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The San Francisco Ban and the Future of e-Cigarettes

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In June 2019, San Francisco became the first major US jurisdiction to ban the sale of electronic cigarettes. These devices, known by the catchall term "e-cigarettes," include a wide variety of electronic, battery-operated devices that vaporize (not burn) liquids to release nicotine and other substances, and that have levels of toxins that are lower than those from combustible tobacco products such as conventional cigarettes. Effective in early 2020, the measure allows the sale only of tobacco products that have undergone premarket review (no e-cigarettes have, to date) and received marketing authorization by the US Food and Drug Administration (FDA).

Over a decade, this "disruptive technology" has evolved to include highly engineered versions that are virtually indistinguishable from USB flash drives, are easily concealable, have appealing flavors, and use refillable cartridges that can contain nicotine levels equivalent to a pack of cigarettes. Intended to reverse the alarming rise in youth vaping, the San Francisco ban has sparked fierce debate about potential unintended consequences. The sudden emergence of acute vaping-associated lung illnesses involving (as of September 27) 46 states, more than 800 individuals, and at least 12 deaths has only deepened the debate. Initial investigations have identified a potential association between use of marijuana oils or concentrates in e-cigarettes and the occurrence of lipoid pneumonia.

The dominant e-cigarette maker, San Francisco-based Juul Labs—which is aggressively lobbying for a city ballot measure to block the San Francisco ban, arguing that it could fuel an e-cigarette black market—has rapidly grown in market share and is valued at $38 billion. Although e-cigarette makers have sought to distinguish themselves from traditional tobacco companies, the 2018 purchase by Altria (parent company of Philip Morris) of 35% of Juul fully blurs the distinction between the 2 companies. Indeed, all major tobacco companies worldwide now invest heavily in e-cigarettes.

Arguments For and Against the Ban

San Francisco's ban reflects the alarm of parents and policy makers about dramatic rises in adolescent e-cigarette use, now estimated to affect 3.6 million youths. From 2017 to 2018, the National Youth Tobacco Survey found that e-cigarette use among 12th-graders increased 78%; the Monitoring the Future Study (MTF) found an increase of 90% (from 11% to 20.9%) in this group. Among 10th- and 12th-graders, the absolute increases are the largest ever recorded for any substance in the MTF's 44-year history.

Supporters of the ban voice major concerns that e-cigarettes

- contain highly addictive nicotine, which poses risks to adolescent brain development that continue until about age 25 years
- are associated with increased risk of cigarette smoking
- have unknown long-term health effects.

Overall, advocates fear that the rise of e-cigarettes could reverse decades of tobacco denormalization that helped reduce 12th-grade daily cigarette smoking rates from 28.8% (in 1976) to 3.6% (in 2018).

Those opposing the ban, however, voice alarm that banning e-cigarettes incentivizes adult vapers to revert back to cigarettes. In the United States, where nearly two-thirds of adult smokers want to quit (2015), the ban, they argue, eliminates a lower-risk option, leaving on the market only combustible products, which produce 7000 chemicals (including 70 human carcinogens) and cause approximately 98% of all tobacco-related deaths. In the United Kingdom, where a national harm reduction and cessation strategy encourages substituting vaping for smoking, a recent randomized cessation trial of 886 smokers found e-cigarettes had an abstinence rate of 18% compared with 9.9% for standard nicotine replacement therapy (NRT)—although 80% of vapers still used e-cigarettes at 1-year follow-up.

Meanwhile, for adult smokers, a recent study notes that 25.2% of those trying to quit used e-cigarettes the prior year (2015). Among adult e-cigarette users in 2015, an estimated 29.8% were former regular cigarette smokers, whereas 58.8% continued smoking; such "dual use" for the latter group negates the potential health benefits of vaping.

These developments are playing out within a highly charged national regulatory milieu. The FDA gained regulatory control over cigarettes and smokeless tobacco with enactment of the Family Smoking Prevention and Tobacco Control Act (FSPTCA) in 2009, and then exercised regulatory discretion in 2016 to extend its jurisdiction to cover e-cigarettes and other tobacco products. In 2017, it proposed a broad regulatory

framework that recognized a continuum of risk among nicotine-containing products, placing approved NRT on one end, combustible tobacco products on the other, and e-cigarettes in between. The agency also proposed mandating the reduction of nicotine in combustible tobacco products to nonaddictive levels, a historic action with the potential to save tens of millions of lives in the United States. Although the FDA had also exercised "enforcement discretion" that delayed compulsory premarket review of new tobacco products, including e-cigarettes, a federal court recently ordered its implementation by May 2020, after a lawsuit by major health groups.

A Related Issue: Controversy Over Flavors

The FSPTCA also banned flavors (except menthol) in cigarettes in 2009 but allowed them in other tobacco products. In 2018, San Francisco, in another first-in-the nation policy, banned flavored tobacco products, including menthol, in conventional cigarettes. After more than 200 localities also imposed a variety of restrictions, Michigan became the first state to ban all flavored e-cigarettes under a temporary emergency order that is renewable, if necessary, after 6 months. The FDA has proposed banning menthol in cigarettes and all flavors in cigars. However, their more nuanced proposal for e-cigarettes to date has been to limit sales of certain "characterizing flavors" that clearly appeal to minors (such as grape, bubble gum, and cotton candy) while allowing continued availability of mint and menthol flavors used by adults.

In late 2018, Juul stopped selling flavored pods (except mint, menthol, and tobacco flavors) in stores, restricted online sales to consumers aged 21 years and older, and shuttered their Facebook and Instagram channels. Notably, their proposed ballot initiative threatens to reverse not only San Francisco's e-cigarette ban but potentially also its flavor ban.

The Bull's-Eye: Ending Smoking

Whether San Francisco's unprecedented experiment ultimately succeeds will hinge on eliminating underage vaping without increasing adult cigarette smoking. Understanding and solving the recent wave of vaping-related lung illness is also of paramount concern.

As part of such efforts, the FDA should review the plethora of e-cigarettes on the market and implement regulations to reverse the youth epidemic, starting with a ban (like Michigan's) on flavored products that have not undergone premarket review and received marketing authorization by the agency. Against this dynamic backdrop, the nation must also stay focused on the public health bull's-eye: ending smoking by maximizing proven evidence-based interventions, such as coverage for FDA-approved cessation medications and counseling, taxation, clean indoor air policies, raising the minimum age of sale to 21, and countermarketing. e-Cigarette policy should ensure product safety, prevent youth initiation, and advance the overall goal of eliminating combustible tobacco use.

The FSPTCA directs the FDA to regulate tobacco products through a public health standard that saves the most lives. How the San Francisco ban and related policy interventions can best uphold this standard will inform how quickly society can reach a healthier future, free from preventable tobacco-related illness. ■

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