

are offset to a degree by revenue generated through fines.

One barrier to successful implementation of Tobacco 21 laws is the prospect of incomplete compliance by retailers. Compliance with the 18-year minimum has been variable, and interventions to boost compliance have had mixed success.<sup>5</sup> Some retailers may prove even more reluctant to comply with Tobacco 21 laws, particularly in challenging economic times, because they further undercut already-reduced sales revenue and lack the perceived moral force of laws that more explicitly aim to protect children.

Studies show that the extent to which such access restrictions reduce the prevalence of smoking among young people depends on the vigor with which authorities enforce them.<sup>5</sup> Strong incentives for enforcement activities can be provided through mechanisms such as the Synar Amendment, which made a portion of federal block grants from the Substance Abuse and Mental Health Services Administration conditional on states' willingness to adopt poli-

cies to restrict tobacco sales to minors and demonstrate high levels of compliance with these laws.

A forthcoming FDA report to Congress on the public health impact of raising the minimum tobacco-sales age could soon place Tobacco 21 legislation on the federal agenda. In the interim, further state and local policy leadership can help to generate effectiveness data to determine whether the policy merits nationwide adoption and what implementation problems should be anticipated.

According to a recent Gallup poll, nearly 90% of U.S. adults who smoke report that if they had it to do over again, they would not have started. Helping today's adolescents avoid that regret requires a comprehensive strategy that includes strong supply-side interventions. We believe that Tobacco 21 laws are a logical next step.

Disclosure forms provided by the authors are available with the full text of this article at NEJM.org.

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This article was published on January 8, 2014, at NEJM.org.

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DOI: 10.1056/NEJMp1314626

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## Smoke, the Chief Killer — Strategies for Targeting Combustible Tobacco Use

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January 2014 marks the 50th anniversary of the landmark *Smoking and Health: Report of the Advisory Committee to the Surgeon General of the Public Health Service* — an important moment to take stock of efforts to eliminate the harms of tobacco use. Smoking rates in the United States have decreased dramatically over the past 50 years. The prevalence of smoking among adults fell from

about 43% in 1965 to about 18% in 2012, meaningfully reducing rates of smoking-caused disease and death. These outcomes are a testament to the policy, legal, and clinical strategies begun 50 years ago that have reduced tobacco use and mitigated its harms.

The current landscape of tobacco use presents new challenges and opportunities. Nearly 50 million Americans continue to use

some form of tobacco, with much higher rates among the poor, the mentally ill, illicit-substance and alcohol abusers, Native Americans, and lesbian, gay, bisexual, and transgender persons. But research now quite clearly highlights the specific harms of combustible tobacco use (cigarette, pipe, and cigar smoking): given that up to 98% of tobacco-related deaths are attributable to combustible

products,<sup>1</sup> the net harms of these products, including harms from secondhand smoke, dwarf those of other forms of tobacco use (e.g., smokeless tobacco).<sup>2</sup>

Another feature of the emerging landscape is an increasing interest in harm reduction<sup>2</sup> and chronic care approaches<sup>3</sup> to reducing the dangers of tobacco use — strategies that can complement one another in a forward-looking approach to tobacco control but that also risk causing unintended consequences. Combustible tobacco is the chief killer among the various forms of tobacco, and a substantial population continues to smoke tobacco despite making repeated attempts to quit. Whether for genetic or constitutional reasons or owing

Maps showing lung-cancer mortality and smoking prevalence by state are available at NEJM.org

to environmental and behavioral challenges (e.g., poverty and stress), many smokers build an

extensive history of failed quit attempts. Despite producing substantial clinical benefit, current smoking-cessation treatments fail for the majority of smokers who use them, and they certainly don't help smokers who are unwilling to use them or the 70% of smokers who indicate at any given health care visit that they're unwilling to attempt to quit.

One opportunity afforded by today's changing landscape lies in the diverse alternative nicotine-delivery vehicles available to smokers. Evidence shows that all the noncombustible delivery vehicles are substantially less dangerous than combustible tobacco products, though that's not to say that they are all totally safe. Noncombustible forms include multiple nicotine-replacement therapies (NRTs) as well as smokeless tobacco (e.g., snus) and the electron-

ic cigarette (e-cigarette). Over the past few years, smokers have begun using e-cigarettes at a markedly increasing rate. More than 20% of smokers report having tried them, and some early evidence suggests that e-cigarette use may help smokers reduce or quit combustible tobacco use. There is currently too little evidence, however, to conclude with confidence that using e-cigarettes will aid smoking reduction or cessation, and there are important clinical concerns regarding their growing use. One such concern is that using e-cigarettes along with combustible cigarettes ("dual use") could prolong the use of combustibles.

How should clinicians respond to this changing landscape? Though only limited research is currently available to inform clinical decision making, we offer the following recommendations for clinical practice.

First, clinicians can tell patients that use of any tobacco product can be harmful but that combustible tobacco use is by far the most harmful. Second, they can strongly encourage patients who use tobacco to stop using any combustible or smokeless tobacco product. All such patients should be encouraged to quit, including those with serious mental health or active substance-abuse disorders. When patients are willing to try to quit, evidence-based cessation treatments (e.g., physician advice, quit-line counseling, and medications approved by the Food and Drug Administration [FDA]) should be provided.<sup>3</sup>

Third, smokers who are not willing to make a quit attempt can be urged to smoke combustibles as little as possible — and perhaps to use established strategies for reducing smoking, in-

cluding behavioral strategies such as refraining from smoking in their home or car.<sup>3</sup> In addition, clinicians can tell patients who smoke that using NRTs may help them reduce and ultimately end their combustible use<sup>3</sup>; there are many FDA-approved NRTs, including newer forms such as the nicotine mini-lozenge, that can quell the urge to smoke.

Fourth, during discussion of cigarette substitutes, many patients ask about e-cigarettes. Clinicians can take that opportunity to stress again that the main goal is to stop or reduce the use of combustibles — and to note that effects of long-term e-cigarette use are not known, but these devices are probably much safer than combustible tobacco products. Clinicians could tell patients, however, that if they use e-cigarettes, their health will improve only if their use helps them significantly reduce their use of combustible products and eventually stop combustible use entirely.

Finally, clinicians can monitor their patients' success in reducing combustible tobacco use over time and help them achieve cessation, either through direct assistance or through referral to a state tobacco quit line.

There are also public health policy actions that can help reduce the enormous health costs of combustible tobacco use. Although some experts see e-cigarettes as a means of achieving this aim, wide-scale promotion and use of e-cigarettes carries substantial public health risk.<sup>4</sup> One concern is that they will serve as a gateway product — that young people who first experiment with e-cigarettes will move on to using combustible tobacco. Another concern is that

normalization of e-cigarette use may lead former cigarette smokers to begin using this new product, thereby reinstating their nicotine dependence and fostering a return to combustible use. Smoke-free ordinances may also be undermined by e-cigarette use, and as noted above, dual use of e-cigarette and combustible products might prolong the use of combustibles.

Despite these concerns, the recognition of combustibles as the chief tobacco killer calls for a progressive public health approach that focuses on the known, overwhelming risks of these products. Specifically, we believe that evidence-based, population-wide policies should be implemented that particularly target reducing combustible tobacco use — for example, excise tax increases, state and national clean-indoor-air policies, and public-service media campaigns.

In addition, the promise of FDA regulation of tobacco use can be advanced markedly through a few key steps: implementation of graphic warning labels (that include the 1-800-QUIT NOW number) on all tobacco products; expansion of FDA jurisdiction, including advertising and marketing restrictions over all tobacco

products (including e-cigarettes and little cigars); and deployment of the legislated FDA authority to gradually reduce (to close to zero) the nicotine content of combustible tobacco products.

Children and adolescents should be protected from using any product containing tobacco or nicotine, including combustibles, e-cigarettes, and smokeless tobacco products. We believe such protections should include a ban on selling all such products to anyone under 21 years of age, given the risks for lifelong nicotine addiction associated with early use.

Furthermore, we need to communicate intelligently about harm reduction: not all nicotine-containing products are equal, and the public health focus should be on eliminating combustible tobacco products, even if some people who give up combustibles will continue using FDA-approved medications, e-cigarettes, or smokeless tobacco products indefinitely.

We can also significantly restrict the sale of all combustible tobacco products. For instance, sales could be restricted to very few outlets (e.g., only licensed vendors), and advertising and visible displays of combustible products at sale locations could be

prohibited. Alternatively, licenses could be required to purchase these products. Such restrictions, of course, would require new federal legislation.

New approaches must be adopted if we are to dramatically reduce the harms of tobacco use in the United States over the next decade. To achieve this goal requires that we recognize the unequaled dangers resulting from combustible tobacco use.

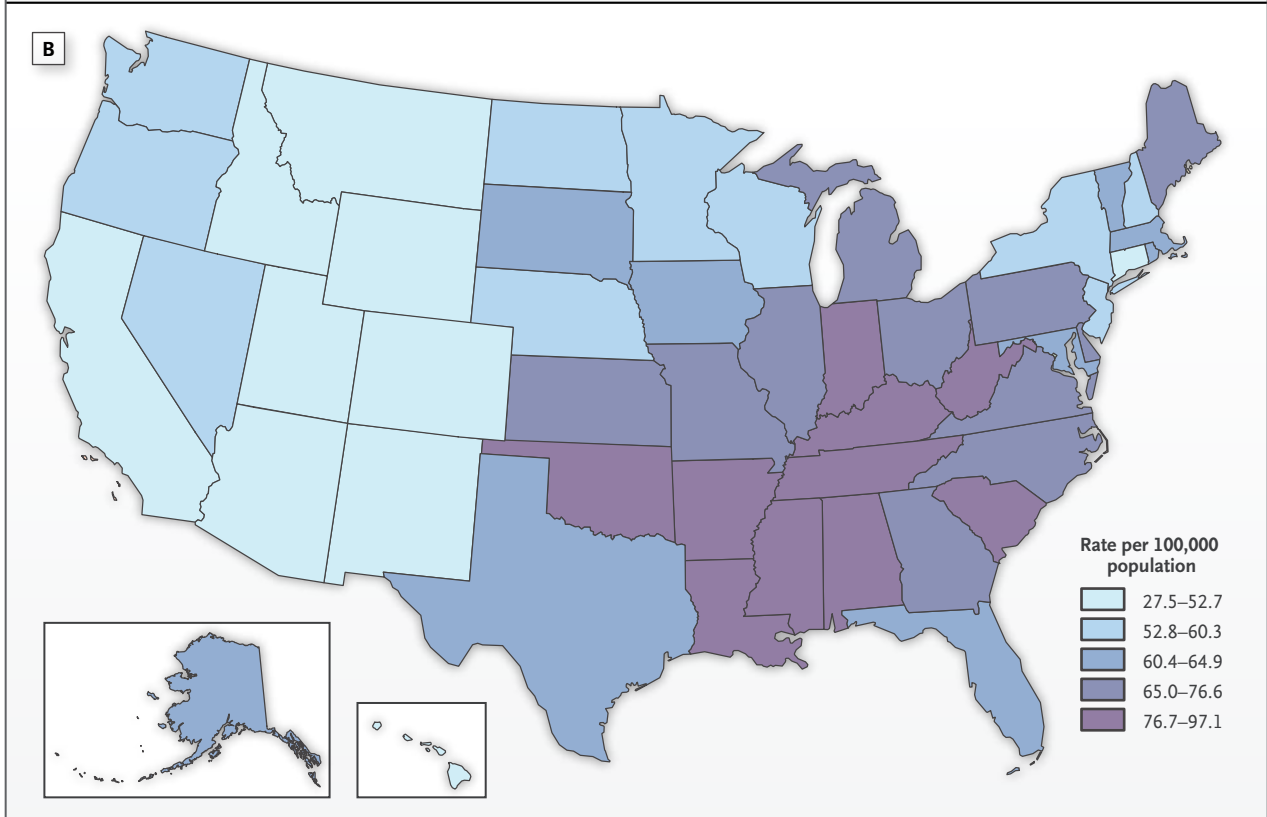
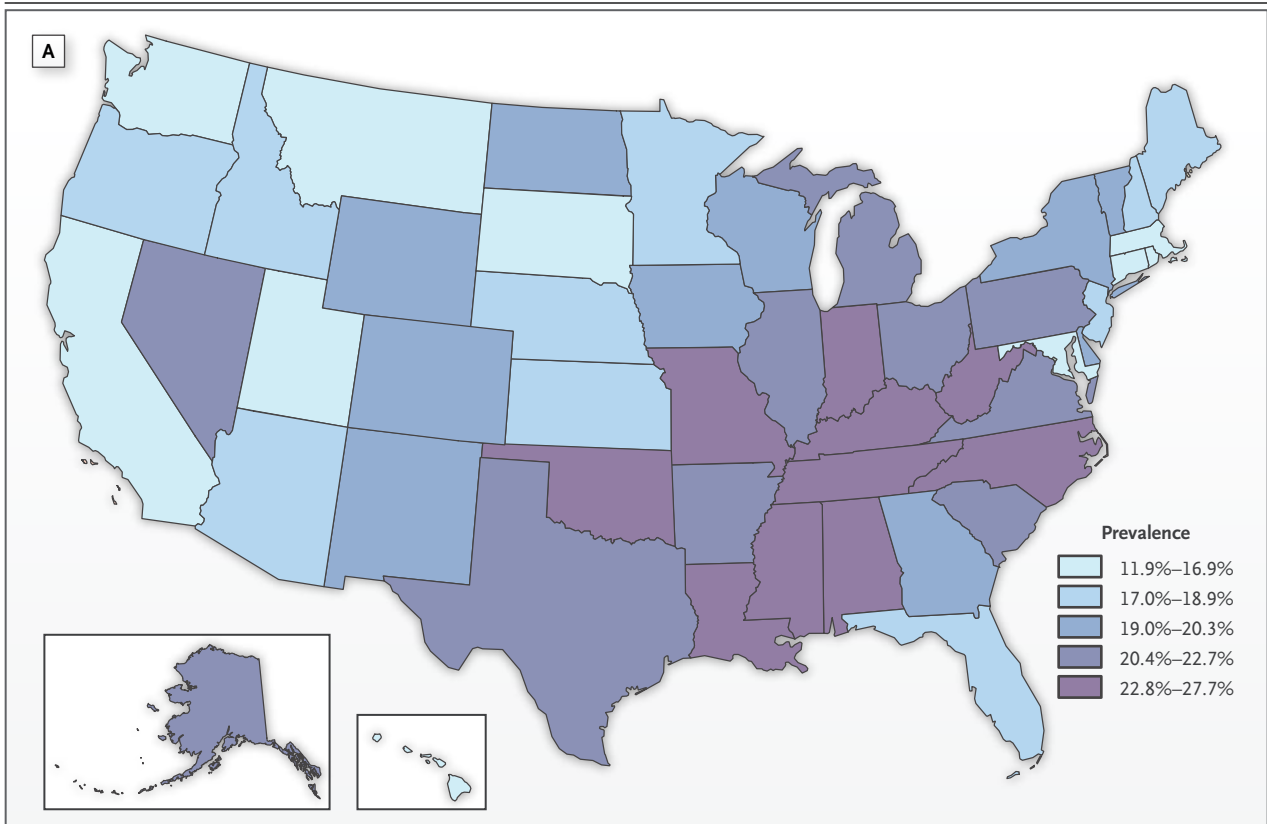
Disclosure forms provided by the authors are available with the full text of this article at NEJM.org.

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DOI: 10.1056/NEJMp1314942

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**Lung-Cancer Mortality among Male Americans, 2006–2010, and Smoking Prevalence among American Men 18 Years of Age or Older, 2009.**

In Panel A, rates are per 100,000 male Americans and are age-standardized to the 2000 U.S. standard population. Data are from the National Cancer Institute Surveillance, Epidemiology, and End Results Program ([www.seer.cancer.gov](http://www.seer.cancer.gov)) and the National Center for Health Statistics ([www.cdc.gov/nchs](http://www.cdc.gov/nchs)). Data in Panel B are from the Centers for Disease Control and Prevention ([www.cdc.gov/mmwr/preview/mmwrhtml/mm5943a2.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5943a2.htm)). Maps created with assistance from Ahmedin Jemal and Lindsey Torre, American Cancer Society.