill rates for these prescriptions. Measurements can include indirect economic impacts such as productivity gains from averted missed days of school and work. Both direct and indirect measurements can be used to show a comprehensive program's efficacy when delivering updates and reports to stakeholders, such as the state legislature. Those measures can form the basis for longer-term projections, which can in turn be used to sustain support.

State Examples of Tobacco Control Interventions With ROI: California and Arizona

California's comprehensive tobacco control intervention employed a broad focus aimed at both preventing youth initiation of tobacco use and promoting cessation among adults. The state strategy relied on a tobacco tax increase of \$0.25 per pack of

cigarettes in 1988 (equivalent to about \$0.50 in 2015), with the goal of reducing smoking rates among youth and young adults. Studies have shown that price increases are especially effective at deterring smoking initiation among youth and can directly decrease the number of regular smokers in a state because nearly nine out of ten adult smokers first try cigarettes before age 18. By raising the price of cigarettes through the \$0.25-per-pack tax increase, California targeted youth smoking rates and helped fund other tobacco control work, which made passage of those legislative proposals more politically acceptable.³⁹ California supported community interventions and a broad range of public communication campaigns to counter tobacco industry messaging and discourage youth initiation of tobacco use through education about the marketing of tobacco products and the health consequences of smoking. In addition, the state heavily promoted its cessation services and telephonic quitlines through multiple media channels.⁴⁰ Strong existing smoke-free laws prohibiting smoking in indoor areas of worksites and public places also contributed to the state's positive results.⁴¹

Studies have estimated that California's tobacco control program resulted in a \$134 billion reduction in statewide medical spending from 1989 to 2008.⁴² California's program helped lower the adult cigarette smoking rate from about 22 percent in 1988 to nearly 12 percent in 2010.⁴³ Taking the state's \$2.4 billion spending for tobacco control during that period as its investment, one study estimated that cumulative ROI for all payers was greater than 5,000 percent.⁴⁴ In 1991, the program broke even and generated net savings to the state from that point onward.⁴⁵ Studies have linked California's broad focus on youth and adults with its program's substantial ROI.

Arizona's comprehensive tobacco control intervention focused on youth and preventing initiation of tobacco use. Arizona mainly used programmatic interventions such as community outreach in schools and media campaigns aimed at discouraging youth initiation of

tobacco use.⁴⁶ The state also increased the price of tobacco and used the revenues to fund the programmatic elements of its comprehensive intervention. Between 1996 and 2004, the evaluation period of the intervention, the state spent an estimated \$235 million on school outreach and generated about \$2 billion in health care savings. Both private and public purchasers of health care shared these savings, which represent a total ROI of approximately 1,000 percent.⁴⁷ During the eight-year evaluation period, Arizona reported an absolute decrease of 200 million fewer cigarettes smoked compared to states that had no such tobacco control programs.⁴⁸

Additional Tobacco Control Options with ROI Potential: Massachusetts

The most robust evidence for significant ROI from tobacco control programs is for comprehensive interventions such as those undertaken in California and Arizona, but studies have also found the potential for ROI in states from more limited interventions focused on cessation of tobacco use among adults.

Beginning in 2006, Massachusetts enhanced its Medicaid, coverage of cessation treatments and conducted extensive and multi-faceted promotion

efforts to raise Medicaid enrollees’ and health care providers’ awareness and use of the new cessation options. The program incorporated evaluation components and provides a state-level example of a Medicaid-specific cessation intervention designed to reduce smoking rates, smoking-related disease, and related health care costs among Medicaid enrollees. The program’s benefit package offered a broad array of treatments. In addition, it reduced barriers to accessing treatments and included aggressive promotion to both Medicaid enrollees and their physicians.⁴⁹ During the first 36 months of the program, 37 percent of all adult Medicaid smokers used the treatments, and the program was associated with the smoking prevalence among Medicaid enrollees in the state decreasing from 38.3 percent to 28.3 percent.⁵⁰ The program directly contributed to a reduction in hospital admissions for heart attacks, which fell by an estimated 46 percent, and of other acute coronary diagnoses, which decreased by an estimated 49 percent.⁵¹ Studies estimated that the state saved \$3.12 on cardiovascular hospital admissions for every dollar it spent on the program.⁵² Because the analysis considered only inpatient hospital expenditures for cardiovascular conditions, the actual overall ROI of the program would likely have been higher.

*Frederick Isasi
Division Director
Health Division*

*NGA Center for Best Practices
202-624-7872*

*Kelly Murphy
Program Director
Health Division*

*NGA Center for Best Practices
202-624-5399*

*Doug Kershner
Policy Analyst
Health Division*

*NGA Center for Best Practices
202-624-7834*

August 2016

The National Governors Association Center for Best Practices wishes to acknowledge and thank the Centers for Disease Control and Prevention (CDC) for a cooperative agreement (1U38OT000227) that supported the development of this paper.

Recommended citation format: F.Isasi, K.Murphy and D.Kershner. Health Investments That Pay Off: Taking a Comprehensive Approach to Tobacco Control (Washington, D.C.: National Governors Association Center for Best Practices, August 16, 2016).

Appendix. Electronic Nicotine Delivery Systems and the Changing Landscape of Tobacco Products

What Are Electronic Nicotine Delivery Systems?

Electronic nicotine delivery systems (ENDS), including electronic cigarettes (e-cigarettes), are battery-powered devices that typically provide inhaled doses of nicotine and other ingredients to the user in an aerosol mist. Most ENDS contain tobacco-derived nicotine. Their most common components include a liquid base (most often propylene glycol), to which flavoring compounds and liquid nicotine are frequently added, a battery, a heating element, and an aerosol spray nozzle.⁵³ At the federal level, the U.S. Food and Drug Administration's (FDA) Center for Drug Evaluation and Research presently regulates ENDS marketed for therapeutic purposes, but as of February 2016, no manufacturers have had their products approved as therapeutic devices to aid cessation.⁵⁴ In April 2014, FDA issued a proposed rule that would extend the agency's tobacco authority to cover additional products that meet the legal definition of a *tobacco product*, including ENDS. The final rule deeming that ENDS are tobacco products subject to FDA authority was issued on May 5, 2016, meaning that restrictions on what products can be marketed on the basis of this authority may be several years away. The final regulation deeming ENDS as tobacco products did, however, prohibit their sale to minors.

Are There Health Consequences of ENDS Use?

Insufficient evidence exists to support claims that ENDS do not constitute a health risk, especially as a result of long-term use. According to the U.S. Surgeon General, ENDS may have both potential harms and benefits for individual- and population-level health.⁵⁵ Although studies have found that ENDS emissions contain much lower concentrations of some of the harmful chemicals found in cigarette smoke, many of these chemicals and particulates are still present at elevated levels in ENDS aerosol, including secondhand emissions.⁵⁶ Those chemicals and substances can include nicotine, heavy metals, volatile organic compounds, ultrafine particulates, and carcinogens such as tobacco-specific nitrosamines.⁵⁷ ENDS aerosol is not harmless "water vapor," and it is not as safe as clean air.

Do ENDS Pose Other Public Health Risks?

In addition to concerns about the contents of ENDS emissions, the number of adolescents under age 18 using e-cigarettes is rising rapidly every year. Nicotine may harm adolescent brain development, making use of ENDS that contain nicotine is itself a public health concern. Even though advertisements for conventional cigarettes have been banned from television since 1971, ENDS ads air on a variety of television programs, which can expose children to glamorized depictions of the use of these products.⁵⁸ In 2014, almost 70 percent of students in middle and high school were exposed to some form of ecigarette advertising.⁵⁹ E-cigarettes frequently use fruit and candy flavorings that are banned in cigarettes because of their appeal to youth, and e-cigarettes have been marketed using cartoons and graphics that may appeal to children.⁶⁰ Between 2011 and 2013, the proportion of children who had never smoked a cigarette but had used an ecigarette more than tripled, rising to more than 263,000 children in 2013.⁶¹ The number of high school students currently using e-cigarettes (defined as use within the past 30 days) has continued to grow. In 2014, 13.4 percent of all high school students had used an ecigarette in the past 30 days.⁶²

Are ENDS an Effective Cessation Aid?

Despite some marketing claims that e-cigarettes can help smokers quit smoking traditional tobacco products, there is currently no conclusive scientific evidence that ENDS are effective for long-term cessation from conventional cigarettes. Additionally, ENDS are not currently approved by the FDA as a smoking cessation devices. Most

adult ENDS users also smoke conventional cigarettes in addition to ENDS, which is referred to as “dual use”; according to 2012-2013 data, more than 75 percent of adults who had used e-cigarettes in the past 30 days were also current cigarette smokers.⁶³ Dual use is a public health concern because the health benefits of reduced use of conventional cigarettes are relatively small compared to quitting completely. Because of the high prevalence of dual use compared to cessation of conventional cigarettes among adult ENDS users, there may be a negative public health impact of ENDS use relative to use of FDA-approved cessation aides, which evidence has shown can help smokers quit.

Have States Regulated E-Cigarettes?

Several states have taken action on ENDS by prohibiting sales to minors, including ENDS in smoke-free laws, and taxing ENDS. Most states have passed laws prohibiting the sale of ENDS to minors, though these have been superseded by the federal regulations issued in May 2016; as of March 2016, as many as 21 states had included e-cigarettes in smokefree air laws and regulations, though many of these policies fall short of prohibiting ENDS use in all enclosed public spaces.⁶⁴ As of March 2016, three states (**Louisiana, Minnesota and North Carolina**) and the District of Columbia had imposed taxes on ENDS, with others considering taxes.⁶⁵ Governors should be aware that state legislatures might pass bills that have language excluding ENDS from existing state tobacco policies, which may deprive states of some regulatory authority or revenues in the future.

Endnotes

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- ⁴ Brian King et al., “Executive Summary,” *Best Practices for Comprehensive Tobacco Control Programs—2014* (Atlanta: Centers for Disease Control and Prevention, 2014), 6–8, http://www.cdc.gov/tobacco/stateandcommunity/best_practices/pdfs/2014/comprehensive.pdf (accessed April 16, 2016).
- ⁵ *Ibid.*
- ⁶ ROI is often presented differently in scholarly literature. For the purposes of uniformity and comparison with other potential interventions, this paper calculates ROI as $(\text{intervention benefit} - \text{intervention cost}) / \text{intervention cost}$. In some instances, ROI has been recalculated using this formula and may differ from the ROI presented in the original source. A positive ROI reflects cost savings after accounting for all intervention costs within a given period. A negative ROI indicates that the benefits from the intervention were not enough to offset the cost of the intervention within the time-frame of study.
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