

E-CIGARETTES: POLICY GUIDANCE



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The introduction of e-cigarettes (also known as Electronic Nicotine Delivery Systems (ENDS)) in countries around the world poses challenges to governments wanting to protect youth and reduce tobacco use and nicotine addiction.

E-cigarettes are addictive nicotine products whose use carries health risks to individuals in the short-term, and health effects of long-term use remain unknown.¹⁻³ The industry heavily markets e-cigarettes to young people as lifestyle products.⁴

Although e-cigarettes may have health benefits to individual smokers if they help those smokers quit smoking completely,¹ their availability is harmful to public health if they:

- Lead to more young people initiating nicotine and/or tobacco use
- Renormalize tobacco use
- Discourage smokers from quitting

Any assessment of the health risks of e-cigarettes must consider the impact on the population as a whole, not only to individual smokers.

In the absence of effective government regulation, e-cigarettes could create a new generation of nicotine and tobacco users and undermine the progress made in combatting the tobacco epidemic.

Governments should act quickly to apply one of three regulatory options:

1. Ban the sale of e-cigarettes entirely
2. Regulate e-cigarettes as medicinal/pharmaceutical products
3. Regulate e-cigarettes by strictly applying measures that align with the WHO Framework Convention on Tobacco Control (WHO FCTC)

E-cigarettes and the WHO Framework Convention on Tobacco Control (WHO FCTC)

The World Health Organization (WHO) has concluded that e-cigarettes are “harmful” and that countries that have not banned e-cigarettes should ensure that “their tobacco control laws and regulations are comprehensive enough to regulate all forms of novel and emerging nicotine and tobacco products.”⁴ This is consistent with the general obligations of the WHO FCTC, which require Parties to the Convention to implement measures for preventing and reducing nicotine addiction.⁵

This resource uses a three-step process to assist governments in determining which regulatory option fits their country circumstances while balancing competing public health considerations:

1. PURSUE PUBLIC HEALTH POLICY GOALS

The public health policy goals for any government regulating e-cigarettes should be to:

- 1.1 Prevent e-cigarette use by non-smokers, particularly youth
- 1.2 Minimize potential health risks to e-cigarette users and non-users
- 1.3 Prevent e-cigarettes from undermining progress in reducing tobacco consumption and nicotine addiction
- 1.4 Protect public health policy from the commercial interests of the tobacco and e-cigarette industries
- 1.5 Assist smokers to quit and avoid use of multiple tobacco and nicotine products

2. ASSESS COUNTRY-SPECIFIC CIRCUMSTANCES

- 2.1 Existing market for e-cigarettes
- 2.2 Current status of tobacco control measures
- 2.3 Trends in smoking rates
- 2.4 Government capacity and resources

3. SELECT REGULATORY OPTION

- 3.1 Complete sales ban
- 3.2 Regulate as medicinal/pharmaceutical products
- 3.3 Regulate strictly applying WHO FCTC measures

1. PURSUE PUBLIC HEALTH POLICY GOALS

The reasons and evidence supporting the public health policy goals are set out below. For more details on the evidence, see [E-Cigarettes: Evidence and Health Harms](#).

1.1 Prevent e-cigarette use by non-smokers, particularly youth

Youth and young people are using e-cigarettes at high rates.

- Many countries, including the United States, Canada, and several European countriesⁱ like England have experienced high levels of e-cigarette use by young people.⁶⁻¹⁰ In the United States and Canada, e-cigarettes are the most commonly used tobacco or nicotine product among youth aged 16-19,¹⁰ and preliminary data indicate that past 30-day e-cigarette use among youth aged 16-19¹⁰ has increased substantially from 2017 to 2022 in Canada (9%, 16%), England (8%, 24%), and the US (11%, 15%).¹¹

E-cigarette use by non-smokers is associated with subsequent tobacco use.

- There is strong evidence indicating that non-smokers who use e-cigarettes are three times as likely to go on to smoke conventional cigarettes.³

Marketing and sales practices target non-smokers and young people.

- Youth use of e-cigarettes is impacted by several factors, including industry marketing, product design, nicotine delivery, flavorings, and the nature and extent of government regulation.
- E-cigarette marketing follows the tobacco industry's playbook to reach young people, including promotions via music festivals and social media channels.^{4,12}
- Recent market trends show an increase in the sale of e-cigarettes that deliver high levels of nicotine more efficiently and with less irritation, making it easier for young people to initiate use and develop addiction.²
- The industry targets youth with sweet and fruit flavored products. Research shows adolescents consider flavor as an important factor when trying e-cigarettes and are more likely to initiate e-cigarette use with flavored products.⁴

i. For example: In Italy, 17.5% of youth aged 13-15 reported current e-cigarette use (2018); in Albania, 9.3% (2020); and in Moldova, 12.7% (2019).

1.2 Minimize potential health risks to e-cigarette users and non-users

E-cigarette use carries health risks.²

- Although e-cigarette aerosol has been shown to contain markedly lower levels of harmful constituents as compared to conventional cigarette smoke,¹ emissions still contain toxins such as acrolein and diethylene glycol, acetaldehyde and formaldehyde (known carcinogens), and heavy metals such as nickel, tin, and lead.¹³
- Use of e-cigarettes may increase the heart rate, increase systolic blood pressure, and cause irritation to the upper respiratory tract and eyes of bystanders. Increased risk of cancer cannot be ruled out for bystanders, and non-users should not be exposed to secondhand aerosols from e-cigarettes.¹⁴
- Short-term use of e-cigarettes is associated with health harms such as addiction, dual use with cigarette smoking, acute nicotine toxicity, seizures, increase in heart rate and blood pressure, and damage to DNA and the respiratory system.^{1,3}
- E-cigarettes are evolving rapidly, and a wide variety of products are currently available with differing nicotine concentrations, e-liquid contents, and device features, which makes it difficult to assess health harms across the entire category of e-cigarettes.¹⁵
- The long-term health impacts of e-cigarette use are not yet clear.³

Nicotine in any form is harmful and addictive for young people.

- Youth use of nicotine in any form, including e-cigarettes, is unsafe. Nicotine is a highly addictive drug and can harm adolescent brain development, particularly the parts of the brain responsible for attention, memory, and learning.^{16,17}

1.3 Prevent e-cigarettes from undermining progress in reducing tobacco consumption and nicotine addiction

As was the case with cigarette smoking, the broad public health implications of the use of e-cigarettes at the population-level will likely not be known for decades.

- In the 18th century, lung cancer was a rare form of disease and was first reported in the medical literature in 1912.¹⁸ It was not until 50 years later, in 1964, that the US Surgeon General reported that smoking caused lung cancer (and other health harms).¹⁹

The availability of e-cigarettes will impact:

Youth initiation

- At a time when many countries are seeing significant reductions in youth tobacco use, e-cigarettes are creating a new generation of nicotine-dependent young people and undermining progress in reducing overall youth tobacco use. In countries like Canada, England, and the United States, e-cigarette use remains a serious public health concern given the uncertain long-term health effects of use and the association between e-cigarette use and subsequent use of conventional cigarettes.^{7, 9, 10, 20}
- There is substantial evidence that e-cigarette use increases the risk of conventional cigarette smoking initiation among youth and non-smokers.^{1, 3}

Renormalization of smoking behavior

- Public health researchers have raised concerns that e-cigarette use will renormalize smoking behaviors.^{21, 22}

- Industry marketing practices explicitly include renormalizing nicotine consumption and depicting recreational use of e-cigarettes, including use in indoor venues.²³

Relapse of former smokers and discouraging quit attempts

- The use of e-cigarettes is associated with a significant increased risk of cigarette smoking relapse among former smokers who have successfully quit.²⁴
- E-cigarettes may discourage smokers from fully quitting smoking and prolong dual use of conventional cigarettes and e-cigarettes.²⁵

1.4 Protect public health policy from the commercial interests of the tobacco and e-cigarette industries

The industry has a profit motive.

- E-cigarette manufacturers have a profit motive, not a public health motive. Their primary goal is to sell as many products as possible and maintain or grow their customer base.

E-cigarettes are part of the tobacco industry's new global strategy.

- Tobacco companies have made significant investments in the global e-cigarette market.^{26,27} These investments can be interpreted as a strategic business decision to compensate for a shrinking customer base – global cigarette consumption has been steadily declining since 2012 and is forecasted to continue to fall.²⁸
- Tobacco industry investments in the e-cigarette market raise serious concerns given the industry's history of targeting youth, deceiving the public about the deadly consequences of using tobacco products and the addictiveness of nicotine, and fighting against proven tobacco control measures.²⁹
- The major tobacco companies all include e-cigarettes in their marketing and public relations strategies³⁰ in an attempt to increase their influence and credibility in policy and regulation decisions.²⁷

The industry lobbies governments and policymakers to seek favorable e-cigarette regulation.

- E-cigarette manufacturers, including the major tobacco companies, are spending millions of dollars on lobbying lawmakers and regulators in countries around the world to seek favorable e-cigarette regulation.³⁰⁻³³

Research reaches different conclusions depending on funding.

- Like research funded by cigarette companies, research funded by e-cigarette interests produces results that show e-cigarettes as less harmful. Work not funded by the e-cigarette industry shows comparatively higher dangers.³⁴

1.5 Assist smokers to quit and avoid use of multiple tobacco and nicotine products

There is inadequate evidence on the use of e-cigarettes as smoking cessation aids.

- According to the US Surgeon General, use of e-cigarettes could have potential benefits to current adult smokers who transition completely, but the continually changing and diverse nature of e-cigarettes makes it difficult to generalize about the efficacy of cessation based on clinical trials of specific products.²
- While some individual studies and reviews, including two Cochrane reviews, have found e-cigarettes may help smokers switch from conventional cigarettes, comprehensive reviews by leading health authorities have found the overall evidence inconclusive.³⁵
- The US Surgeon General's Report on Cessation,² the WHO's Report on the Global Tobacco Epidemic,⁴ and the European Union's Scientific Committee on Health, Environmental and Emerging Risks³⁶ have concluded that there is inadequate evidence to infer that using e-cigarettes increases the success of smoking cessation.
- The Australian National University's NCEPH also concluded there is limited evidence that e-cigarettes are an effective aid for cessation. Use of such products by smokers trying to quit is more likely to lead to greater long-term exposure to nicotine, compared to other cessation measures.^{3,20}
- To date, there is no e-cigarette on the market anywhere in the world that has been medically licensed and sold as a smoking cessation product.

Dual use of e-cigarettes and conventional cigarettes is common.

- Several countries report a high level of dual use of e-cigarettes and conventional cigarettes.³⁷⁻³⁹ The NCEPH states that "[t]he most common pattern of e-cigarette use in many countries, including Australia, is dual tobacco smoking and e-cigarette use."³
- Data from Global Youth Tobacco Surveys from 2014-2019 in 67 countries indicate that dual use of e-cigarettes and conventional cigarettes among youth was greater than 5% in 15 countries and highest in Poland (14%), Italy (10%), Latvia (8.6%), and Indonesia (8.5%).⁴⁰
- Smokers who continue to smoke, even if they smoke fewer conventional cigarettes per day, and also use e-cigarettes (dual use) do not reduce their exposure to harmful toxicants¹³ and will increase their individual risk if this delays or prevents cessation.^{8,41}

2. ASSESS COUNTRY-SPECIFIC CIRCUMSTANCES

There are several factors that governments should consider when determining how best to regulate e-cigarettes given the unique situation in each country. *However, no single factor will dictate the best regulatory option. Instead, the circumstances must be considered together to determine the soundest policy approach.*

2.1 Existing market for e-cigarettes

Whether there is an existing market for e-cigarettes is a factor in determining how to regulate these products.

Limited or small market in e-cigarettes:

Governments should consider banning their sale or regulating them as medicinal products before the products become established in the population. If a government chooses to go this route, it must act quickly as a ban may no longer be feasible once a market is established.

Significant or well-established legal adult market in e-cigarettes:

Governments should consider strict regulation using tobacco control measures rather than a sales ban or medicinal regulation. If there is already a well-established legal adult market for e-cigarettes, a ban might be impractical and potentially raise concerns about creating an illicit market.

2.2 Current status of tobacco control measures

Fully implementing WHO FCTC measures and giving them time to produce results is the most effective approach for reducing tobacco use and nicotine addiction. These proven policies encourage and assist smokers to quit while also preventing young people from initiating tobacco use.

Comprehensive WHO FCTC measures regulating tobacco products have not yet been fully implemented, or more time is needed for measures to take effect:

Governments should consider banning e-cigarettes or regulating them as medicinal products. This would allow time to maximize the number of people who quit smoking completely while avoiding the risk of creating a new generation addicted to nicotine and preventing the other health risks associated with e-cigarette use. In addition, if e-cigarettes were allowed onto the market and subsequently regulated under the less-than-comprehensive WHO FCTC measures in place for tobacco products, the industry would be able to market e-cigarettes in a way that is attractive to youth and non-smokers.

Comprehensive WHO FCTC measures have been fully implemented for tobacco products with time given for them to take effect:

Governments could consider strictly regulating e-cigarettes using tobacco control measures. This approach would allow e-cigarettes to be available to those smokers who are nicotine dependent while minimizing the risk of young people and non-smokers being attracted to them via marketing, product design, or social norms.

2.3 Trends in smoking rates

Trends in smoking rates should be taken into account to prevent e-cigarettes from undermining progress in reducing tobacco consumption and nicotine addiction.

Smoking rates are falling as a result of comprehensive WHO FCTC measures:

Governments should consider a ban on e-cigarettes to allow as many people to quit as possible as a result of evidence-based tobacco control strategies. Allowing e-cigarettes onto the market may undermine that progress. Alternatively, governments could consider regulating them as medicinal products, which would make approved products available to smokers who cannot otherwise quit while keeping them out of the hands of young people and non-smokers.

Smoking rates have declined in all segments of the population (e.g. youth, vulnerable communities) following the implementation of comprehensive WHO FCTC measures, but the decline has stalled:

If there are indications that e-cigarettes would assist the remaining smokers to quit, governments could consider allowing the sale of e-cigarettes, strictly regulated using tobacco control measures. However, the benefit to smokers who may quit smoking using e-cigarettes would need to be weighed against concerns that young people may be attracted to and begin to use e-cigarettes, and that existing smokers may start to use e-cigarettes as well and delay quit attempts.

2.4 Government capacity and resources

Effective regulation of tobacco and nicotine products requires the responsible health agency to have the authority, capacity, and resources for:

- Effective enforcement of rules for the manufacture, sale, and marketing of tobacco and nicotine products.
- Effective surveillance of population use patterns (including youth initiation and dual/poly use), marketing of, and consumer attitudes towards e-cigarettes.
- Government-led messaging around the health risks and harms of e-cigarette use.^{42,43}

Limited capacity and resources devoted to enforcement, surveillance, and messaging:

Governments should consider prohibiting the sale of e-cigarettes at least until such time that the appropriate infrastructure is in place.

Sufficient capacity and resources devoted to enforcement, surveillance, and messaging:

Governments could consider allowing e-cigarettes onto the market and strictly regulating them using WHO FCTC measures. Devoting sufficient resources as described above will help governments minimize initiation of e-cigarettes by young people and non-smokers.

Robust medicinal/pharmaceutical approval process:

Governments that have concluded that e-cigarettes hold significant potential as smoking cessation aids could consider regulating e-cigarettes under their medicinal/pharmaceutical regime if a robust approval process is in place. Health authorities should have sufficient expertise and resources to conduct pre-market approval and post-market surveillance and to undertake case-by-case product assessments considering the variety of e-liquids and devices and the different toxic emissions of e-cigarettes. Technical guidance on medicinal/pharmaceutical regulation of e-cigarettes is outside the scope of this resource. However, the UK government's Guidance for Licensing Electronic Cigarettes and Other Inhaled Nicotine-Containing Products as Medicines is an example of the enhanced regulatory capacity and expertise needed to license e-cigarettes as medicines/pharmaceuticals.⁴⁴

3. SELECT REGULATORY OPTION

Taking into account the public health policy goals and country-specific circumstances, the following regulatory options should be considered:

3.1 Complete sales ban

E-cigarettes may not be manufactured, imported, or sold.

Factors that favor this option:

- Strong WHO FCTC measures are not yet in place, or strong WHO FCTC measures are in place, smoking rates are steadily falling as a result and these measures should be given more time to take effect.
- The existing e-cigarette market is sufficiently small to make effective enforcement of a ban feasible.
- The government has limited capacity and resources to implement, monitor, and enforce the strict regulation of e-cigarettes using tobacco control measures or under a medicinal regulatory regime and provide strong public messages about the appropriate use of e-cigarettes.

- The precautionary principle is applied: there is significant scientific uncertainty about the overall risks and potential benefits of e-cigarette use, although there is certainty that nicotine products are harmful to youth. Therefore, a ban could be justified until more research and information is available.

At least 34 countries/jurisdictions ban the manufacture, import, and/or sale of e-cigarettes.

In addition to a ban on manufacture, importation, and/or sale, several of these countries prohibit the use of e-cigarettes in public and their advertising, promotion, and sponsorship. This is advisable to remove any uncertainty as to whether their use and promotion are permitted.

3.2 Regulate as medicinal/pharmaceutical products

Specific e-cigarettes are only allowed for sale if the individual product has been approved under a country's established medicinal/pharmaceutical regime.

Factors that favor this option:

- The existing e-cigarette market is sufficiently small – regulating them as medicinal/pharmaceutical products would remove all existing products from the market unless or until any are granted a medicinal license.
- Smoking rates are steadily declining as a result of implementing strong tobacco control measures.
- A robust medicinal/pharmaceutical approval process and post-market surveillance capacity exist.
- The government has sufficient resources to undertake case-by-case product assessments taking into account the variety of e-liquids and devices, and the different toxic emissions of e-cigarettes.

- The government has concluded that evidence shows certain e-cigarettes hold significant potential as smoking cessation aids.

At least three countries/jurisdictions permit the sale of e-cigarettes only by prescription or under a medicinal or pharmaceutical product license.

To date, there is no e-cigarette on the market anywhere in the world that has been medically licensed and sold as a smoking cessation product.

3.3 Regulate strictly applying WHO FCTC measures

E-cigarettes are subject to requirements that align with the WHO FCTC.

Factors that favor this option:

- There is a well-established existing legal market in e-cigarettes, making effective enforcement of a ban difficult.
- Strong WHO FCTC measures are in place, have had time to take effect, and the effects are being monitored.
- Declines in smoking rates have stalled and prevalence remains at an unacceptable level.
- The government has concluded that e-cigarettes hold significant potential to help its remaining smokers quit conventional cigarette use, and this potential benefit outweighs concerns of youth uptake of e-cigarettes and conventional tobacco products, delayed quit attempts, and dual/poly use.
- The government has sufficient capacity and resources to implement, monitor, and enforce the strict regulation of e-cigarettes using WHO FCTC measures, and a strong commitment to government-led messaging about the health risks and harms of e-cigarette use.

At least 88 countries/jurisdictions regulate e-cigarettes using tobacco control measures.

Optional – Some of these countries require manufacturers to apply for approval to sell a particular e-cigarette as a medicinal/pharmaceutical product if:

- A manufacturer wants to make a claim that the e-cigarette could be used as a cessation aid; or
- An e-cigarette or e-liquid has a nicotine concentration above a certain threshold.

This option should only be considered if a robust medicinal/pharmaceutical approval process exists. There is currently no e-cigarette on the market that has been medically licensed and is being sold as a smoking cessation product.

FOR MORE INFORMATION, SEE E-CIGARETTES: GLOBAL REGULATION AND RECOMMENDED MEASURES.

FURTHER DETAILS ON COUNTRIES' EXISTING LAWS REGULATING E-CIGARETTES ARE AVAILABLE AT WWW.TOBACCOCONTROLLAWS.ORG.

REFERENCES

1. National Academies of Sciences, Engineering, and Medicine (NASEM). Public Health Consequences of E-Cigarettes, Washington, DC. The National Academies Press, 2018. Accessed April 11, 2023. <http://nationalacademies.org/hmd/Reports/2018/public-health-consequences-of-e-cigarettes.aspx>
2. US 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. Smoking Cessation. A Report of the Surgeon General. 2020. Accessed April 11, 2023. <https://www.hhs.gov/sites/default/files/2020-cessation-sgr-full-report.pdf>
3. Banks E, Yazidjoglou A, Brown S, et al. Electronic cigarettes and health outcomes: systematic review of global evidence. Report for the Australian Department of Health. April 2022. Accessed April 11, 2023. https://openresearch-repository.anu.edu.au/bitstream/1885/262914/1/Electronic%20cigarettes%20health%20outcomes%20review_2022_WCAG.pdf
4. World Health Organization. WHO report on the global tobacco epidemic 2021: addressing new and emerging products. July 27, 2021. Accessed April 11, 2023. <https://apps.who.int/iris/rest/bitstreams/1359088/retrieve>
5. WHO Framework Convention on Tobacco Control. Article 5.2(b). Accessed April 11, 2023. <https://apps.who.int/iris/rest/bitstreams/50793/retrieve>
6. US Department of Health and Human Services, Centers for Disease Control and Prevention. Global Youth Tobacco Survey (GYTS). Accessed April 11, 2023. <https://www.cdc.gov/tobacco/global/gtss/gtssdata/index.html>
7. Cooper M, Park-Lee E, Chunfeng R, Cornelius M, Jamal A, Cullen KA. Notes from the field: E-Cigarette use among middle and high school students— United States, 2022. MMWR Morb Mortal Wkly Rep 2022;71:1283–1285. doi:<http://dx.doi.org/10.15585/mmwr.mm7140a3>
8. Kinnunen JM, Rimpelä AH, Lindfors PL, et al., Electronic Cigarette Use Among 14- to 17-year-olds in Europe. Eur J Public Health. 2021; 31: 402-408. doi:<https://doi.org/10.1093/eurpub/ckaa145>
9. Statistics Canada. Canadian Tobacco and Nicotine Survey, 2021. May 5, 2022. Accessed April 11, 2023. <https://www150.statcan.gc.ca/n1/daily-quotidien/220505/dq220505c-eng.htm>
10. East KA, Reid JL, Rynard VL, Hammond D. Trends and Patterns of Tobacco and Nicotine Product Use Among Youth in Canada, England, and the United States From 2017 to 2019. Journ Adolesc Health. 2021 Sep;69(3):447-456. doi:10.1016/j.jadohealth.2021.02.011
11. Hammond D, Reid J, Bansal-Travers M, Cummings M, et al. Trends in vaping among youth in Canada, England, and the United States: Patterns of Use, Vaping Products, and Indicators of Dependence. March 2023. Slide 6. Presented at Society for Research on Nicotine and Tobacco.
12. McCausland K, Maycock B, Leaver T, Jancey J. The Messages Presented in Electronic Cigarette-Related Social Media Promotions and Discussion: Scoping Review. JMIR. 2019; 21: e11953. doi:<https://doi.org/10.2196/2F11953>
13. American Lung Association. What's in an E-Cigarette? 2020. Accessed April 11, 2023. <https://www.lung.org/quit-smoking/e-cigarettes-vaping/whats-in-an-e-cigarette>
14. Visser WF, Klerx WN, Cremers HWJM, Ramlal R, Schwillens PL, Talhout R. The Health Risks of Electronic Cigarette Use to Bystanders. Int. J. Environ. Res. Public Health. 2019; 16: 1525. doi:10.3390/ijerph16091525
15. Marques P, Piqueras L, Sanz MJ. An Updated Overview of E-Cigarette Impact on Human Health. Respir Res. 2021; 22: 1-14. doi:10.1186/s12931-021-01737-5
16. US Department of Health and Human Services, Centers for Disease Control and Prevention, Office of Smoking and Health. The Health Consequences of Smoking: 50 Years of Progress. A Report of the Surgeon General. 2014. Accessed April 11, 2023. <https://www.ncbi.nlm.nih.gov/books/n/surgsmoke50/pdf/>
17. US Center for Disease and Control Prevention. About Electronic Cigarettes (E-Cigarettes). Accessed April 11, 2023. https://www.cdc.gov/tobacco/basic_information/e-cigarettes/about-e-cigarettes.html
18. Proctor RN. The history of the discovery of the cigarette–lung cancer link: evidentiary traditions, corporate denial, global toll. Tob Control. 2012;21:87-91. doi:10.1136/tobaccocontrol-2011-050338
19. Advisory Committee to the Surgeon General of the Public Health Service. Smoking and Health. 1964. Accessed April 12, 2023. <https://profiles.nlm.nih.gov/spotlight/nn/catalog/nlm:nlmuid-101584932X202-doc>
20. Australian National University, National Centre for Epidemiology and Population Health. Summary Brief: Review of Global Evidence on the Health Effects of Electronic Cigarettes. April 2022. Accessed April 12, 2023. <https://nceph.anu.edu.au/files/E-cigarettes%20health%20outcomes%20review%20summary%20brief%202022.pdf>
21. Chen JC, Ho SY, Leung LT, Wang MP, Lam TH. School-level electronic cigarette use prevalence and student-level tobacco use intention and behaviors. Sci Rep. 2019; 9:1690. doi:10.1038/s41598-018-38266-z
22. Fairchild AL, Bayer R, Colgrove J. The Renormalization of Smoking? E-Cigarettes and the Tobacco "Endgame". The N Engl J Med. 2014; 370: 293-295. doi:10.1056/NEJMp1313940
23. Centers for Disease Control and Prevention. E-cigarette Ads and Youth. 2017. Accessed April 11, 2023. <https://www.cdc.gov/vitalsigns/ecigarette-ads/index.html>
24. Everard CD, Silveira ML, Kimmel HL, et al. Association of electronic nicotine delivery system use with cigarette smoking relapse among former smokers in the United States. JAMA Netw Open. 2020;3(6). doi: 10.1001/jamanetworkopen.2020.4813
25. Kalkhoran S, Glantz SA. E-cigarettes and smoking cessation in real-world and clinical settings: a systematic review and meta-analysis. Lancet Respir Med. 2016;4(2):116–28. doi:10.1016/S2213-2600(15)00521-4

REFERENCES

26. Stopping Tobacco Organizations and Products. Addiction at Any Cost: Philip Morris International Uncovered. 2020. Accessed April 11, 2023. https://exposetobacco.org/wp-content/uploads/STOP_Report_Addiction-At-Any-Cost.pdf
27. Mathers A, Hawkins B, Lee K. Transnational Tobacco Companies and New Nicotine Delivery Systems. *Am J Public Health*. 2019;109(2):227-235. doi:10.2105/AJPH.2018.304813
28. Euromonitor International.® Market Sizes. Retail Volume, World, Cigarettes. 2007-2025. Accessed November 9, 2022.
29. US District Court. United States vs. Philip Morris USA, Inc., et. al., 99-CV-02396GK, Final Opinion (2006). Accessed April 6, 2023. https://www.justice.gov/sites/default/files/civil/legacy/2014/09/11/amended%20opinion_0.pdf
30. WHO FCTC Knowledge Hub on Article 5.3. Dangers of the 'Unsmoke' Campaign: Frequently Asked Questions. August 17, 2019. Accessed April 6, 2023. <https://extranet.who.int/fctcapps/fctcapps/fctc/kh/TIInterference/news/dangers-unsmoke-campaign-frequently-asked-questions>
31. University of Bath. Tobacco Tactics. Lobbying Regulators. Accessed April 2, 2023. <https://tobaccotactics.org/wiki/e-cigarettes/>
32. Open Secrets. (Filings held on [opensecrets.org](https://www.opensecrets.org) show JUUL spent nearly \$2.3 million on federal lobbying in 2021 and almost \$2.5 million in 2022). Accessed April 11, 2023. <https://www.opensecrets.org/federal-lobbying/clients/summary?cycle=2022&id=D000070920>
33. Meyer T. Nickles will lobby for Juul. *Politico*. July 29, 2019. Accessed April 11, 2023. <https://www.politico.com/newsletters/politico-influence/2019/07/29/nickles-will-lobby-for-juul-462611>
34. Pisinger C, Godtfredsen N, Bender A. A conflict of interest is strongly associated with tobacco industry-favourable results, indicating no harm of e-cigarettes. *Prev Med*. 2019;119. doi:10.1016/j.ypmed.2018.12.011
35. Hartman-Boyce J, Lindson N, Butler AR, et al. Electronic Cigarettes for Smoking Cessation. *Cochrane Database Sys Rev*. 2022; Nov 17; 11(11). doi:10.1002/14651858.CD010216.pub7; Lindson N, Theodoulou A, Ordóñez-Mena JM, et al. Pharmacological and electronic cigarette interventions for smoking cessation in adults: component network meta-analyses. *Cochrane Database Syst Rev*. 2023;9(9):CD015226. Published 2023 Sep 12. doi:10.1002/14651858.CD015226.pub2
36. European Commission. Scientific Committee on Health, Environmental and Emerging Risks. Opinion on electronic cigarettes. April 16, 2021. Accessed April 11, 2023. https://health.ec.europa.eu/system/files/2022-08/scheer_o_017.pdf
37. Action on Smoking and Health. Use of e-cigarettes (vapes) among adults in Great Britain. August 2022. Accessed April 11, 2023. <https://ash.org.uk/uploads/Use-of-e-cigarettes-vapes-among-adults-in-Great-Britain-2022.pdf>
38. Reid JL, Hammond D, Tariq U, Burkhalter R, Rynard VL, Douglas O. Tobacco Use in Canada: Patterns and Trends. 2022. Accessed April 12, 2023. https://uwaterloo.ca/tobacco-use-canada/sites/default/files/uploads/files/tobacco_use_in_canada_2022_4.pdf
39. US Centers for Disease Control, Morbidity and Mortality Weekly from the National Center for Health Statistics. Percentage Distribution of Cigarette Smoking Status Among Current Adult E-Cigarette Users, by Age Group – National Health Interview Survey. United States, 2021. *MMWR Morb Mortal Wkly Rep*. 2023 Mar 10;72(10):270. doi:10.15585/mmwr.mm7210a7
40. Sreeramareddy CT, Acharya K, Manoharan A. Electronic cigarettes use and 'dual use' among the youth in 75 countries: Estimates from Global Youth Tobacco Surveys (2014–2019). *Sci Rep*. 2022 Dec 5;12(1):20967. doi:10.1038/s41598-022-25594-4
41. Owusu D, Huang J, Weaver SR, et al., Patterns and Trends of Dual Use of E-Cigarettes Among US Adults, 2015–2018. *Pre Med Resp*. 2019; 16:101009. doi:<https://doi.org/10.1016/j.pmedr.2019.101009>
42. World Health Organization. Tobacco product regulation: basic handbook. 2018. Accessed April 11, 2023. <https://apps.who.int/iris/rest/bitstreams/1149524/retrieve>
43. World Health Organization. WHO Study Group on Tobacco Product Regulation: report on the scientific basis of tobacco product regulation: fifth report of a WHO study group. *World Health Organ Tech Rep Ser*. 2015;(989):1-234. Accessed April 11, 2023. <https://apps.who.int/iris/handle/10665/161512>
44. Medicines and Healthcare products Regulatory Agency. Guidance for licensing electronic cigarettes and other inhaled nicotine-containing products as medicines. Updated November 3, 2022. Accessed April 2, 2023. <https://www.gov.uk/guidance/licensing-procedure-for-electronic-cigarettes-as-medicines>