

Centers for Disease Control and Prevention, Office on Smoking and Health
Summary of Scientific Evidence:
Raising the Minimum Legal Sales Age for Tobacco Products
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The Public Health Burden of Tobacco Product Use

- The burden of disease and death from tobacco product use in the United States is overwhelmingly caused by cigarettes and other combustible tobacco products.¹
 - Every year in the United States, approximately 480,000 deaths and over \$300 billion in healthcare and lost productivity costs are attributable to cigarette smoking.^{2,3}
 - For every person who dies from smoking in the United States, at least 30 people live with a serious smoking-related illness.⁴
 - Worldwide, tobacco product use and secondhand smoke exposure cause over 8 million deaths per year.⁵
 - Cigarette smoking causes diseases of almost every organ of the human body, including cancer, stroke, Type 2 diabetes, and chronic obstructive pulmonary disease (COPD).⁶ Smoking causes cancer of the lung, esophagus, larynx, mouth, throat, kidney, bladder, liver, pancreas, stomach, cervix, colon, and rectum.^{7,8,9}
 - Even occasional or intermittent cigarette smoking still causes considerable harm.¹⁰ Occasional or intermittent smoking is associated with increased risk for cardiovascular disease, lung and other cancers, and lower respiratory tract infections.^{11,12}
- No tobacco product is harmless.
 - Smokeless tobacco product use causes cancers of the mouth, esophagus, and pancreas; is associated with diseases of the mouth; and may increase the risk for death from heart disease and stroke.^{13,14,15}
 - Additional research is still needed regarding the health effects of using e-cigarettes and other emerging tobacco products, such as heated tobacco products. However, the current evidence shows that the aerosol that e-cigarette users breathe from the device and exhale can contain harmful and potentially harmful substances, including heavy metals like lead, volatile organic compounds, and cancer-causing agents.¹⁶
 - Studies of secondhand emissions from heated tobacco products suggest that the products expose both users and bystanders to some of the same chemicals found in cigarette smoke, although at lower levels than cigarette smoke.¹⁷
- Nicotine is a highly addictive drug found in tobacco products.¹⁸
 - As with drugs such as cocaine and heroin, nicotine activates the brain's reward circuits and reinforces repeated nicotine exposure.¹⁹
 - Nicotine also increases the risk of cardiovascular, respiratory, and gastrointestinal disorders; decreases immune response; negatively impacts reproductive health; has acute toxicity at high-enough doses; and increases the risk for the development of smoking-related disease.^{20,21,22}
- Nicotine is a health danger for pregnant women and their developing babies.²³
- Youth and young adults are especially vulnerable to the harmful effects of nicotine.^{24,25}



- Nicotine exposure can harm the developing brain, which continues to develop into the mid-20s. Specifically, using nicotine in adolescence and young adulthood can harm the prefrontal cortex, or the part of the brain that controls attention, learning, mood, and impulse control.²⁶
- Each time a new memory is created or a new skill is learned, stronger connections – or synapses – are built between brain cells. Young people’s brains build synapses faster than adult brains. Nicotine changes the way these synapses are formed.²⁷
- The findings of a recent study suggest that starting smoking regularly at age 18 to 20 was associated with higher odds of nicotine dependence and lower odds of smoking cessation than starting at age 21 or older.²⁸
- Using nicotine in adolescence and young adulthood may also increase risk for future addiction to other drugs.²⁹

The Problem of Tobacco Product Use Initiation

- Almost all smokers begin smoking as youth or young adults, and focusing on preventing youth and young adult initiation is a critical component to addressing the tobacco epidemic.³⁰
- The U.S. Surgeon General has reported that “earlier age of onset of smoking marks the beginning of the exposure to the many harmful components of smoking. This is during an age range when growth is not complete and susceptibility to the damaging effects of tobacco smoke may be enhanced.”³¹
- In addition, an earlier age of initiation extends the potential duration of smoking throughout the lifespan. For the major chronic diseases caused by smoking, the epidemiologic evidence indicates that risk rises progressively with increasing duration of smoking; indeed, for lung cancer, the risk rises more steeply with the duration of smoking than with the number of cigarettes smoked per day.^{32,33}
- According to the Surgeon General, “if smoking persists at the current rate among young adults in this country, 5.6 million of today’s Americans younger than 18 years of age are projected to die prematurely from a smoking-related illness.”³⁴
- Each day in the United States, about 1,600 youth under age 18 try their first cigarette.³⁵ Nearly 9 out of 10 adult cigarette smokers who smoke daily first try smoking by age 18,³⁶ and 99% first try smoking by age 26.³⁷ Therefore, after age 25, almost no smokers began smoking or transitioned to daily smoking.³⁸

Youth and Young Adults’ Current Use of Tobacco Products

- It is important to consider how younger populations use tobacco products when addressing youth and young adult initiation.
 - The use of multiple tobacco products is quite common among youth and young adults.³⁹ Youth may be switching between products for a number of different reasons, including pricing, marketing, or other factors.⁴⁰
 - However, switching between combusted tobacco products such as cigarettes and cigars, continuing to smoke while using non-combusted products such as smokeless tobacco or e-cigarettes, or cutting down smoking does not meaningfully reduce the health risks associated with tobacco product use.^{41,42} The only way to fully reduce the health risks associated with smoking is to quit smoking completely.⁴³ The use of any tobacco product—including e-cigarettes—is unsafe for youth and young adults.⁴⁴

- Since 2011, the United States has seen declines in youth use of combustible tobacco products.^{45,46} In 2020, however, 1.6% of middle school students and 4.6% of high school students reported current (past 30 day) use of cigarettes and 1.5% of middle school students and 5.0% of high school students reported current use of cigars.^{47,48}
- Although considerable progress has been made in reducing cigarette smoking among U.S. adults and youth,⁴⁹ the tobacco product landscape continues to evolve to include a variety of tobacco products, including smoked, smokeless, and electronic products, such as e-cigarettes.⁵⁰
- E-cigarettes have been the most commonly used tobacco product among U.S. youth since 2014.⁵¹
 - In 2020, 19.6% of U.S. high school students and 4.7% of U.S. middle school students – a total of 3.6 million youth – reported current use (use in the past 30 days) of e-cigarettes.⁵² Among these students reporting current use of e-cigarettes, more than 1 in 5 high school students and nearly 1 in 10 middle school students reported using these products daily.⁵³
 - In recent years, patterns of e-cigarette use have driven patterns of overall tobacco product use among U.S. youth.⁵⁴ E-cigarettes may expose a new generation of young people to nicotine addiction and might lead to sustained tobacco use.^{55,56,57}
 - E-cigarette use is higher among younger adults than older adults; in 2018, current e-cigarette use was 7.6% among adults aged 18-24, compared to 4.3% among those aged 25-44, 2.1% among those aged 45-64, and 0.8% among those aged 65 years or older.⁵⁸

Youth Vulnerability to Tobacco Marketing

- Adolescents are highly vulnerable to tobacco industry marketing, smoking imagery in movies, and peer influence, and are not able to fully appreciate the health risks they face in the future.⁵⁹
- Furthermore, the tobacco industry has also explicitly targeted youth and young adults.⁶⁰
 - Internal tobacco industry documents emphasize the industry's desire to increase consumption within these target markets in order to obtain "replacement smokers," and thus, remain profitable.^{61,62}
 - In 2006, U.S. District Court Judge Gladys Kessler concluded that, regarding the tobacco industry's marketing practices, "from the 1950s to the present, different defendants, at different times and using different methods, have intentionally marketed to young people under the age of twenty-one in order to recruit 'replacement smokers' to ensure the economic future of the tobacco industry."⁶³
 - In 2014, the Surgeon General stated that "the root cause of the smoking epidemic is also evident: the tobacco industry aggressively markets and promotes lethal and addictive products, and continues to recruit youth and young adults as new consumers of these products."⁶⁴
 - In 2016, the U.S. Surgeon General concluded that e-cigarettes are marketed by promoting flavors and using a wide variety of media channels and approaches that have been used in the past for marketing conventional tobacco products to youth and young adults.⁶⁵

Potential Public Health Impact of Raising the Minimum Legal Sales Age

- A robust strategy that combines strategies with a well-established evidence base, such as comprehensive smoke-free laws and pricing strategies, as well as newer strategies such as laws raising the minimum legal sales age (MLSA) to 21 years, can help prevent and reduce tobacco product use among U.S. youth.^{66,67}
- In March 2015, the Institute of Medicine (now known as the National Academy of Medicine) issued a report, *Public Health Implications of Raising the Minimum Age of Legal Access to Tobacco Products*. The report was compiled by a committee of experts in the epidemiology of tobacco product use and tobacco product risks, adolescent and young adult development, risk behaviors and perceptions, public policy modeling, and public health policy, law, and practice. The report modeled the likely public health outcomes of raising the MLSA to 19 years, 21 years, and 25 years, taking into consideration the developmental stages during which adolescents and young adults are more vulnerable to the adverse effects of nicotine.⁶⁸
 - The Institute of Medicine report found that, overall, increasing the MLSA will likely prevent or delay initiation of tobacco use by adolescents and young adults, and that the age group most impacted by this prevention and delay of initiation will be those age 15 to 17 years.
 - The report also concluded that raising the MLSA would likely lead to substantial reductions in smoking prevalence as well as in smoking-related mortality.⁶⁹
 - Specifically, the report predicted that, over time, adult cigarette smoking prevalence would decline by about 12% and smoking-related deaths would decline by over 10% if the MLSA for tobacco products were raised to 21.⁷⁰ The report also predicted that, over that same timeframe, adult smoking prevalence would decline by nearly 16% and smoking-related deaths would decline by over 14% if the MLSA for tobacco products were raised to 25.⁷¹
- A more recent study examined the potential impact of raising the MLSA to 21 years on young adults who are likely to smoke.
 - Specifically, it estimated that raising the MLSA to 21 years would reduce the odds of cigarette smoking by 39% among 18- to 20-year-olds who had ever tried smoking or using an e-cigarette.⁷²
 - It also found that, among 18- to 20-year-olds who had close friends who smoked or used e-cigarettes at age 16, raising the MLSA to 21 would decrease their odds of becoming established smokers by 46%.⁷³ Thus, it is expected that this policy would have a magnified effect among young people who have peers who smoke or use e-cigarettes.
- A comprehensive strategy to prevent youth smoking includes restricting the supply of cigarettes to minors, which includes both commercial (e.g., from stores or vending machines) and social supply chains (e.g., borrowing, buying, or stealing from other youth or adults).^{74,75}
 - Addressing the commercial supply requires taking appropriate steps to prevent illegal sales in the retail environment; educating merchants, youth, and young adults; and actively enforcing MLSA laws.^{76,77,78,79}
 - However, raising the MLSA could also help eliminate the social supply—especially in high schools, where 18-year-old seniors are often a supply source for tobacco products for their younger counterparts.⁸⁰ Older youth are also more likely to succeed in purchasing tobacco products and, thus, raising the MLSA to 21 years could reduce the likelihood that youth can access tobacco products and provide them to younger peers.⁸¹

- A recent study also modeled how raising the MLSA for tobacco products to 21 years of age would impact national retail tobacco sales.⁸²
 - The study found that if such a policy were implemented nationwide, the maximum immediate loss of sales would be just 2% of the total cigarette sales in the United States.⁸³ As the lower tobacco-use cohort aged, small businesses would be able to adjust to the resulting changed market conditions.⁸⁴
 - Furthermore, the study noted that retailers are already required under federal rules to check the ID of anyone who appears to be younger than 27 years seeking to purchase tobacco, so an age 21 requirement would place no additional compliance burden on retail staff.⁸⁵ The researchers concluded that, overall, the potential of this approach to reduce smoking and prevent disease outweighs the temporary cost of lost sales.⁸⁶
- In addition, setting the MLSA for tobacco products to 21 years will harmonize tobacco and alcohol sales, which would streamline enforcement.⁸⁷
- In addition to enforcement considerations, the science related to alcohol is also available for consideration in the context of MLSA. For example, overall, the scientific literature related to alcohol indicates that higher minimum legal sales ages improve health outcomes—especially in preventing youth and young adult use.⁸⁸
- Specifically, the Task Force on Community Preventive Services recommends implementing and maintaining an age 21 minimum legal drinking age based on strong evidence of their effectiveness.⁸⁹ Evidence indicates that age 21 minimum legal drinking age laws result in lower levels of alcohol consumption—both among young adults 21 years of age and older, as well as those less than 21 years of age— and reduce alcohol-attributable harms, including motor vehicle crashes.⁹⁰ The Task Force also recommends enhanced enforcement of these laws.⁹¹

What States and Localities Have Done

- On December 20, 2019, the Federal Food, Drug, and Cosmetic Act was amended to raise the federal MLSA for tobacco products from 18 to 21 years. This legislation became effective immediately and made it illegal for a retailer to sell any tobacco product - including cigarettes, cigars, and e-cigarettes - to anyone under 21 years.⁹²
- The new federal MLSA applies to all retail establishments and persons with no exceptions. It applies to retailers in all states, the District of Columbia (D.C.), five U.S. territories, and on tribal lands.⁹³
- Prior to this change in federal law, 19 states, 2 territories (Guam and Palau), and D.C. had already enacted legislation raising their MLSA for tobacco products to 21 years.⁹⁴ At least 540 localities had also raised their MLSA to 21 years, with the first such policy being implemented in 2005.^{95,96}
- Jurisdictions can enforce their MLSA laws and impose penalties for violations of those laws. If a jurisdiction's laws are not as strong as the federal MLSA law, however, retailers still must comply with the federal law.^{97,98}
- There is no mandate that states, localities, and territories increase their MLSA to 21 years to conform to federal law.^{99,100} However, many states have done so to enable them to receive federal grants to address substance use, which are conditioned on prohibiting tobacco product sales to underage persons.^{101,102}

- In addition, many states have also raised their MLSA to complement federal enforcement activities with respect to the new federal prohibition on sales to individuals who are between 18 and 20 years old, because federal enforcement agents do not do compliance checks in every store each year.^{103,104,105}
- As of December 31, 2020, an additional ten states have raised their MLSA for tobacco products to 21 years.¹⁰⁶
- The federal MLSA law does not preclude state, local, tribal, or territorial laws that further restrict the sale of tobacco products; jurisdictions can enact sales prohibitions that are more restrictive than the federal law, including raising the MLSA for tobacco products above 21 years.^{107,108}
- The specific impact of recently enacted local policies that raise the MLSA for tobacco products is still being evaluated. However, there are some initial data supporting the earlier studies that projected declines in tobacco product use.
 - In 2005, Needham, Massachusetts, was the first town in the country to raise the MLSA to 21 years.¹⁰⁹ Surveillance data reveal a 47% reduction in the Needham high-school smoking rate over four years after implementation, likely attributable, in part, to this local policy approach.¹¹⁰
 - In 2015, Hawaii became the first state to raise the MLSA for tobacco to 21.¹¹¹ After Hawaii raised its MLSA to 21, it observed a sales decrease in cigarettes, cigars, and cigarillos.¹¹² An evaluation of its policy also suggested that it may help to reduce sales of cigarette and large cigar products most preferred by U.S. youth and young adults.¹¹³
 - Another evaluation of both Hawaii's and California's MLSA laws suggested that cigarette sales declined by about 18% and 13%, respectively, when compared to states that did not raise their MLSAs, indicating that these types of laws may reduce tobacco product sales and consumption.¹¹⁴
 - Oregon raised its MLSA to 21 years effective January 1, 2018. An evaluation of the law, which consisted of cross-sectional surveys of youth and young adults before and after the law, found that initiation of tobacco product use decreased significantly among tobacco users aged 13-17 years (from 34% to 25%) and aged 18-20 years (from 23%-18%) following the law's implementation.¹¹⁵
 - A study of cigarette sales in select U.S. cities suggested that MLSAs of 21 years likely reduced sales of brands popular with young people under the age of 21.¹¹⁶
 - A study of smoking prevalence among 18- to 20-year old people living in urban areas throughout the United States suggested that local laws setting an MLSA of 21 years reduced smoking prevalence among people in this age group.¹¹⁷

Public Support for Increasing the Minimum Legal Sales Age

- Studies indicate broad support among U.S. adults for increasing the MLSA.
- Generally, approximately three-quarters of U.S. adults favor raising the minimum tobacco age of sale to 21 years of age.^{118,119} This includes seven out of ten adult cigarette smokers.¹²⁰
- Additionally, a recent evaluation of the California law suggests that high awareness and support for the law may have contributed to reducing illegal tobacco sales to young people and achieving widespread retailer knowledge of, and conformity with, the new law.¹²¹

Summary

- Given that almost all adult daily smokers first start smoking before the age of 26, preventing youth and young adults from trying their first tobacco products, and reducing the number of youth and young adults that transition to become regular, daily tobacco product users into adulthood, are two key components to ending the tobacco epidemic.
- Youth and young adults are especially vulnerable to the deadly chemicals in tobacco, nicotine dependence and addiction, and the heavy marketing used to sell tobacco products, including e-cigarettes.
- An emerging body of scientific evidence suggests that raising the MLSA for tobacco products appears to be a promising and important component of a comprehensive approach to tobacco prevention and control. It also has the shorter-term benefit of reducing young people's exposure to the harmful, addictive effects of nicotine—especially during this vulnerable period of brain development.

References

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- ¹ U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ² U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ³ Xu X, Bishop EE, Kennedy SM, Simpson SA, Pechacek TF. Annual healthcare spending attributable to cigarette smoking: an update. *Am J Prev Med*. 2015;48(3):326-333.
- ⁴ U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ⁵ World Health Organization. *WHO Report on the Global Tobacco Epidemic, 2017*. World Health Organization, 2017.
- ⁶ U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ⁷ U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ⁸ U.S. Department of Health and Human Services. *How Tobacco Smoke Causes Disease: The Biology and Behavioral Basis for Smoking-Attributable Disease: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2010.
- ⁹ U.S. Department of Health and Human Services. *The Health Consequences of Smoking: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2004.
- ¹⁰ Schane RE, Ling PM, Glantz SA. Health effects of light and intermittent smoking: a review. *Circulation* 2010;121(13):1518-22.
- ¹¹ Schane RE, Ling PM, Glantz SA. Health effects of light and intermittent smoking: a review. *Circulation* 2010;121(13):1518-22.
- ¹² Inoue-Choi M, Christensen CH, Rostron BL, et al. Dose-response association of low-intensity and nondaily smoking with mortality in the United States. *JAMA Netw Open*. 2020;3(6):e206436.
- ¹³ World Health Organization. [*IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. Volume 89: Smokeless Tobacco and Some Tobacco-Specific N-Nitrosamines*](#). World Health Organization, International Agency for Research on Cancer, 2007.
- ¹⁴ U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of*

-
- the Surgeon General. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ¹⁵ Piano MR, Benowitz NL, Fitzgerald GA, Corbridge S, Heath J, Hahn E, et al. Impact of smokeless tobacco products on cardiovascular disease: implications for policy, prevention, and treatment: A policy statement from the American Heart Association. *Circulation* 2010;122(15):1520–44.
- ¹⁶ U.S. Department of Health and Human Services. *E-cigarette Use Among Youth and Young Adults: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2016.
- ¹⁷ Simonavicius E, McNeill A, Shahab L, et al. Heat-not-burn tobacco products: a systematic literature review. *Tob Control* 2019;28:582–94.
- ¹⁸ U.S. Department of Health and Human Services. *E-cigarette Use Among Youth and Young Adults: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2016.
- ¹⁹ U.S. Department of Health and Human Services. *E-cigarette Use Among Youth and Young Adults: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2016.
- ²⁰ U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ²¹ Mishra A, Chaturvedi P, Datta S, Sinukumar S, Joshi P, Garg A. Harmful effects of nicotine. *Indian J Med Paediatr Oncol*. 2015;36(1):24–31.
- ²² U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ²³ U.S. Department of Health and Human Services. *E-cigarette Use Among Youth and Young Adults: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2016.
- ²⁴ U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ²⁵ U.S. Department of Health and Human Services. *E-cigarette Use Among Youth and Young Adults: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2016.
- ²⁶ U.S. Department of Health and Human Services. *E-cigarette Use Among Youth and Young Adults: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2016.
- ²⁷ U.S. Department of Health and Human Services. *E-cigarette Use Among Youth and Young Adults: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2016.
- ²⁸ Ali FRM, Agaku IT, Sharapova SR, Reimels EA, Homa DM. Onset of regular smoking before age 21 and subsequent nicotine dependence and cessation behavior among US adult smokers. *Prev Chronic Dis* 2020;17:E06. doi: <http://dx.doi.org/10.5888/pcd17.190176>
- ²⁹ U.S. Department of Health and Human Services. *E-cigarette Use Among Youth and Young Adults: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2016.
- ³⁰ U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ³¹ U.S. Department of Health and Human Services. *Preventing Tobacco Use Among Youth and Young Adults: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2012.
- ³² U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ³³ U.S. Department of Health and Human Services. *Preventing Tobacco Use Among Youth and Young Adults: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention,

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- National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2012.
- ³⁴ U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ³⁵ Substance Abuse and Mental Health Services Administration. *2018 National Survey on Drug Use and Health*. Annual Detailed Tables. Substance Abuse and Mental Health Data Archive. Available at: <http://www.samhsa.gov/data/report/2018-nsduh-annual-national-report>
- ³⁶ U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ³⁷ U.S. Department of Health and Human Services. *Preventing Tobacco Use Among Youth and Young Adults: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2012.
- ³⁸ U.S. Department of Health and Human Services. *Preventing Tobacco Use Among Youth and Young Adults: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2012.
- ³⁹ U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ⁴⁰ U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ⁴¹ U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ⁴² Goniewicz ML, Smith DM, Edwards KC, et al. Comparison of nicotine and toxicant exposure in users of electronic cigarettes and combustible cigarettes. *JAMA Netw Open*. 2018;1(8):e185937.
- ⁴³ U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ⁴⁴ U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ⁴⁵ Gentzke AS, Creamer M, Cullen KA, et al. Vital signs: tobacco product use among middle and high school students—United States, 2011–2018. *MMWR Morb Mortal Wkly Rep*. 2019;68:157-64.
- ⁴⁶ U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ⁴⁷ Gentzke AS, Creamer M, Cullen KA, et al. Vital signs: tobacco product use among middle and high school students—United States, 2011–2018. *MMWR Morb Mortal Wkly Rep*. 2019;68:157-64.
- ⁴⁸ Gentzke AS, Wang TW, Jamal A, et al. Vital signs: tobacco product use among middle and high school students — United States, 2020. *MMWR Morb Mortal Wkly Rep*. 2020;69:1881-88.
- ⁴⁹ U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ⁵⁰ U.S. Department of Health and Human Services. *E-cigarette Use Among Youth and Young Adults: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2016.
- ⁵¹ Gentzke AS, Creamer M, Cullen KA, et al. Vital signs: tobacco product use among middle and high school students—United States, 2011–2018. *MMWR Morb Mortal Wkly Rep*. 2019;68:157-64.
- ⁵² Wang TW, Neff LJ, Park-Lee E, Ren C, Cullen KA, King BA. E-cigarette use among middle and high school students — United States, 2020. *MMWR Morb Mortal Wkly Rep*. 2020;69(37):1310-12. doi: <http://dx.doi.org/10.15585/mmwr.mm6937e1>
- ⁵³ Wang TW, Neff LJ, Park-Lee E, Ren C, Cullen KA, King BA. E-cigarette use among middle and high school students — United States, 2020. *MMWR Morb Mortal Wkly Rep*. 2020;69(37):1310-12. doi: <http://dx.doi.org/10.15585/mmwr.mm6937e1>

-
- ⁵⁴ Gentzke AS, Creamer M, Cullen KA, et al. Vital signs: tobacco product use among middle and high school students—United States, 2011–2018. *MMWR Morb Mortal Wkly Rep*. 2019;68:157-64.
- ⁵⁵ U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ⁵⁶ U.S. Department of Health and Human Services. *E-cigarette Use Among Youth and Young Adults: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2016.
- ⁵⁷ U.S. Department of Health and Human Services. *Surgeon General's Advisory on E-cigarette Use Among Youth*, 2018. Available at: <https://e-cigarettes.surgeongeneral.gov/documents/surgeon-generals-advisory-on-e-cigarette-use-among-youth-2018.pdf>
- ⁵⁸ Creamer MR, Wang TW, Babb S, et al. Tobacco product use and cessation indicators among adults — United States, 2018. *MMWR Morb Mortal Wkly Rep*. 2019;68:1013-19.
- ⁵⁹ U.S. Department of Health and Human Services. *Preventing Tobacco Use Among Youth and Young Adults: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2012.
- ⁶⁰ U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ⁶¹ U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ⁶² U.S. Department of Health and Human Services. *Preventing Tobacco Use Among Youth and Young Adults: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2012.
- ⁶³ *U.S. v. Phillip Morris USA, Inc., et al.* No 99-CV-02496GK (U.S. Dist. Ct., D.C.), Final Opinion, p. 972, August 17, 2006.
- ⁶⁴ U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ⁶⁵ U.S. Department of Health and Human Services. *E-cigarette Use Among Youth and Young Adults: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2016.
- ⁶⁶ U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ⁶⁷ Institute of Medicine. *Public Health Implications of Raising the Minimum Age of Legal Access to Tobacco Products*. National Academies Press, 2015.
- ⁶⁸ Institute of Medicine. *Public Health Implications of Raising the Minimum Age of Legal Access to Tobacco Products*. National Academies Press, 2015.
- ⁶⁹ Institute of Medicine. *Public Health Implications of Raising the Minimum Age of Legal Access to Tobacco Products*. National Academies Press, 2015.
- ⁷⁰ Institute of Medicine. *Public Health Implications of Raising the Minimum Age of Legal Access to Tobacco Products*. National Academies Press, 2015.
- ⁷¹ Institute of Medicine. *Public Health Implications of Raising the Minimum Age of Legal Access to Tobacco Products*. National Academies Press, 2015.
- ⁷² Friedman AS, Buckell J, Sindelar JL. Tobacco-21 laws and young adult smoking: quasi-experimental evidence. *Addiction* 2019;114:1816-23. doi: <https://doi.org/10.1111/add.14653>
- ⁷³ Friedman AS, Buckell J, Sindelar JL. Tobacco-21 laws and young adult smoking: quasi-experimental evidence. *Addiction* 2019;114:1816-23. doi: <https://doi.org/10.1111/add.14653>
- ⁷⁴ U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ⁷⁵ U.S. Department of Health and Human Services. *Preventing Tobacco Use Among Youth and Young Adults: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2012.
- ⁷⁶ U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A*

- Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
- ⁷⁷ U.S. Department of Health and Human Services. *Preventing Tobacco Use Among Youth and Young Adults: A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2012.
- ⁷⁸ Dai H, Chaney L, Ellerbeck E, Friggeri R, White N, Catley D. Youth knowledge of Tobacco 21 and its association with intention to use tobacco. *Nicotine & Tob Research* 2021;23(2):341-48. doi: <https://doi.org/10.1093/ntr/ntaa149>
- ⁷⁹ Levinson AH, Lee JGL, Jason LA, DiFranza JR. Asking for identification and retail tobacco sales to minors. *Pediatrics* 2020;145(5):e20193253. doi: <https://doi.org/10.1542/peds.2019-3253>
- ⁸⁰ DiFranza JR, Coleman M. Sources of tobacco for youths in communities with strong enforcement of youth access laws. *Tob Control* 2001;10(4):323-28.
- ⁸¹ DiFranza JR, Coleman M. Sources of tobacco for youths in communities with strong enforcement of youth access laws. *Tob Control* 2001;10(4):323-28.
- ⁸² Winickoff JP, Hartman L, Minghua L, Chen ML, Gottlieb M, Nabi-Burza E, DiFranza JR. Retail impact of raising tobacco sales age to 21 years. *Am J Public Health* 2014;104(11):e18-e21. doi: [10.2105/AJPH.2014.302174](https://doi.org/10.2105/AJPH.2014.302174)
- ⁸³ Winickoff JP, Hartman L, Minghua L, Chen ML, Gottlieb M, Nabi-Burza E, DiFranza JR. Retail impact of raising tobacco sales age to 21 years. *Am J Public Health* 2014;104(11):e18-e21. doi: [10.2105/AJPH.2014.302174](https://doi.org/10.2105/AJPH.2014.302174)
- ⁸⁴ Winickoff JP, Hartman L, Minghua L, Chen ML, Gottlieb M, Nabi-Burza E, DiFranza JR. Retail impact of raising tobacco sales age to 21 years. *Am J Public Health* 2014;104(11):e18-e21. doi: [10.2105/AJPH.2014.302174](https://doi.org/10.2105/AJPH.2014.302174)
- ⁸⁵ Winickoff JP, Hartman L, Minghua L, Chen ML, Gottlieb M, Nabi-Burza E, DiFranza JR. Retail impact of raising tobacco sales age to 21 years. *Am J Public Health* 2014;104(11):e18-e21. doi: [10.2105/AJPH.2014.302174](https://doi.org/10.2105/AJPH.2014.302174)
- ⁸⁶ Winickoff JP, Hartman L, Minghua L, Chen ML, Gottlieb M, Nabi-Burza E, DiFranza JR. Retail impact of raising tobacco sales age to 21 years. *Am J Public Health* 2014;104(11):e18-e21. doi: [10.2105/AJPH.2014.302174](https://doi.org/10.2105/AJPH.2014.302174)
- ⁸⁷ Winickoff JP, McMillen R, Tanski S, et al. Public support for raising the age of sale for tobacco to 21 in the United States. *Tob Control* 2016;25(3):284-88.
- ⁸⁸ Centers for Disease Control and Prevention. *Age 21 Minimum Legal Drinking Age Fact Sheet*. Accessed October 19, 2020. Available at: <http://www.cdc.gov/alcohol/fact-sheets/mla.htm>
- ⁸⁹ Shults RA, Elder RW, Sleet DA, et al. Reviews of evidence regarding interventions to reduce alcohol-impaired driving. *Am J Prev Med*. 2001;21(4S):66-8.
- ⁹⁰ O'Malley PM, Wagenaar AC. Effects of minimum drinking age laws on alcohol use, related behaviors, and traffic crash involvement among American youth: 1976-1987. *J Stud Alcohol and Drugs* 1991;52:478-91.
- ⁹¹ Elder RW, Lawrence B, Janes G, Brewer RD, Tommey TL, Hingson RW, Naimi TS, Wing SG, Fielding J. Enhanced enforcement of laws prohibiting sale of alcohol to minors: systematic review of effectiveness for reducing sales and underage drinking. *Transportation Research Circular*. E-C123. 2007;E-C123:181-88. Available at: <http://www.trb.org/Publications/Blurbs/159420.aspx>
- ⁹² U.S. Food & Drug Administration. *Tobacco 21*. Accessed January 29, 2021. <https://www.fda.gov/tobacco-products/retail-sales-tobacco-products/tobacco-21>
- ⁹³ U.S. Food & Drug Administration. *Tobacco 21*. Accessed January 29, 2021. <https://www.fda.gov/tobacco-products/retail-sales-tobacco-products/tobacco-21>
- ⁹⁴ CDC State Tobacco Activities Tracking and Evaluation (STATE) System. *CDC STATE System Tobacco Legislation – Youth Access*. Accessed October 19, 2020. <https://www.cdc.gov/STATESystem/>
- ⁹⁵ Campaign for Tobacco-Free Kids. *States and Localities That Have Raised the Minimum Legal Sale Age for Tobacco Products to 21*. Accessed December 9, 2020. https://www.tobaccofreekids.org/assets/content/what_we_do/state_local_issues/sales_21/states_localities_MLSA_21.pdf
- ⁹⁶ Winickoff JP, Hartman L, Minghua LL, Chen ML, Gottlieb M, Nabi-Burza E, DiFranza JR. Retail impact of raising tobacco sales age to 21 years. *Am J Pub Health* 2014;104(11):e18-e21. doi: [10.2105/AJPH.2014.302174](https://doi.org/10.2105/AJPH.2014.302174)
- ⁹⁷ Public Health Law Center. *The New Federal Tobacco-21 Law: What it Means for State, Local, and Tribal Governments*, January 15, 2020. Accessed October 19, 2020. <https://publichealthlawcenter.org/blogs/2020-01-07/new-federal-tobacco-21-law-what-it-means-state-local-and-tribal-governments>
- ⁹⁸ Marynak K, Mahoney M, Williams KS, Tynan MA, Reimels E, King BA. State and territorial laws prohibiting sales of tobacco products to persons aged <21 years — United States, December 20, 2019. *MMWR Morb Mortal Wkly Rep*. 2020;69(7):189-92. doi: <http://dx.doi.org/10.15585/mmwr.mm6907a3>
- ⁹⁹ Public Health Law Center. *The New Federal Tobacco-21 Law: What it Means for State, Local, and Tribal Governments*, January 15, 2020. Accessed October 19, 2020. <https://publichealthlawcenter.org/blogs/2020-01-07/new-federal-tobacco-21-law-what-it-means-state-local-and-tribal-governments>
- ¹⁰⁰ Marynak K, Mahoney M, Williams KS, Tynan MA, Reimels E, King BA. State and territorial laws prohibiting sales of

- tobacco products to persons aged <21 years — United States, December 20, 2019. *MMWR Morb Mortal Wkly Rep.* 2020;69(7):189-92. doi: <http://dx.doi.org/10.15585/mmwr.mm6907a3>
- ¹⁰¹ Public Health Law Center. *The New Federal Tobacco-21 Law: What it Means for State, Local, and Tribal Governments*, January 15, 2020. Accessed October 19, 2020. <https://publichealthlawcenter.org/blogs/2020-01-07/new-federal-tobacco-21-law-what-it-means-state-local-and-tribal-governments>
- ¹⁰² U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration. *Revision to Guidance*, June 12, 2020. Available at: <https://www.samhsa.gov/sites/default/files/synar-guidance-tobacco-21.pdf>
- ¹⁰³ Public Health Law Center. *The New Federal Tobacco-21 Law: What it Means for State, Local, and Tribal Governments*, January 15, 2020. Accessed October 19, 2020. <https://publichealthlawcenter.org/blogs/2020-01-07/new-federal-tobacco-21-law-what-it-means-state-local-and-tribal-governments>
- ¹⁰⁴ Marynak K, Mahoney M, Williams KS, Tynan MA, Reimels E, King BA. State and territorial laws prohibiting sales of tobacco products to persons aged <21 years — United States, December 20, 2019. *MMWR Morb Mortal Wkly Rep.* 2020;69(7):189-92. doi: <http://dx.doi.org/10.15585/mmwr.mm6907a3>
- ¹⁰⁵ Lee JG, Shook-Sa BE, Bowling JM, Ribisl KM. Comparison of sampling strategies for tobacco retailer inspections to maximize coverage in vulnerable areas and minimize cost. *Nicotine & Tob Research* 2017;20(11):1353-8. doi: <https://doi.org/10.1093/ntr/ntx149>
- ¹⁰⁶ CDC State Tobacco Activities Tracking and Evaluation (STATE) System. *CDC STATE System Tobacco Legislation – Youth Access*. Accessed October 19, 2020. <https://www.cdc.gov/STATESystem/>
- ¹⁰⁷ Public Health Law Center. *The New Federal Tobacco-21 Law: What it Means for State, Local, and Tribal Governments*, January 15, 2020. Accessed October 19, 2020. <https://publichealthlawcenter.org/blogs/2020-01-07/new-federal-tobacco-21-law-what-it-means-state-local-and-tribal-governments>
- ¹⁰⁸ Marynak K, Mahoney M, Williams KS, Tynan MA, Reimels E, King BA. State and territorial laws prohibiting sales of tobacco products to persons aged <21 years. — United States, December 20, 2019. *MMWR Morb Mortal Wkly Rep.* 2020;69(7):189-92. doi: <http://dx.doi.org/10.15585/mmwr.mm6907a3>
- ¹⁰⁹ Winickoff JP, Hartman L, Minghua LL, Chen ML, Gottlieb M, Nabi-Burza E, DiFranza JR. Retail impact of raising tobacco sales age to 21 years. *Am J Pub Health* 2014;104(11):e18-e21. doi: [10.2105/AJPH.2014.302174](https://doi.org/10.2105/AJPH.2014.302174)
- ¹¹⁰ Winickoff JP, Hartman L, Minghua L, Chen ML, Gottlieb M, Nabi-Burza E, DiFranza JR. Retail impact of raising tobacco sales age to 21 years. *Am J Pub Health* 2014;104(11):e18-e21. doi: [10.2105/AJPH.2014.302174](https://doi.org/10.2105/AJPH.2014.302174)
- ¹¹¹ Campaign for Tobacco-Free Kids. *States and Localities That Have Raised the Minimum Legal Sale Age for Tobacco Products to 21*. Accessed December 9, 2020. https://www.tobaccofreekids.org/assets/content/what_we_do/state_local_issues/sales_21/states_localities_MLSA_21.pdf
- ¹¹² Glover-Kudon R, Gammon DG, Rogers T, et al. Cigarette and cigar sales in Hawaii before and after implementation of a Tobacco 21 Law. *Tob Control* 2021;30(1):98-102. doi: <https://doi.org/10.1136/tobaccocontrol-2019-055248>
- ¹¹³ Glover-Kudon R, Gammon DG, Rogers T, et al. Cigarette and cigar sales in Hawaii before and after implementation of a Tobacco 21 Law. *Tob Control* 2021;30(1):98-102. doi: <https://doi.org/10.1136/tobaccocontrol-2019-055248>
- ¹¹⁴ Ali FRM, Rice K, Fang X, et al. Tobacco 21 policies in California and Hawaii and sales of cigarette packs: a difference-in-differences analysis. *Tob Control* 2020;29(5):588-92.
- ¹¹⁵ Oregon Health Authority. *Oregon's Tobacco 21 Law: Impact Evaluation*. May 2019. Available at: <https://www.oregon.gov/oha/PH/PREVENTIONWELLNESS/TOBACCPREVENTION/Documents/Oregon-Tobacco-21-Impact-Evaluation-Report.pdf>
- ¹¹⁶ Liber AC, Xue Z, Cahn Z, Drope J, Stoklosa M. Tobacco 21 adoption decreased sales of cigarette brands purchased by young people: a translation of population health survey data to gain insight into market data for policy analysis. *Tob Control* 2020. Epub ahead of print. doi: <https://doi.org/10.1136/tobaccocontrol-2020-055932>
- ¹¹⁷ Friedman AS, Wu RJ. Do local tobacco-21 laws reduce smoking among 18 to 20-year olds? *Nicotine & Tob Research* 2020;22(7):1195-1201. doi: <https://doi.org/10.1093/ntr/ntz123>
- ¹¹⁸ Winickoff JP, Hartman L, Minghua L, Chen ML, Gottlieb M, Nabi-Burza E, DiFranza JR. Retail impact of raising tobacco sales age to 21 years. *Am J Public Health* 2014;104(11):e18-e21. doi: [10.2105/AJPH.2014.302174](https://doi.org/10.2105/AJPH.2014.302174)
- ¹¹⁹ King BA, Jama AO, Marynak KL, Promoff GR. Attitudes toward raising the minimum age of sale for tobacco among U.S. adults. *Am J Prev Med.* 2015;49(4):583-8.
- ¹²⁰ King BA, Jama AO, Marynak KL, Promoff GR. Attitudes toward raising the minimum age of sale for tobacco among U.S. adults. *Am J Prev Med.* 2015;49(4):583-8.
- ¹²¹ Zhang X, Vuong TD, Andersen-Rodgers E, et al. Evaluation of California's 'Tobacco 21' law. *Tob Control* 2018;27:656-62.