

home with a blood-pressure cuff and texted daily, the majority sent readings during the critical first postpartum week.

Similarly, an orthopedics practice manager, believing access to care could be improved, advertised same-day scheduling on the practice's website, providing his personal cell-phone number so that he became a one-person fake call center. In 3 days, he validated that such a system was both operationally and financially viable and also learned that when people seek same-day scheduling (which is hard to provide), they find scheduling within a few days acceptable (which is easier).

These two projects also illustrate a technique called mini-pilots: experiments integrated with operations, which may not support the small P values necessary for scholarly publication but which also don't take months or



An audio interview with Dr. Asch is available at [NEJM.org](http://www.nejm.org)

years to conduct. A typical clinical trial fixes the intervention at the start, follows it through its course, and isn't translated into new knowledge until the unblinding at the end.⁴ In contrast, successful new innovators ask, "What must be true for this idea to succeed?" and rapidly test critical assumptions in context.

Only days were required to learn that patients would text

back their blood-pressure readings or would seek same-day scheduling and could be accommodated. That information didn't prove the programs would work, but it permitted early decisions about whether to keep moving forward, abandon the idea, or pivot the approach because of new insights or identified barriers. In less than 2 months, we ran half a dozen postpartum-hypertension mini-pilots sequentially, each addressing a question the previous pilot had raised.

Aiming to get sedentary people walking, we launched a walking contest using smartphone pedometers and a fake back end for data collection. A mini-pilot revealed that our design inadvertently motivated active people to walk even more — but demotivated the target population, who felt defeated when they lagged on leaderboards. But observation of potent social dynamics permitted identification of new kinds of social comparisons that could get people moving. A few days of testing yielded compelling insights that justified investing in larger, more definitive trials.

With these techniques, we can test ideas faster and at lower cost to determine which ones work. Some organizations have already improved health care by using these methods to identify the

intersection of human needs, business viability, and technical feasibility.⁵ Collectively, rapid validation techniques make us optimistic about the enduring contribution of health care innovation. They support a culture of experimentation, in which front-line clinicians and employees can turn insights into initial data, with snippets of time and small budgets. Other industries have advanced these techniques, but health care can adapt them to do much more than just build the next app.

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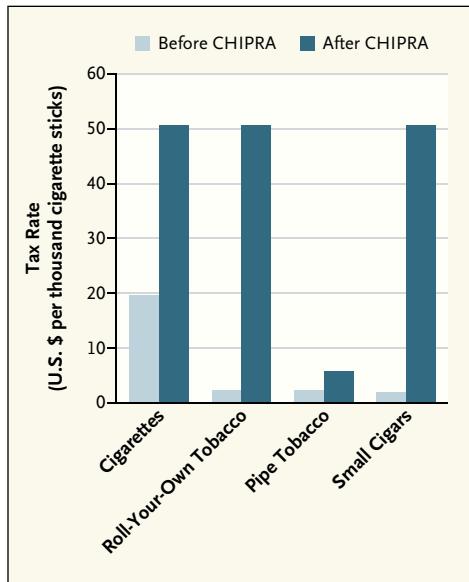
Differential Taxes for Differential Risks — Toward Reduced Harm from Nicotine-Yielding Products

Frank J. Chaloupka, Ph.D., David Swenor, J.D., and Kenneth E. Warner, Ph.D.

In a January 2014 report that marked the 50th anniversary of the first Surgeon General's Report on Smoking and Health,

acting U.S. Surgeon General Boris Lushniak concluded that the enormous toll of tobacco-induced disease and death is

overwhelmingly the result of combustible tobacco use, specifically cigarette smoking. He called for a rapid reduction in



Changes in Federal Excise Tax Rates for Tobacco Products as a Result of the Children's Health Insurance Program Reauthorization Act (CHIPRA) of 2009.

Data are from the Government Accountability Office. The roll-your-own tobacco and pipe tobacco cigarette-stick equivalent is based on a weight of 0.0325 ounces of tobacco per cigarette stick (i.e., per cigarette), in accordance with the Master Settlement Agreement conversion rate.

the use of combustible products to reduce the related burden of illness.¹ We believe this goal could be achieved by imposing differential taxes on nicotine products — including sharply increased taxes on combustible products.

Today's nicotine consumer has a remarkable array of options, ranging from extremely low-risk products (nicotine-replacement products approved by the Food and Drug Administration [FDA]) to extraordinarily risky ones (cigarettes, which kill half of long-term users). Elsewhere on the spectrum are other lower-risk products, including low-nitrosamine smokeless tobacco products and electronic nicotine-delivery systems (ENDS, which include

e-cigarettes), and higher-risk products, including combustible tobacco products other than cigarettes (such as cigars, cigarillos, and hookah tobacco). Although no one has precisely characterized the relative risk associated with each of these products, research suggests that low-nitrosamine smokeless tobacco products pose no more than one tenth the risk of cigarettes, whereas the risk associated with other combustible-tobacco products may approach that of cigarettes.¹ Because ENDS products are so new and varied, the risk associated with them remains to be established, although early evidence suggests they are substantially less harmful than combustibles.²

Extensive research demonstrates that higher tobacco taxes can help promote quitting among current users, deter initiation among potential users, and reduce tobacco use among continuing users.³ Studies have also shown that changes in the relative prices of tobacco products lead some tobacco users to switch to less expensive products.³ Given the belief that all tobacco products are seriously deleterious to health, conventional wisdom in the tobacco-control world has long been that all products should be taxed similarly. For example, the World Health Organization states that adopting “comparable taxes and tax increases on all tobacco products” is a best practice for tobacco taxation.⁴

To some extent, the 2009 U.S. federal tobacco-tax increases reflected this strategy: taxes on historically lower-taxed products were increased by much more than taxes on products that had previously been taxed at higher

rates (see graph). Whereas the cigarette tax rose from \$0.39 to \$1.0067 per pack (a 158% increase), taxes on roll-your-own tobacco rose from \$1.0969 to \$24.78 per pound (a 2159% increase) and taxes on small cigars rose from \$1.828 to \$50.33 per 1000 (a 2653% increase). The snuff tax rose by the same 158% as the cigarette tax. Many states have taken a similar approach, increasing taxes on noncigarette tobacco products by a greater amount than taxes on cigarettes in order to achieve greater parity between products.

As sales of ENDS have skyrocketed, interest in taxing them has grown as well. As of early 2015, Minnesota and North Carolina were the only states that had adopted taxes on ENDS. Minnesota taxes ENDS as tobacco products, levying the same tax of 95% of wholesale price that it applies to snuff and chewing and smoking tobacco. In contrast, North Carolina created a new, very low, ENDS-specific tax of \$0.05 per milliliter of consumable solution. Several other states, counties, and cities are considering legislation to impose a tax on ENDS.

The rapid evolution of the nicotine-product marketplace suggests that it's time to rethink the idea that similar taxes are best practice. We believe that national, state, and local policymakers should consider an approach that differentially taxes nicotine products in order to maximize incentives for tobacco users to switch from the most harmful products to the least harmful ones. Sizable public health benefits could derive from current cigarette smokers' switching to ENDS and other noncombustible products, includ-

ing nicotine-replacement therapies (as the one type of nicotine product demonstrated to be safe, nicotine-replacement therapy should not be subject to any excise tax).¹

Sweden, which has Europe's lowest tobacco-attributable mortality among men, provides a good example of how this approach can succeed. There, lower taxes on snus — a form of smokeless tobacco — contributed to many male cigarette smokers switching to snus. Women, however, did not switch to the same extent, which illustrates that price differentials alone are not always sufficient to achieve public health goals.⁵

Policymakers should consider an approach that differentially taxes nicotine products in order to maximize incentives for tobacco users to switch from the most harmful products to the least harmful ones.

The manner in which a differential taxation system is implemented will determine how well it works as a harm-reduction strategy. To alleviate concerns that low prices on ENDS and lower-risk tobacco products might encourage uptake among young people, taxes on such products could be set high enough to discourage initiation. At the same time, taxes on combustible products could be further increased in order to raise their prices relative to less harmful noncombustible products. Such a strategy would maximize the likelihood of current smokers switching to

lower-risk products while deterring users of lower-risk products from switching to more harmful ones. Higher prices for combustible products would have the added benefit of further reducing the likelihood that young people would take up smoking.

The current approach of imposing taxes on ENDS or raising taxes on cigarettes and other combustible products by the same amount as taxes on snus and other smokeless products has the opposite effect: it discourages tobacco users from switching to reduced-risk products, encourages dual use, and increases the likelihood that young people who initiate nicotine use will start with

between combustible and non-combustible tobacco products is well established.

Given the FDA's regulatory authority over the manufacture, distribution, and marketing of tobacco products, a differential taxation strategy could be complemented by other policies, such as restrictions on ENDS marketing and strong product standards, to maximize public health benefit. Perhaps most important, as proposed in the FDA's recent "deeming" rule, the agency's authority over tobacco products could be extended to cover additional products including ENDS, opening up such items to new regulation. Policymakers could then make a product's eligibility for a lower tax rate dependent on the FDA's determination that it poses substantially reduced risk.

We believe that implementing differential taxes on nicotine-yielding products on the basis of degree of risk could substantially expedite the move away from cigarette smoking that has occurred during the past half-century, especially now that there are nicotine-yielding products that pose dramatically less danger than combustible tobacco products. Nearly a fifth of U.S. adults are cigarette smokers, and smoking accounts for one of every five deaths in the United States. Failure to seriously entertain a differential taxation approach may contribute to the prolongation of the epidemic of disease and death caused by smoking.

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the most dangerous products.

A differential taxation strategy is not without potential problems. Decades ago, proposals were floated to tax cigarettes at different rates on the basis of tar and nicotine content. The United Kingdom and New York City adopted this approach, briefly levying special taxes on high-tar cigarettes. As evidence grew that cigarettes with lower tar and nicotine levels were no less dangerous, however, public health authorities realized that a differential taxation strategy was undesirable. Yet today the science supporting a difference in risk

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POLICY ANALYSIS

MARCH 31, 2015

E-Cigarettes Poised to Save Medicaid Billions

J. Scott Moody, Chief Executive Officer and Chief Economist

Electronic cigarettes (e-cigs) have only been around since 2006, yet their potential to dramatically reduce the damaging health impacts of traditional cigarettes has garnered significant attention and credibility. Numerous scientific studies show that e-cigs not only reduce the harm from smoking, but can also be a part of the successful path to smoking cessation.

The term “e-cig” is misleading because there is no tobacco in an e-cig, unlike a traditional, combustible cigarette. The e-cig uses a battery-powered vaporizer to deliver nicotine via a propylene-glycol solution—which is why “smoking” an e-cig is called “vaping.” The vapor is inhaled like a smoke from a cigarette, but does not contain the carcinogens found in tobacco smoke.

Unlike traditional nicotine replacement therapy (NRT), such as gum or patches, e-cigs mimic the physical routine of smoking a cigarette. As such, e-cigs fulfill both the chemical need for nicotine and physical stimuli of smoking. This powerful combination has led to the increasing demand for e-cigs—8.2% use among nondaily smokers and 6.2% use among daily smokers in 2011.¹

The game-changing potential for dramatic harm reduction by current smokers using e-cigs will flow directly into lower healthcare costs dealing

with the morbidity and mortality stemming from smoking combustible cigarettes. These benefits will particularly impact the Medicaid system where the prevalence of cigarette smoking is twice that of the general public (51% versus 21%, respectively).

Based on the findings of a rigorous and comprehensive study on the impact of cigarette smoking on Medicaid spending, the potential savings of e-cig adoption, and the resulting tobacco smoking cessation and harm reduction, could have been up to \$48 billion in Fiscal Year (FY) 2012.² This savings is 87% higher than all state cigarette tax collections and tobacco settlement collections (\$24.4 billion) collected in that same year.

Unfortunately, the tantalizing benefits stemming from e-cigs may not come to fruition if artificial barriers slow their adoption among current smokers. These threats range from the Food and Drug Administration regulating e-cigs as a pharmaceutical to states extending their cigarette tax to e-cigs. To be sure, e-cigs are still a new product and should be closely monitored for long-term health effects. However, given the long-term fiscal challenges facing Medicaid, the prospect of large e-cigs cost savings is worth a non-interventionist approach until hard evidence proves otherwise.

Prevalence of Smoking in the Medicaid Population

According to the Centers for Disease Control and Prevention, in 2011, 21.2% of Americans smoked combustible cigarettes. However, as shown in Table 1, the smoking rate varies considerably across states with the top three states being Kentucky (29%), West Virginia (28.6%), and Arkansas (27%) and the three lowest states being Utah (11.8%), California (13.7%), and New Jersey (16.8%).³

Additionally, the smoking rate varies dramatically by income level. Nearly 28% of people living below the poverty line smoke while 17% of people living at or above the poverty line smoke.⁴

As a consequence, the level of smoking prevalence among Medicaid recipients is more than twice that of the general public, 51% versus 21%, respectively. However, this too varies considerably across states with the top three states being New Hampshire (80%), Montana (70%), and Pennsylvania (70%) and the three lowest states being Mississippi (35%), New Jersey (36%), and South Carolina (41%).⁵

In absolute terms, the U.S. Medicaid system includes 36 million smokers out of a total Medicaid enrollment of over 68 million. As such, this places much of the health burden and related financial cost of smoking on the Medicaid system which strains the system and takes away scarce resources from the truly needy.

Economic Benefit of Smoking Cessation and Harm Reduction

Smoking creates large negative externalities due to adverse health impacts. Table 2 shows the results of a comprehensive study that quantified the two major costs of smoking in 2009—lost productivity and healthcare costs.⁶

Lost productivity occurs when a person dies prematurely due to smoking or misses time

from work due to smoking. This cost the economy \$185 billion in lost output in 2009.

State	Percent Smokers		Medicaid Enrollment	Number of Smokers on Medicaid
	Medicaid	General Population		
United States	51%	21.2% (median)	68,372,045	36,461,209
Alabama	52%	24.3%	938,313	487,923
Alaska	68%	22.9%	135,059	91,840
Arizona	49%	19.2%	1,989,470	974,840
Arkansas	54%	27.0%	777,833	420,030
California	45%	13.7%	11,500,583	5,175,262
Colorado	61%	18.3%	733,347	447,342
Connecticut	49%	17.1%	729,294	357,354
Delaware	58%	21.7%	223,225	129,471
Florida	46%	19.3%	3,829,173	1,761,420
Georgia	42%	21.2%	1,925,269	808,613
Hawaii	62%	16.8%	313,629	194,450
Idaho	62%	17.2%	409,456	253,863
Illinois	58%	20.9%	2,900,614	1,682,356
Indiana	68%	25.6%	1,208,207	821,581
Iowa	61%	20.4%	544,620	332,218
Kansas	54%	22.0%	363,755	196,428
Kentucky	65%	29.0%	1,065,840	692,796
Louisiana	43%	25.7%	1,293,869	556,364
Maine	63%	22.8%	327,524	206,340
Maryland	51%	19.1%	1,003,548	511,809
Massachusetts	53%	18.2%	1,504,611	797,444
Michigan	64%	23.3%	2,265,277	1,449,777
Minnesota	54%	19.1%	989,600	534,384
Mississippi	35%	26.0%	775,314	271,360
Missouri	66%	25.0%	1,126,505	743,493
Montana	70%	22.1%	136,442	95,509
Nebraska	64%	20.0%	284,000	181,760
Nevada	62%	22.9%	363,357	225,281
New Hampshire	80%	19.4%	152,182	121,746
New Jersey	36%	16.8%	1,304,257	469,533
New Mexico	50%	21.5%	571,621	285,811
New York	54%	18.1%	5,421,232	2,927,465
North Carolina	63%	21.8%	1,892,541	1,192,301
North Dakota	63%	21.9%	85,094	53,609
Ohio	65%	25.1%	2,526,533	1,642,246
Oklahoma	58%	26.1%	852,603	494,510
Oregon	67%	19.7%	690,364	462,544
Pennsylvania	70%	22.4%	2,443,909	1,710,736
Rhode Island	48%	20.0%	221,041	106,100
South Carolina	41%	23.1%	978,732	401,280
South Dakota	69%	23.0%	134,798	93,011
Tennessee	58%	23.0%	1,488,267	863,195
Texas	43%	19.2%	4,996,318	2,148,417
Utah	54%	11.8%	366,271	197,786
Vermont	67%	19.1%	184,088	123,339
Virginia	58%	20.9%	1,016,419	589,523
Washington	67%	17.5%	1,371,987	919,231
West Virginia	67%	28.6%	411,218	275,516
Wisconsin	63%	20.9%	1,292,799	814,463
Wyoming	62%	23.0%	76,372	47,351
District of Columbia	51%	20.8%	235,665	120,189

Source: Centers for Disease Control and Prevention, Centers for Medicare and Medicaid Services, and State Budget Solutions



Smokers incur higher healthcare costs when those individuals require medical services such as ambulatory care, hospital care, prescriptions, and neonatal care for conditions caused by smoking. This cost the economy \$116 billion in extra medical treatments.

Overall, in 2009 alone, the negative externalities of smoking cost the U.S. economy \$301 billion in lost productivity and higher healthcare costs. Not surprisingly, these costs were centered in high population states such as California (\$26.9 billion), New York (\$20.6 billion), and Texas (\$20.4 billion).

Literature Review On E-cig Impact On Harm Reduction Through Reduced Toxic Exposure and Smoking Cessation

E-cigs have only been around since 2006, yet their potential to dramatically reduce the damaging health impacts of traditional combustible cigarettes has garnered significant attention and credibility. Numerous scientific studies are showing that e-cigs not only reduce the harm from smoking, but is also a successful path to smoking cessation.

In perhaps the most comprehensive e-cig literature review to date, Neil Benowitz et al. (2014) identified eighty-one studies with original data and evidence from which to judge e-cig effectiveness for harm reduction.⁷ They concluded:

“Allowing EC (electronic cigarettes) to compete with cigarettes in the market-place might decrease smoking-related morbidity and mortality. Regulating EC as strictly as cigarettes, or even more strictly as some regulators propose, is not warranted on current evidence. Health professionals may consider advising smokers unable or unwilling to quit through other routes to switch to EC as a safer alternative to smoking and a possible pathway to complete cessation of nicotine use.”

There are two ways that e-cigs benefit current smokers. First, there is harm reduction for the smoker by removing exposure to the toxicity

State	Lost Productivity			Healthcare Costs	Total Smoking Costs
	Premature Death	Workplace	Total		
United States	117.1	67.5	184.6	116.4	301.0
Alabama	2.7	1.2	3.9	1.7	5.6
Alaska	0.2	0.2	0.4	0.3	0.7
Arizona	1.9	1.3	3.2	1.9	5.1
Arkansas	1.7	0.7	2.4	1.1	3.4
California	9.6	5.7	15.2	11.6	26.9
Colorado	1.3	1.2	2.5	1.6	4.1
Connecticut	1.2	0.7	1.8	1.7	3.6
Delaware	0.4	0.2	0.6	0.4	1.1
District of Columbia	0.3	0.1	0.4	0.5	0.9
Florida	7.9	4.4	12.3	7.3	19.6
Georgia	3.7	2.4	6.2	2.9	9.0
Hawaii	0.4	0.2	0.7	0.4	1.1
Idaho	0.4	0.3	0.7	0.4	1.1
Illinois	5.0	2.9	7.9	4.8	12.7
Indiana	3.0	2.1	5.1	2.6	7.7
Iowa	1.2	0.7	1.9	1.1	3.0
Kansas	1.0	0.6	1.6	1.0	2.6
Kentucky	2.6	1.3	3.9	1.8	5.7
Louisiana	2.4	0.9	3.3	1.8	5.1
Maine	0.6	0.3	0.9	0.7	1.6
Maryland	2.1	1.3	3.4	2.2	5.6
Massachusetts	2.2	1.3	3.4	3.7	7.1
Michigan	4.5	2.4	7.0	4.0	11.0
Minnesota	1.5	1.5	3.0	2.3	5.4
Mississippi	1.8	0.7	2.4	1.0	3.5
Missouri	3.0	1.5	4.5	2.7	7.2
Montana	0.3	0.2	0.6	0.4	0.9
Nebraska	0.6	0.5	1.1	0.7	1.8
Nevada	1.1	0.7	1.7	0.9	2.6
New Hampshire	0.5	0.3	0.8	0.6	1.4
New Jersey	2.9	1.8	4.7	3.6	8.3
New Mexico	0.5	0.4	0.9	0.6	1.5
New York	6.9	3.9	10.8	9.8	20.6
North Carolina	4.1	2.2	6.3	3.4	9.7
North Dakota	0.2	0.2	0.4	0.3	0.7
Ohio	5.7	2.9	8.6	5.2	13.9
Oklahoma	2.1	0.9	3.0	1.3	4.3
Oregon	1.3	0.8	2.1	1.3	3.4
Pennsylvania	5.4	3.2	8.5	5.7	14.2
Rhode Island	0.4	0.2	0.7	0.6	1.3
South Carolina	2.3	1.0	3.3	1.6	4.9
South Dakota	0.3	0.2	0.5	0.3	0.8
Tennessee	3.6	1.7	5.3	2.6	7.9
Texas	7.9	4.9	12.8	7.6	20.4
Utah	0.4	0.3	0.7	0.4	1.1
Vermont	0.2	0.1	0.4	0.3	0.7
Virginia	2.9	2.0	4.8	2.7	7.5
Washington	2.1	1.3	3.4	2.4	5.7
West Virginia	1.1	0.5	1.6	0.9	2.5
Wisconsin	2.0	1.4	3.4	2.4	5.8
Wyoming	0.2	0.2	0.4	0.2	0.6

Source: See Endnote 6 and State Budget Solutions



associated with the thousands of compounds, many carcinogenic, found in the burning of tobacco and the resulting smoke. Second, smoking cessation efforts by the smoker are enhanced by simultaneously fulfilling both the chemical need for nicotine and physical stimuli of smoking.

In the last few years the academic literature has exploded with articles on these two topics. The following is a selection of some of the most recent studies and their conclusions.

Reduced Toxic Exposure

Igor Burstyn (2014) concludes, “Current state of knowledge about chemistry of liquids and aerosols associated with electronic cigarettes indicates that there is no evidence that vaping produces inhalable exposures to contaminants of the aerosol that would warrant health concerns by the standards that are used to ensure safety of workplaces . . . Exposures of bystanders are likely to be orders of magnitude less, and thus pose no apparent concern.”⁸

Neal Benowitz, et al. (2013) concludes, “The vapour generated from e-cigarettes contains potentially toxic compounds. However, the levels of potentially toxic compounds in e-cigarette vapour are 9–450-fold lower than those in the smoke from conventional cigarettes, and in many cases comparable with the trace amounts present in pharmaceutical preparation. Our findings support the idea that substituting tobacco cigarettes with electronic cigarettes may substantially reduce exposure to tobacco-specific toxicants. The use of e-cigarettes as a harm reduction strategy among cigarette smokers who are unable to quit, warrants further study.”⁹

Kostantinos E Farsalinos et al. (2014) concludes, “Although acute smoking inhalation caused a delay in LV (Left Ventricular) myocardial relaxation in smokers, electronic cigarette use was found to have no such immediate effects in daily users of the device. This short-term beneficial profile of electronic cigarettes compared to smoking, although not conclusive about its overall health-effects as a tobacco harm reduc-

tion product, provides the first evidence about the cardiovascular effects of this device.”¹⁰

Smoking Cessation

Emma Beard et al. (2014) concludes, “Among smokers who have attempted to stop without professional support, those who use e-cigarettes are more likely to report continued abstinence than those who used a licensed NRT [Nicotine Replacement Therapy] product bought over-the-counter or no aid to cessation. This difference persists after adjusting for a range of smoker characteristics such as nicotine dependence.”¹¹

Christopher Bullen et al. (2013) concludes, “E-cigarettes, with or without nicotine, were modestly effective at helping smokers to quit, with similar achievement of abstinence as with nicotine patches, and few adverse events . . . Furthermore, because they have far greater reach and higher acceptability among smokers than NRT [Nicotine Replacement Therapy], and seem to have no greater risk of adverse effects, e-cigarettes also have potential for improving population health.”¹²

Pasquale Caponnetto et al. (2013) concludes, “The results of this study demonstrate that e-cigarettes hold promise in serving as a means for reducing the number of cigarettes smoked, and can lead to enduring tobacco abstinence as has also been shown with the use of FDA-approved smoking cessation medication. In view of the fact that subjects in this study had no immediate intention of quitting, the reported overall abstinence rate of 8.7% at 52-weeks was remarkable.”¹³

Konstantinos E. Farsalinos et al. (2013) concludes, “Participants in this study used liquids with high levels of nicotine in order to achieve complete smoking abstinence. They reported few side effects, which were mostly temporary; no subject reported any sustained adverse health implications or needed medical treatment. Several of the side effects may not be attributed to nicotine. In addition, almost every vaper reported significant benefits from switching to the EC [e-cigarette]. These observations are consistent with findings of Internet surveys and are supported by studies showing

that nicotine is not cytotoxic, is not classified as a carcinogen, and has minimal effects on the initiation or propagation of atherosclerosis . . . Public health authorities should consider this and other studies that ECs are used as long-term substitutes to smoking by motivated exsmokers and should adjust their regulatory decisions in a way that would not restrict the availability of nicotine-containing liquids for this population.”¹⁴

Potential E-cig Medicaid Cost Savings

To date, the academic literature strongly suggests that e-cigs hold the promise of dramatic harm reduction for smokers simply by switching from combustible tobacco cigarettes to e-cigs. This harm reduction is due to both its positive impact on smoking cessation and reduced exposure to toxic compounds in cigarette smoke.

As a result, we can expect the healthcare costs of smoking to decline over time as the adoption of e-cigs by smokers continues to grow. Additionally, we can expect greater rates of adoption as e-cigs continue to evolve and improve based on market feedback—a dynamic that has never existed with other nicotine replacement therapies.

As discussed earlier, the potential savings to the economy are very large. In terms of healthcare alone, most of that cost is currently borne by the Medicaid system where the prevalence of cigarette smoking is twice that of the general public, 51% versus 21%, respectively. So what are the potential healthcare savings to Medicaid?

Brian S. Armour et al. (2009) created an impressive economic model to estimate how much smoking costs Medicaid based on data from the Medical Expenditure Panel Survey and the Behavioral Risk Factor Surveillance System.¹⁵

Overall, their model “. . . included 16,201 adults with weighting variables that allowed us to generate state representative estimates of the

State	Medicaid Spending	Smoking Costs as Percent of Medicaid Spending	Smoking Costs on Medicaid
United States	415,154	11%	45,667
Alabama	5,027	9%	452
Alaska	1,348	15%	202
Arizona	7,905	18%	1,423
Arkansas	4,160	11%	458
California	50,165	11%	5,518
Colorado	4,724	17%	803
Connecticut	6,759	7%	473
Delaware	1,485	10%	148
District of Columbia	2,111	11%	232
Florida	17,907	11%	1,970
Georgia	8,526	10%	853
Hawaii	1,493	11%	164
Idaho	1,452	14%	203
Illinois	13,393	11%	1,473
Indiana	7,486	15%	1,123
Iowa	3,495	10%	350
Kansas	2,667	12%	320
Kentucky	5,702	12%	684
Louisiana	7,358	12%	883
Maine	2,413	14%	338
Maryland	7,687	12%	922
Massachusetts	12,926	11%	1,422
Michigan	12,460	13%	1,620
Minnesota	8,894	11%	978
Mississippi	4,466	9%	402
Missouri	8,727	14%	1,222
Montana	973	15%	146
Nebraska	1,722	15%	258
Nevada	1,739	11%	191
New Hampshire	1,187	15%	178
New Jersey	10,389	6%	623
New Mexico	3,430	12%	412
New York	53,306	11%	5,864
North Carolina	12,282	11%	1,351
North Dakota	744	12%	89
Ohio	16,352	13%	2,126
Oklahoma	4,642	12%	557
Oregon	4,587	15%	688
Pennsylvania	20,393	11%	2,243
Rhode Island	1,856	8%	148
South Carolina	4,848	11%	533
South Dakota	749	16%	120
Tennessee	8,798	11%	968
Texas	28,286	11%	3,111
Utah	1,903	14%	266
Vermont	1,353	15%	203
Virginia	6,906	11%	760
Washington	7,560	18%	1,361
West Virginia	2,790	11%	307
Wisconsin	7,096	13%	923
Wyoming	528	16%	85

Note: States do not sum to Total due to rounding.
Source: See Endnote 15 and State Budget Solutions

adult, noninstitutionalized Medicaid population.”

The study concluded that 11% of all Medicaid expenditures can be attributed to smoking. Additionally, among the states these costs ranged from a high of 18% (Arizona and Washington) to a low of 6% (New Jersey).

This study uses their percentage of Medicaid spending due to smoking and applies it to the latest year of available state-by-state Medicaid spending. As shown in Table 3, in FY 2012, smoking cost the Medicaid system \$45.7 billion. Of course, the largest states bear the brunt of these costs such as New York (\$5.9 billion), California (\$5.5 billion), and Texas (\$3.1 billion).

To put this potential savings to Medicaid into perspective, in FY 2012, state governments and the District of Columbia combined collected \$24.4 billion in cigarette excise taxes and tobacco settlement payments. As shown in Table 4, the potential Medicaid savings exceeds cigarette excise tax collections and tobacco settlement payments by 87%.

However, this varies greatly by state with high ratios in the South Carolina (435%), Missouri (409%), and New Mexico (260%), Arizona (238%), and California (238%) and low ratios in New Jersey (-39%), New Hampshire (-31%), Rhode Island (-17%), Connecticut (-13%), and Hawaii (-4%). Overall, 45 states and D.C. stand to gain more from potential Medicaid savings than through lost cigarette tax collections and tobacco settlement payments.

Note that many of the five states with negative ratios are distorted because excise tax collections are based on where the initial sale occurred and not where the cigarettes were ultimately consumed. This can vary greatly because of cigarette smuggling and cross-border shopping created by state-level differentials in cigarette excise taxes.¹⁶

For instance, New Hampshire has long been a source for out-of-state cigarette purchase from shoppers living in Massachusetts, Maine, and Vermont because of its lower cigarette excise

Table 4
Smoking Costs on Medicaid Exceeds State Cigarette Tax Collections and Tobacco Settlement Payments
(Millions of Dollars)
Fiscal Year 2012

State	State Cigarette Tax Collections (a)	Tobacco Settlement Payments (b)	Smoking Costs on Medicaid	Smoking Costs on Medicaid as a Percent of State Cigarette Tax Collections and Tobacco Settlement Payments
United States	17,226	7,190	45,667	87%
Alabama	126	94	452	106%
Alaska	67	30	202	108%
Arizona	319	101	1,423	238%
Arkansas	247	51	458	54%
California	896	736	5,518	238%
Colorado	203	91	803	173%
Connecticut	418	124	473	-13%
Delaware	121	27	148	1%
District of Columbia	36	38	232	214%
Florida	381	365	1,970	164%
Georgia	227	141	853	132%
Hawaii	122	49	164	-4%
Idaho	48	25	203	177%
Illinois	606	274	1,473	67%
Indiana	465	130	1,123	89%
Iowa	225	66	350	20%
Kansas	104	58	320	98%
Kentucky	277	102	684	81%
Louisiana	133	141	883	222%
Maine	140	51	338	77%
Maryland	411	146	922	66%
Massachusetts	574	254	1,422	72%
Michigan	965	256	1,620	33%
Minnesota	422	167	978	66%
Mississippi	157	110	402	50%
Missouri	105	135	1,222	409%
Montana	87	30	146	24%
Nebraska	68	38	258	145%
Nevada	103	40	191	34%
New Hampshire	215	43	178	-31%
New Jersey	792	231	623	-39%
New Mexico	75	39	412	260%
New York	1,632	738	5,864	147%
North Carolina	295	141	1,351	210%
North Dakota	28	32	89	49%
Ohio	843	295	2,126	87%
Oklahoma	293	77	557	50%
Oregon	256	79	688	106%
Pennsylvania	1,119	337	2,243	54%
Rhode Island	132	47	148	-17%
South Carolina	26	73	533	435%
South Dakota	60	24	120	42%
Tennessee	279	139	968	131%
Texas	1,470	475	3,111	60%
Utah	124	36	266	66%
Vermont	80	35	203	77%
Virginia	192	117	760	145%
Washington	471	151	1,361	119%
West Virginia	110	64	307	77%
Wisconsin	653	131	923	18%
Wyoming	26	19	85	90%

(a) Includes all forms of tobacco taxes.
(b) Includes Master Settlement Agreement and individual state payments.
Source: Department of Commerce: Census Bureau, Internal Revenue Service, and State Budget Solutions

tax. As such, the ratio is too high for Massachusetts, Maine, and Vermont and too low for New Hampshire. The same applies to New Jersey and Connecticut vis-à-vis New York and, more specifically, New York City, which levies its own cigarette tax on top of the state tax.

Hawaii is an exception due to its physical isolation which creates monopoly rents. Rhode Island levies a very high cigarette excise tax, but not relatively high enough compared to neighboring Connecticut and Massachusetts to drive a lot of cross-border shopping.

Other Potential E-cig Cost Savings

Another area of cost savings from greater e-cig adoption is the reduction in smoke and fire dangers in subsidized and public housing. According to a recent study, smoking imposes three major costs:

1. Increased healthcare costs from exposure to second hand smoke within and between housing units.
2. Increased renovation costs of smoking-permitted housing units.
3. Fires attributed to cigarettes.

As shown in Table 5, the study estimates that smoking imposes a nationwide cost of nearly \$500 million.¹⁷ The top three states facing the greatest expenses are New York (\$125 million), California (\$72 million), and Texas (\$24 million) while the top three states with the lowest expenses are Wyoming (\$0.6 million), Idaho (\$0.8 million), and Montana (\$1 million).

Applying Cigarette Taxes to E-cigs?

Many policymakers around the country have suggested applying the existing cigarette tax, wholly or in part, to e-cigs. This is bad public policy and is based on a fundamental misunderstanding of the cigarette tax.

The cigarette tax is what economists call a “Pigovian Tax” which is designed to mitigate

State	Smoking Costs
United States	496.8
New York	124.7
California	72.4
Texas	28.3
Massachusetts	24.0
Florida	23.2
Ohio	21.7
Pennsylvania	17.7
New Jersey	15.8
Louisiana	14.4
North Carolina	13.9
Illinois	13.3
Tennessee	12.9
Michigan	12.8
Alabama	12.4
Georgia	11.6
Connecticut	10.7
Missouri	9.4
Indiana	8.3
Virginia	7.8
Mississippi	7.2
Kentucky	7.1
Minnesota	7.1
South Carolina	7.0
Maryland	7.0
Arkansas	6.8
Oklahoma	6.8
Wisconsin	6.5
Washington	5.0
Arizona	4.9
Colorado	4.5
West Virginia	4.3
Oregon	4.3
Maine	4.2
Rhode Island	4.0
Hawaii	3.8
Iowa	3.8
New Mexico	3.0
Kansas	2.9
Nebraska	2.1
Nevada	1.9
Vermont	1.9
New Hampshire	1.9
Utah	1.4
Delaware	1.3
North Dakota	1.2
South Dakota	1.1
Montana	1.0
Idaho	0.8
Wyoming	0.6
Alaska	N.A.
District of Columbia	N.A.

Source: See Endnote 17 and State Budget Solutions

negative externalities of certain actions. Cigarette smoking creates many negative externalities such as harmful health consequences to the user or to those in near proximity (second-hand smoke).

As detailed in this study, the negative externalities associated with traditional smoking are all but eliminated by e-cigs. Without evidence of actual negative externalities, applying the existing cigarette tax to e-cigs is simply bad public policy.

Conclusion

Policymakers have long sought to reduce the economic damage due to the negative health impact of smoking. They have used tactics ranging from cigarette excise taxes to subsidizing nicotine replacement therapies. To be sure, smoking prevalence has fallen over time, but there is more that can be done, especially given the fact that so much of the healthcare burden of smoking falls on the already strained Medicaid system.

As with any innovation, no one could have predicted the sudden arrival into the marketplace of the e-cig in 2006. Since e-cigs fulfill both the chemical need for nicotine and physical stimuli of smoking the demand for e-cigs has grown dramatically. The promise of a relatively safe way to smoke has the potential to yield enormous healthcare savings. The most current academic research verifies the harm reduction potential of e-cigs.

As shown in this study, the potential savings to Medicaid significantly exceeds the state revenue raised from the cigarette excise tax and tobacco settlement payments by 87%. As such, the rational policy decision is to adopt a non-interventionist stance toward the evolution and adoption of the e-cig until hard evidence proves otherwise. While cigarette tax collections will fall as a result, Medicaid spending will fall even faster. This is a win-win for policymakers and taxpayers.

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DC Launches Anti-Smoking Campaign A Week Before Taxing Vape Shops Out Of Existence

Posted By [Josh Fatzick](#) On 4:38 PM 09/24/2015 In | [No Comments](#)

D.C. Council Member Yvette Alexander announced Tuesday that the week of Sept. 20, 2015, would forever be known as “DC Calls It Quits Week.”

The announcement comes just one week before the city plans to implement a 67 percent tax on e-cigarettes, effectively taxing vape shops out of existence.

Alexander brought a gaggle of people to the front of the council chambers to make the announcement and to encourage “everyone in the District of Columbia to put down those cigarettes.”

“Put down those tobacco product today, and hopefully this can be the beginning of a new beginning for anyone who smokes cigarettes, cigars, pipes, even marijuana,” she declared while being congratulated by fellow council members and community activists.

Alexander introduced a [ceremonial resolution](#) and rattled off a litany of statistics regarding the ill effects of tobacco use and the difficulty of quitting, in order to make the week officially recognized by the city.

“Smokers desiring to quit should have access to approved therapies, such as counseling, nicotine replacement therapy — and that does not include electronic cigarettes — pharmaceutical interventions, as well as multiple channels for outreach and support,” she said.

“I had to throw that in there,” Alexander quickly added, referring to the e-cigarettes.

Earlier this summer, the city passed [The Vapor Product Amendment Act of 2015](#), a small provision in the 2016 budget support act, that adds e-cigarettes to the list of “other tobacco products” that are already taxed at a higher rate.

Prior to the tax hike, which will take effect Oct. 1, vape products were only taxed at the 5.75 percent sales tax rate, like most other products sold in the city.

Dave Oberting, a candidate for D.C. Council and executive director of the Economic Growth DC Foundation, told The Daily Caller News Foundation that the tax on e-cigarettes is simply just not a good use of the tax code.

“Taxes should be used to raise revenue and not to micromanage human behavior,” he said. “In this case, the District has managed to destroy four small businesses and discourage the use of a safer alternative to smoking at the same time.”

According to a Committee on Health and Human Services report, the city expects the tax to bring in \$380,000 additional dollars in 2016, though that may not be the case.

“The city very may well lose revenue as a result of this tax,” Greg Conley, president of the American Vaping Association, told TheDCNF.

That’s because, already, two of the four vape shops in the city have said the tax will force them to close their doors.

Fadi Khalaf [told](#) TheDCNF he has already made plans to close M Street Vape, a store he opened less than six months ago in downtown Washington. He said he just doesn’t make nearly enough profit to pay a 70 percent tax.

According to Conley, it’s not just the city that will lose out when the vape shops close up, but it will disproportionately hurt poor people in the city who would like to give up smoking.

"This is the absurdity of the movement in the anti-tobacco community," he said. "This tax is forcing these people to keep inhaling burning smoke into their lungs."

These people will be unable to pay the 70 percent tax on e-cigarettes, which can be a heavy up-front investment for equipment, but cheaper than cigarettes in the long run.

Alexander did not return request for comment about how the new tax would impact poor people and vape shops.

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OPINION | COMMENTARY

The Misbegotten Crusade Against E-Cigarettes

'Long term e-cigarette use can substantially decrease cigarette consumption in smokers not willing to quit.'

By **MICHAEL B. SIEGEL**

Feb. 24, 2015 6:48 p.m. ET

When electronic cigarettes came to the U.S. about 2007, I was skeptical. My assumption was they were a ploy by the tobacco industry to hook more people into smoking under the guise of being a safer product—the notorious low-tar cigarette scam all over again. But as I talked to many e-cigarette users, known as “vapers,” conducted research (*Journal of Public Health Policy*, 2011) and reviewed a growing body of scientific evidence, I became convinced that e-cigarettes have dramatic potential for reducing disease and death caused by smoking.

Yet many in the antismoking movement—in which I have been involved for decades—are conducting a misleading campaign against these products. And this campaign may be doing harm to public health.

The most common claim about e-cigarettes is that they are a “gateway” to smoking. In September 2013 Thomas Frieden, director of the Centers for Disease Control and Prevention, said “many kids are starting out with e-cigarettes and then going on to smoke conventional cigarettes.” He added that electronic cigarettes are “condemning many kids to struggling with a lifelong

addiction to nicotine.”

These statements had no basis in fact when he made them, and the evidence is that they are bogus. One recent study in the *American Journal of Preventive Medicine* (January 2015) suggests that e-cigarettes are not acting as a gateway to smoking among youth. Another study in the journal *Drug and Alcohol Dependence* (February 2015) suggests the addictive potential of e-cigarettes is substantially lower than that of tobacco cigarettes.

Electronic cigarettes might even be a deterrent to tobacco addiction. Their use by high-school youth tripled between 2011 and 2013, rising from 1.5% to 4.5%, according to CDC data, and then, according to a University of Michigan study, skyrocketed in 2014, when 16% of 10th-graders and 17% of 12th-graders reported using them. That study reports a decline in youth smoking to a historically low level in these years, with smoking among 10th-graders dropping to 7.2% from 11.8% and among 12th-graders falling to 13.6% from 18.7%.



PHOTO: GETTY IMAGES

Other unfounded fears about e-cigarettes abound. There is no evidence that e-cigarettes entice ex-smokers to return to nicotine use and then back to cigarette smoking. There also is no evidence that e-cigarettes are hindering the quitting process for smokers who—if not for

e-cigarettes—would have quit completely. What we do know suggests that e-cigarettes are indeed a gateway: a one-way gateway away from combustible cigarettes and toward a much safer alternative product.

Are electronic cigarettes safe? Of course not. But e-cigarettes don't need to be absolutely safe. By definition, harm reduction involves an alternative product that is much safer. As electronic cigarettes contain no tobacco and do not involve combustion, they do not expose users to most of the more than 60 carcinogens in tobacco smoke, and they appear to be safer by orders of magnitude.

Still, to address legitimate safety concerns, the Food and Drug Administration should set uniform safety standards for e-cigarettes and “vaping” products. These standards should include childproof packaging, battery safety, quality-control standards for nicotine labeling and for the production of e-liquids, and modest regulation of flavorings such as a ban on diacetyl, a flavoring which when inhaled can cause a rare form of obstructive lung disease. The temperature of the coils also needs to be regulated to prevent overheating of the e-liquid, which results in the production of formaldehyde, a recognized carcinogen.

These regulations would go far toward maximizing the benefits of e-cigarettes while minimizing the risks. But instead of working to get them, the products are being demonized by those who should know better.

Earlier this month the California Department of Public Health published a pamphlet, “Protect Your Family From E-Cigarettes,” that claimed “E-cigarettes are just as addictive as regular cigarettes.” This flies in the face of the research published in December by the journal *Drug and Alcohol Dependence*, which showed that e-cigarettes are much less addictive than tobacco cigarettes. That study found that the addictiveness of e-cigarettes is equivalent to that of nicotine gum, an FDA-approved smoking cessation product.

The same pamphlet asserted that “studies show that e-cigarettes do not help people quit smoking cigarettes.” But a rigorous clinical trial in the *Lancet* showed e-cigarettes to be just as effective as the nicotine patch in getting smokers off cigarettes.

A January report by the California Department of Public Health on electronic cigarettes—“State Health Officer’s Report on E-Cigarettes: A Community Health Threat”—concludes that “there is no scientific evidence that e-cigarettes help smokers successfully quit traditional cigarettes.” But it does not cite the *Lancet* study, nor another, earlier clinical trial (*Internal and Emergency Medicine*, August 2014), which concluded that “long term e-Cigarette use can substantially decrease cigarette consumption in smokers not willing to quit and is well tolerated.”

Last month a *New England Journal of Medicine* article reported extremely high levels of formaldehyde in the aerosol of an electronic cigarette and concluded that vaping may therefore be more harmful than smoking. But the study was carried out under unrealistic conditions in which the e-liquid was severely overheated. Under more realistic conditions the study failed to detect any formaldehyde. Unfortunately, the e-cigarette cancer scare had already been

spread through the media.

In the U.K., the percentage of smokers quitting each year steadily declined until 2011, but increased from 2011 to 2014, a period when the proportion of smokers using e-cigarettes increased from 2% to 14%. A U.S. study (Nicotine & Tobacco Research, October 2014) reported that during the same period smokers who used e-cigarettes daily were six times more likely to quit than those who did not. This was extremely good news, but more recently the news is not so good.

Bloomberg Business reported last summer that e-cigarette sales began to slip in the U.S., and their use by smokers may even be declining in the U.K. The percentage of the public that believes smoking is more hazardous than electronic cigarettes has fallen to 65% in 2013 from 85% in 2010, according to a 2014 study in the American Journal of Preventive Medicine.

This is a tremendous lost opportunity. Vaping technology—or something like it that may be developed—has the potential to be one of the greatest antismoking breakthroughs. I would hate to see its promise wasted because of misinformation by the very public-health authorities who should be in the vanguard of reducing the harm from cigarettes.

Dr. Siegel, a professor at the Boston University School of Public Health, has conducted tobacco research for 25 years and has been an advocate for antismoking policies.

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COMMENTARY

The E-Cigarette Gateway Myth

The evidence is lacking that people who use them go on to become addicted to cigarette smoking.

By **MICHAEL B. SIEGEL**

Aug. 5, 2014 8:05 p.m. ET

Fifty years after the Surgeon General's landmark report on smoking and health, cigarettes remain the leading preventable cause of death in the U.S., and some 40 million Americans still smoke.

Enter the electronic cigarette, which has enormous potential to improve public health because many smokers can replace the deadly cigarettes that burn tobacco, producing tens of thousands of toxins, including more than 60 known human carcinogens. The e-cigarette is a battery-powered, smoke-free device that delivers nicotine vapor without most of the carcinogens produced by tobacco combustion. Yet it is feared and stigmatized by legislators and health officials, and may even be regulated out of existence.

One reason is the so-called gateway theory, which has been the subject of newspaper headlines and city council meetings, and even prompted a Senate investigation. Last September, in an interview with Medscape (a website for medical professionals) Thomas Frieden, director of the Centers for Disease Control and Prevention said that "many kids are starting out with e-cigarettes and then going on to smoke conventional cigarettes." The same month he was quoted by the Associated Press as warning that e-cigarettes are "condemning many kids to struggling with a lifelong addiction to nicotine."



E-cigarette GETTY IMAGES

The gateway hypothesis is a myth. The evidence shows that very few nonsmokers "vape." The primary reason people use e-cigarettes is to quit or cut back on smoking conventional cigarettes. Moreover, of the few nonsmoking youths who do experiment with

e-cigarettes, there is currently no evidence that they subsequently progress to cigarette smoking.

The first study to examine the gateway hypothesis was by Dr. Ted Wagener from the University of Oklahoma Health Sciences Center. His research, presented at the annual meeting of the American Association for Cancer Research last October, found only one young person out of a sample of 1,300 college students who initiated nicotine use with vapor products and then went on to smoke cigarettes.

In June, Dr. Constantine Vardavas of the Harvard School of Public Health published a broader analysis of 26,566 European smokers in the journal *Tobacco Control*. It showed that e-cigarette users are likely to be heavy smokers who have tried to kick the cigarette habit over the prior year. Dr. Vardavas and his two colleagues found that just 1% of nonsmokers tried vaporizing products like e-cigarettes.

Cigarette smoking among young people, whom public-health experts are rightfully focused on protecting from use of either type of product, continues to decline. The CDC's National Youth Risk Behavior Survey shows that teenage smoking has dropped over the last several years, falling to 15.7% in 2013 from 18.1% in 2011. The smoking rate among U.S. high-school students in 2013 was the lowest level since the survey began in 1991. Meanwhile, experimentation with e-cigarettes among high-school students doubled from 2011 to 2012.

Recent data from the U.K. confirm the same phenomenon. Despite a dramatic increase in e-cigarette experimentation among young people, smoking rates in

England in 2013 reached a historic low, according to a report from the U.K.'s Health and Social Care Information Centre.

By promoting a message that flies in the face of the government's own statistics—which show a sharp decline in youth smoking concurrent with a dramatic increase in e-cigarette experimentation—some federal public-health officials appear to be trying to create a "gateway" narrative where none exists.

The government has an obligation to carefully scrutinize any new consumer product that is presented as an alternative to smoking. But government agencies and public-health officials have no business discouraging or disparaging e-cigarettes in the absence of any data that they are causing harm. This is especially the case when these products have so much potential to curb cigarette smoking, the public health scourge that still claims half a million lives a year.

Dr. Siegel is a professor at Boston University's School of Public Health. He has 25 years of experience in tobacco control, including two years at the Centers for Disease Control and Prevention.

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