

**Ongoing research on youth vaping
& gap analysis
Ann McNeill, August 2022**

OHID commissioned evidence update, **in press** – youth chapter

Nicotine vaping in England: an evidence update including health risks and perceptions, August 2022

A report commissioned by the Office for Health Improvement and Disparities

Authors: Ann McNeill, Erikas Simonavičius, Leonie Brose, Eve Taylor, Katherine East, Elizabeth Zuikova, Robert Calder, Debbie Robson
King's College London



**1. ASH Smoke-free
Great Britain Youth
Survey (ASH-Y)**

**2. International Tobacco
Control Youth Tobacco &
Vaping Survey (ITC-Y):
England, Canada, US**

ASH-Y surveys

1. ASH Smoke- free Great Britain Youth survey (ASH-Y)	ASH & YouGov Plc 2013- (Feb/ Mar 2022) ANNUAL	CRUK & BHF core funding	11-18 yr olds England n=2,259 (2022)	Online repeated cross-sectional survey Detailed questions including behaviours, types, brands, sources of products, promotion, attitudes, urges to use
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ITC-Y surveys

2. ITC-Y Surveys	Univ. of Waterloo & Nielsen Panel 2019-2022 Now ANNUAL	CRUK & BHF core funding	Previously 16-19, now 16-29 yr olds England n=4,224 (& CA, US) (2022)	Online repeated cross-sectional survey Detailed questions including behaviours, types, brands, sources of products, promotion, attitudes, dependency
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Original Investigation | Public Health

Evaluating the Outcomes of the Menthol Cigarette Ban in England by Comparing Menthol Cigarette Smoking Among Youth in England, Canada, and the US, 2018-2020

Katherine A. East, PhD; Jessica L. Reid, MSc; Robin Burkhalter, MMath; Loren Kock, PhD; Andrew Hyland, PhD; Geoffrey T. Fong, PhD; David Hammond, PhD

Abstract

IMPORTANCE Menthol cigarettes were prohibited in England in May 2020 and nationally in Canada in October 2017 but remain permitted in the US. Evidence on the outcomes of menthol cigarette bans among youth outside of Canada, and the characteristics of youth smokers, is lacking.

Key Points

Question How was the menthol cigarette ban in England associated with menthol cigarette smoking among youth smokers?

[Open Peer Review on Geios](#)

Purchasing and sourcing of e-cigarettes among youth in Scotland and England following Scotland's implementation of an e-cigarette retail register and prohibition of e-cigarette sales to under-18s

Katherine East¹, Jessica Reid², Sara Hitchman¹, David Hammond²

¹ King's College London

² University of Waterloo

Funding: This work was supported by a P01 Grant (P01CA200512) from the US National Institutes of Health. Additional support was provided by a Canadian Institutes of Health Research (CIHR)–Public Health Agency of Canada (PHAC) Applied Public Health Research Chair (DH). KE is the recipient of Fellowship funding from the UK Society for the Study of Addiction (SSA).

Title
E-cigarette flavors, devices and brands used by youth before and after partial flavor restrictions in the US: Findings from the ITC Youth Tobacco and Vaping Surveys in Canada, England, and the US, 2017-2020

David Hammond¹, Jessica L. Reid¹, Robin Burkhalter¹, Maansi Bansal Travers², Shannon Gravelly³, Andy Hyland², Karin Kasza², and Ann McNeill⁴

1. School of Public Health Sciences, University of Waterloo, Waterloo, Ontario, Canada
2. Roswell Park Comprehensive Cancer Center, Buffalo, New York, USA
3. Department of Psychology, University of Waterloo, Waterloo, Ontario, Canada
4. Department of Addictions, Institute of Psychiatry, Psychology & Neuroscience, King's College London, London, UK

Nicotine and Tobacco Research, 2022, 24, 1386–1395
<https://doi.org/10.1093/ntr/ntac088>
Advance access publication 3 April 2022
Original Investigation



Exposure to Negative News Stories About Vaping, and Harm Perceptions of Vaping, Among Youth in England, Canada, and the United States Before and After the Outbreak of E-cigarette or Vaping-Associated Lung Injury ('EVALI')

Katherine East PhD^{1,2}, Jessica L. Reid MSc¹, Robin Burkhalter MMath¹, Olivia A. Wackowski PhD³, James F. Thrasher PhD⁴, Harry Tattan-Birch MSc⁵, Christian Boudreau PhD⁶, Maansi Bansal-Travers PhD⁷, Alex C. Liber PhD⁸, Ann McNeill PhD², David Hammond PhD¹

¹School of Public Health Sciences, Faculty of Health, University of Waterloo, Waterloo, ON, Canada

²National Addiction Centre, Institute of Psychiatry, Psychology and Neuroscience, King's College London, London, UK

³School of Public Health, Rutgers, The State University of New Jersey, Piscataway, NJ, USA

⁴Arnold School of Public Health, University of South Carolina, Columbia, SC, USA

⁵Department of Behavioural Science and Health, Institute of Epidemiology and Health Care, University College London, London, UK

⁶Department of Statistics and Actuarial Science, University of Waterloo, ON, Canada

⁷Department of Health Behavior, Roswell Park Comprehensive Cancer Center, Buffalo, NY, USA

⁸Cancer Prevention and Control, Lombardi Comprehensive Cancer Center, Georgetown University, Washington, DC, USA

Corresponding Author: Katherine East, PhD, School of Public Health Sciences, Faculty of Health, University of Waterloo, ON, Canada. E-mail: katherine.east@uwaterloo.ca

Forthcoming – Taylor et al, shortfill use by youth in England

Other relevant surveys

3. Smoking, Drinking & Drugs Survey (SDD)	NHS Digital, Ipsos Mori Biennial	Government	11-15 years 2021 data due Sept 6th 2022 England	Schools face-to-face
4. Smoking Toolkit Study	UCL, Ipsos Mori Monthly	CRUK	16+ 2011 until Feb 2020 18 + April 2020- Dec 2021 16+ from Jan 22 GB	Household, then online repeated cross-sectional survey
5. Health Survey for England (HSE)	NHS Digital, Natcen, UCL	Government	Children 2-15, and 16+ 2021 data due Dec 2022	Household

King's Nicotine Research Group studies

“What is the impact of vaping and smoking on nicotine intake and toxin exposure among youth in England compared with youth in north America?”

Funder: National Institute for Health & Care Research

Summary: Originally done as part of ITC-Y surveys but COVID barrier, now community study in England.

Age: 16-19 yr olds

About to go in field to recruit 200 ppts who vape, smoke, vape & smoke, do neither

Questionnaires & urine sample to assess biomarkers (nicotine, 1-HOP, NNAL, VOCs)

Opportunity to include new disposable users

Who else involved:

University of Waterloo, Canada

Roswell Park Comprehensive Cancer Centre, US

King's Nicotine Research Group studies

“Youth responses to e-cigarettes, e-cigarette retailing, & e-cigarette packaging in England, Canada, & US the US”

Funder: Cancer Research UK

Summary:

- Developed a code book to document packaging of EC products & to assess packaging characteristics across popular products purchased from the 3 countries & online.
- Level & types of e-cigarette marketing at point-of-sale, online (not physical due to COVID) in GB using audits & content analysis (assessing TRPR & CAP Code)
- Online experiments in youth to assess impact of standardised vs branded packaging (summary of one expt in latest ASH-Y survey report)
- Further analysis of relevant ITC-Y data

Who else involved: University of Waterloo, Canada; University of Carolina San Francisco, US; Action on Smoking & Health

Dr Katie East fellowship

“What influences vaping harm perceptions among young adults and how can they be modified?”

Funder: Society for the Study of Addiction

Summary:

- 1. Country differences & trends in vaping perceptions & smoker/vaper characteristics (ITC-Y surveys 2017-21)**
- 2. Environmental scan of education campaigns & e-cigarette public health messaging in England, Canada, the US: trends (2018-2021) and country differences**
- 3. Patterns & longitudinal predictors of vaping perceptions & vaping/smoking behaviours – uses ALSPAC Birth Cohort data**

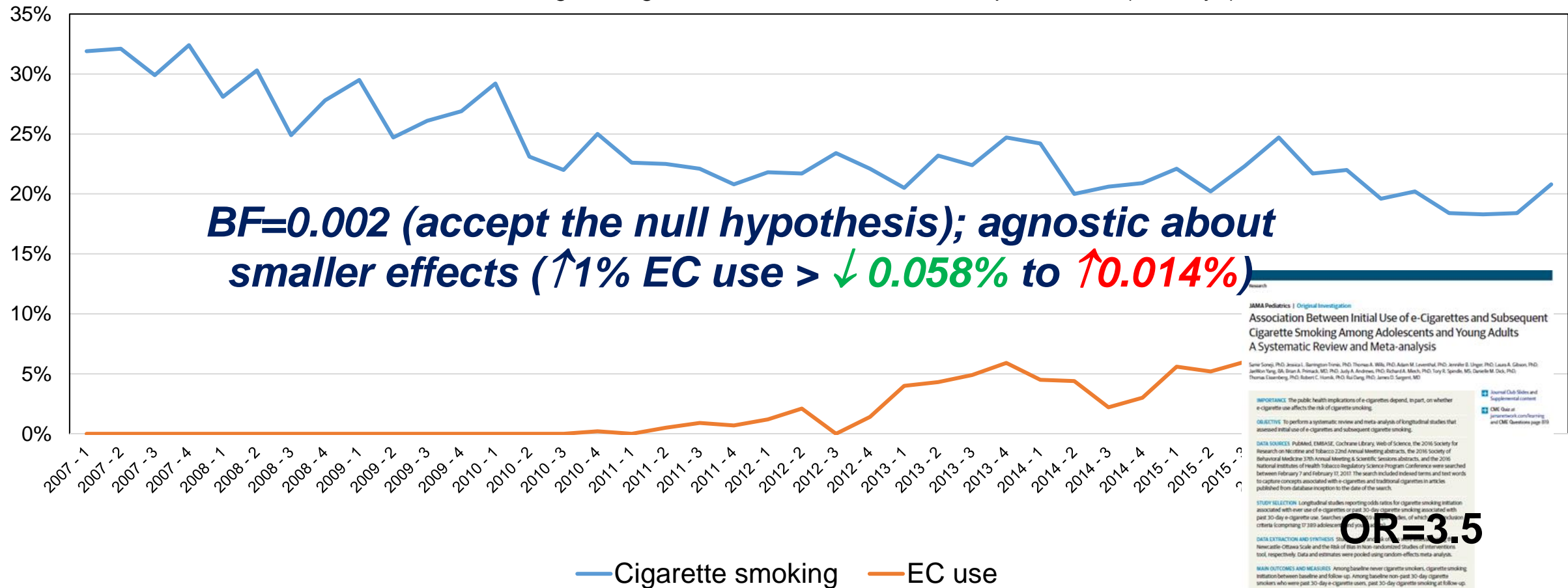
Who else involved:

University of Waterloo

University of Bristol

Time-series of UK data

Ever Regular Cigarette use and current EC use prevalence (16-24 yo)



JAMA Pediatrics | Original Investigation
Association Between Initial Use of e-Cigarettes and Subsequent Cigarette Smoking Among Adolescents and Young Adults: A Systematic Review and Meta-analysis

Samir Saigal, PhD, Jessica L. Barrington-Tovey, PhD, Thomas A. Wills, PhD, Adam M. Lewitoff, PhD, Jennifer B. Unger, PhD, Laura A. Gohm, PhD, Jeffrey Yang, BA, Brian A. Primack, MD, July A. Andrews, PhD, Richard A. Mack, PhD, Tony R. Spindle, MD, Danielle M. Dale, PhD, Thomas Eisenberg, PhD, Robert C. Hornik, PhD, Rui Dong, PhD, James D. Sugrue, MD

IMPORTANCE: The public health implications of e-cigarettes depend, in part, on whether e-cigarette use affects the risk of cigarette smoking.

OBJECTIVES: To perform a systematic review and meta-analysis of longitudinal studies that assessed initial use of e-cigarettes and subsequent cigarette smoking.

DATA SOURCES: PubMed, EMBASE, Cochrane Library, Web of Science, the 2016 Society for Research on Nicotine and Tobacco 22nd Annual Meeting abstracts, the 2016 Society of Behavioral Medicine 27th Annual Meeting & Scientific Sessions abstracts, and the 2016 National Institutes of Health Tobacco Regulatory Science Program Conference were searched between February 7 and February 11, 2017. The search included indexed terms and text words to capture concepts associated with e-cigarettes and traditional cigarettes in articles published from database inception to the date of the search.

STUDY SELECTION: Longitudinal studies reporting odds ratios for cigarette smoking initiation associated with ever use of e-cigarettes or past 30-day cigarette smoking associated with past 30-day e-cigarette use. Searches were limited to English-language articles, of which 343 articles met the inclusion criteria (comprising 17 389 adolescents and young adults).

DATA EXTRACTION AND SYNTHESIS: Studies were screened for eligibility, and data were extracted. Newcastle-Ottawa Scale and the Risk of Bias in Non-randomized Studies of Interventions tool, respectively. Data and estimates were pooled using random-effects meta-analysis.

MAIN RESULTS AND MEASURES: Among baseline never cigarette smokers, cigarette smoking initiation between baseline and follow-up among baseline non-past 30-day cigarette smokers who were past 30-day e-cigarette users, past 30-day cigarette smoking at follow-up.

RESULTS: Among 17 389 adolescents and young adults, the ages ranged between 14 and 30 years at baseline, and 56.0% were female. The pooled probability of cigarette smoking initiation was 23.2% for baseline ever e-cigarette users and 7.2% for baseline never e-cigarette users. The pooled probability of past 30-day cigarette smoking at follow-up were 21.0% for baseline past 30-day e-cigarette users and 4.4% for baseline non-past 30-day e-cigarette users. Adjusting for known demographic, psychosocial, and behavioral risk factors for cigarette smoking, the pooled odds ratio for subsequent cigarette smoking initiation was 3.50 (95% CI, 2.38-5.16) for ever vs never e-cigarette users, and the pooled odds ratio for past 30-day cigarette smoking at follow-up was 4.28 (95% CI, 2.52-7.21) for past 30-day e-cigarette vs non-past 30-day e-cigarette users at baseline. A moderate level of heterogeneity was observed among studies ($I^2 = 56%$).

CONCLUSIONS AND RELEVANCE: E-cigarette use was associated with greater risk for subsequent cigarette smoking initiation and past 30-day cigarette smoking. Strong e-cigarette regulation could potentially curb use among youth and possibly limit the future population-level burden of cigarette smoking.

Author Affiliations: Author affiliations are listed at the end of this article.
Corresponding Author: Samir Saigal, PhD, The Center for Tobacco Use and Public Health, Dartmouth College School of Medicine, One Medical Center Drive, Lebanon, NH 03756 (samir.saigal@dartmouth.edu).

JAMA Pediatr. 2017;171(11):1005-1013. doi:10.1001/jamapediatrics.2017.0888
 Published online June 26, 2017. Accessed November 13, 2017

jamapediatrics.com

- No evidence of an association
 - $\beta = -0.015$ 95%CI -0.046 to 0.016; **p=0.341**

Smoking Toolkit Study: Individual-level analysis

Rapid growth in disposable e-cigarette vaping among young adults in Great Britain from 2021 to 2022: a repeat cross-sectional survey

Harry Tattan-Birch^{1,2*}, Sarah E Jackson^{1,2}, Loren Kock^{1,2}, Martin Dockrell³, Jamie Brown^{1,2}

1. *Department of Behavioural Science and Health, University College London, London, UK*

2. *SPECTRUM Consortium, UK*

3. *Addictions and Inclusion, Office for Health Improvement and Disparities, London, UK*

To estimate recent trends in the prevalence of disposable e-cigarette vaping in GB

From Jan 2021-Jan 2022, 14-fold increase in use of disposables (1.2% to 16.7%) overall with largest increase **from 0.9% to 56.7% for 18-year olds**

UCL researchers examination of US surveys - instructive



Qeios, CC-BY 4.0 · Article, September 2, 2020

[Open Peer Review on Qeios](#)

Epidemic of youth nicotine addiction? What does the National Youth Tobacco Survey 2017-2019 reveal about high school e-cigarette use in the USA?

Martin Jarvis¹, Sarah Jackson¹, Robert West¹, Jamie Brown¹

¹ University College London, University of London

Funding: JB received unrestricted research funding from Pfizer, who manufacture smoking cessation medications. RW undertakes research and consultancy for and receives travel funds and hospitality from manufacturers of smoking cessation medications (Pfizer, GlaxoSmithKline and Johnson and Johnson). All authors declare no financial links with tobacco companies or e-cigarette manufacturers or their representatives.

Potential competing interests: JB received unrestricted research funding from Pfizer, who manufacture smoking cessation medications. RW undertakes research and consultancy for and receives travel funds and hospitality from manufacturers of smoking cessation medications (Pfizer, GlaxoSmithKline and Johnson and Johnson). All authors declare no financial links with tobacco companies or e-cigarette manufacturers or their representatives.

Abstract

Background: Between 2018 and 2020, the US Food and Drug Administration announced various restrictions on e-cigarette manufacturers in response to a perceived epidemic of e-cigarette use and nicotine dependence among high school students. The stimulus came from headline figures from the 2018 and 2019 National Youth Tobacco Survey

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<https://doi.org/10.1093/ntn/ntac035>

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Commentary



Unpacking the Gateway Hypothesis of E-Cigarette Use: The Need for Triangulation of Individual- and Population-Level Data

Lion Shahab PhD^{1,2}, Jamie Brown PhD^{1,2}, Lies Boelen PhD³, Emma Beard PhD^{1,2}, Robert West PhD¹, Marcus R. Munafò PhD^{2,4,5}

¹Department of Behavioural Science and Health, University College London, London, UK

²SPECTRUM Consortium, Edinburgh, UK

³Sandtable Ltd, London, UK

⁴School of Psychological Science, University of Bristol, Bristol, UK

⁵MRC Integrative Epidemiology Unit, University of Bristol, Bristol, UK

Corresponding Author: Lion Shahab, PhD, Department of Behavioural Science and Health, University College London, 1-19 Torrington Place, London WC1E 6BT, UK. Telephone: 44-207679-1895; Fax: 44-207813-2848; E-mail: lion.shahab@ucl.ac.uk

As recent publications in *N&TR* highlight,¹ there is considerable debate whether e-cigarettes act as a causal gateway to subsequent smoking in adolescents. Answering this question requires a clear specification of what we mean by “gateway” in this context. Unlike the original hypothesis, which postulated a causal progression from legal/“soft” (eg, alcohol) to illicit/“hard” (eg, heroin) polydrug use, initiated in adolescence,² current gateway discussions in tobacco control center around the idea of what is essentially a transition from less (e-cigarettes) to more harmful (cigarettes) and from less of one

individuals or populations, and longitudinal comparisons of individuals or populations over time.

At the individual level, numerous cross-sectional and prospective studies show a strong positive association between e-cigarette use and smoking cigarettes.⁴ Young people who report using e-cigarettes are more likely to report smoking, both concurrently and in the future. However, these studies are potentially subject to measurement error (eg, misreporting of smoking status, especially among youth⁵) and confounding.⁶ Just because e-cigarettes are used alongside cigarettes, it does not mean they are causing them.

Dr Jasmine Khouja research

- PhD: causes and consequences of e-cigarette use
- Current and upcoming work includes:
 - An e-liquid flavour ban policy decision aid (apply to disposables)
 - Interviews with smokers and vapers regarding the impact of hypothetical flavour bans
 - Online study of flavoured versus unflavoured e-liquid packaging influence on subjective ratings in adolescents
 - Survey of adolescent disposable use and development of a school intervention


RESEARCH ARTICLE






Association of genetic liability to smoking initiation with e-cigarette use in young adults: A cohort study

Jasmine N. Khouja , Robyn E. Wootton, Amy E. Taylor, George Davey Smith, Marcus R. Munafò

Published: March 18, 2021 • <https://doi.org/10.1371/journal.pmed.1003555>

Review

Is e-cigarette use in non-smoking young adults associated with later smoking? A systematic review and meta-analysis 

 Jasmine N Khouja ^{1, 2, 3},  Steph F Suddell ^{1, 3, 4},  Sarah E Peters ⁵,  Amy E Taylor ^{2, 4},  Marcus R Munafò ^{1, 3}

Correspondence to Dr Jasmine N Khouja, MRC Integrative Epidemiology Unit, University of Bristol, Bristol BS8 1 UK; jasmine.khouja@bristol.ac.uk

A multivariable Mendelian randomisation study exploring the direct effects of nicotine on health compared with the other constituents of tobacco smoke: Implications for e-cigarette use

 Jasmine N Khouja,  Eleanor Sanderson,  Robyn E Wootton, Amy E Taylor,  Marcus R Munafò

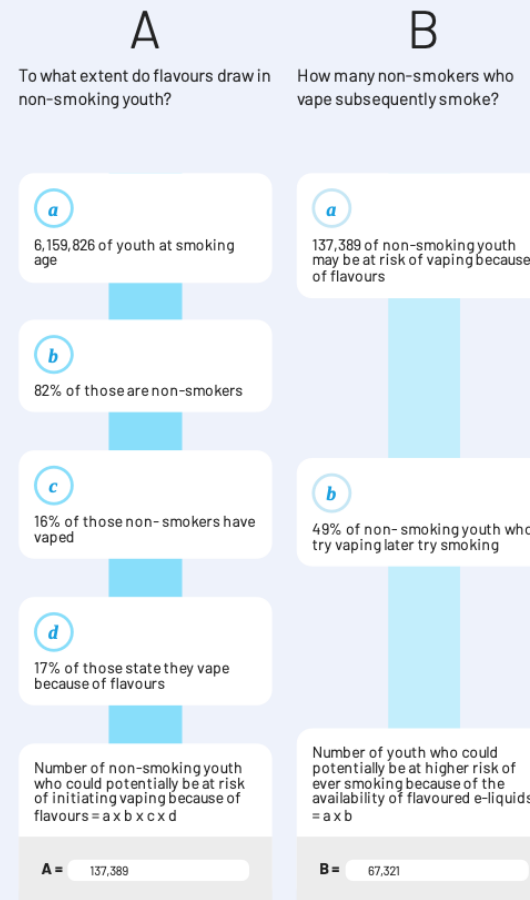
doi: <https://doi.org/10.1101/2021.01.12.21249493>

Dr Jasmine Khouja research

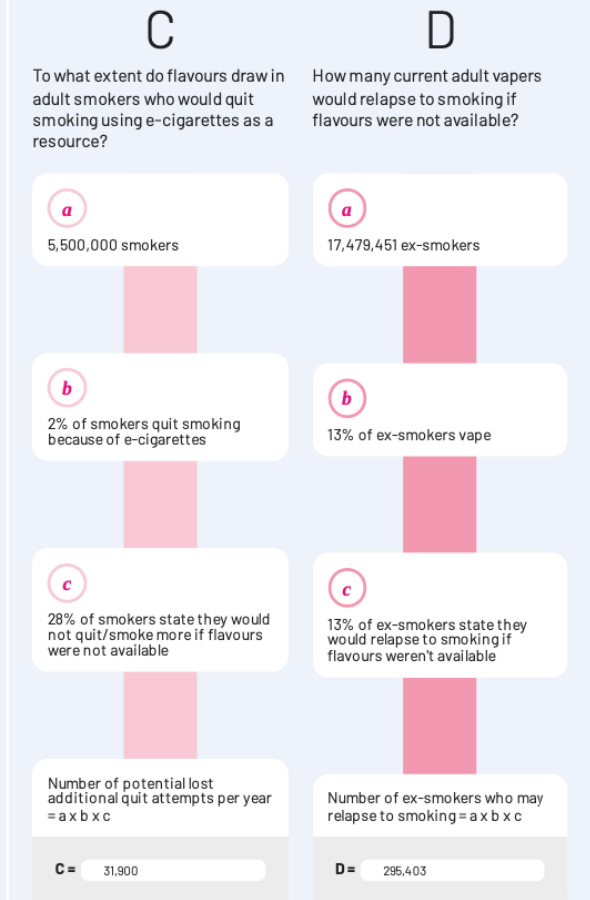
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 - An e-liquid flavour ban policy decision aid (apply to disposables)
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<https://doi.org/10.21203/rs.3.rs-2054093/v1>
 - Online study of flavoured versus unflavoured e-liquid packaging influence on subjective ratings in adolescents
 - Survey of adolescent disposable use and development of a school intervention

E-LIQUID POLICY DECISION AID

HEALTH PROTECTION OF FLAVOUR RESTRICTION



HEALTH COST OF FLAVOUR RESTRICTIONS



POLICY DECISIONS

A-(C+D)

Positive values indicate the number of youth vaping due to flavours outweighs the number of smokers and ex-smokers not smoking due to flavours.

Negative values indicate the number of smokers and ex-smokers who are not smoking due to flavours outweighs the number of youth vaping due to flavours.

B-(C+D)

Positive values indicate the number of youth smoking due to flavours outweighs the number of smokers and ex-smokers not smoking due to flavours.

Negative values indicate the number of smokers and ex-smokers who are not smoking due to flavours outweighs the number of youth smoking due to flavours.

Research led by Prof. Graham Moore from Univ. of Cardiff (Prof Linda Bauld)

Objectives

- Does increased regulation of e-cigarettes interrupt the current trajectory of young people's e-cigarette use?
- How do young people perceive risks and social norms surrounding e-cigarettes (and how do these change over time as products become TPD compliant): a. as a product in their own right? b. relative to tobacco?
- How do young people interpret and respond to the presence or absence of health warnings on e-cigarette packets?
- To what extent, and in what ways, do young people continue to interact with e-cigarette marketing (e.g. via online marketing) after the prohibition of cross-border advertising?

Summary

- ASH research is excellent and fills a much-needed gap
- ITC research in England (funded by O/S funders) is highly relevant & explores policy impacts
- Smoking Toolkit data provides very valuable contemporaneous data
- Unique biomarker data from youth through NIHR funded extension, also of disposable users
- CRUK packaging study will also enable closer examination of packaging of disposables
- Several other relevant research studies underway (including some not discussed today) – results over next 1-2 years

Research gaps (also drawing on ASH/SPECTRUM response)

- Audit of other national surveys to check vaping adequately covered & ensure adequate funding of current surveys
- More focused research on disposables
 - Are the products used legal or illegal
 - Why are they so attractive
 - Flavours, taste, nicotine dependency
- Health warning impact on youth
- Advertising restrictions needed for youth
- More generally, impact of TRPR constraints e.g nicotine limit?
- Facilitate analysis of the MHRA database
- Regular toxicology testing of products on market