THE UK ELECTRONIC CIGARETTE RESEARCH FORUM

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Electronic Cigarette Research Briefing – March & April 2021

This research briefing is part of a series of monthly updates aiming to provide an overview of new studies on electronic cigarettes. The briefings are intended for researchers, policy makers, health professionals and others who may not have time to keep up to date with new findings and would like to access a summary that goes beyond the study abstract. The text below provides a critical overview of each of the selected studies then puts the study findings in the context of the wider literature and research gaps.

The studies selected and further reading list do not cover every e-cigarette-related study published each month. Instead, they include high profile studies most relevant to key themes identified by the UK Electronic Cigarette Research Forum; including efficacy and safety, smoking cessation, population level impact and marketing. For an explanation of the search strategy used, please see the end of this briefing.

You can find our previous research briefings at www.cruk.org/UKECRF.

If you would prefer not to receive this briefing in future, just let us know.

Research Call from The Prevention and Population Research Committee (PPRC)

Cancer Research UK's PPRC will shortly be opening the following funding opportunities for research relevant to tobacco control:

- **PPRC Project Award** – opening late May 2021 and closing 22/07/21
- **PPRC Programme Award** – opening late May 2021 and closing 23/09/21

Let's talk e-cigarettes – University of Oxford Podcasts

Jamie Hartmann-Boyce and Nicola Lindson discuss the April 2021 update to the Cochrane living review of electronic cigarettes for smoking cessation and respond to questions from listeners. This podcast is a companion to this Cochrane Review and shares the evidence from monthly searches and review findings.

Subscribe with iTunes or Spotify to listen to regular updates or find all episodes on the University of Oxford Podcasts site.
This podcast series is funded by CRUK.

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

- **Study Aims**

  This longitudinal UK study assessed the association between genetic liability to smoking initiation and ever/regular e-cigarette use at age 24 in participants (n= 7,859) of European ancestry. Genetic liability to smoking was determined by calculating polygenic risk scores (PRS) using the GWAS & Sequencing Consortium of Alcohol and Nicotine use summary statistics. The association of PRS with negative control variables (including Socioeconomic position (SEP) at birth and risk-taking in young adulthood) were also assessed to investigate whether shared genetic risk factors influenced several behaviours (horizontal pleiotropy) or whether smoking initiation was the route to e-cigarette use. Five p-value thresholds ranging from 5×10^{-8} to 0.5 were used to calculate 5 PRS for each individual to assess horizontal pleiotropy.

- **Key Findings**

  At all PRS thresholds, there were positive associations between the PRS for smoking initiation and both ever ($O_{10\text{-}8}R$=1.24, 95%CI=1.14-1.34, p<0.001) and regular (at least monthly) ($OR_{10\text{-}8}$=1.18, 95%CI=1.00-1.40, p=0.049) e-cigarette use at 24 years.

  In participants who had not initiated smoking, there was a positive association between the PRS for smoking initiation and ever e-cigarette use at the p=0.5 threshold ($OR_{0.5}$=1.18, 95%CI=1.04-1.35, p=0.012). However, this was not sustained at more stringent thresholds.

  At all p-value thresholds, there were positive associations between the PRS for smoking initiation and having ≥11 sexual partners by 23 years ($OR_{10\text{-}8}$ = 1.15, 95% CI 1.05 to 1.26, p = 0.003) and having ever gambled by 24 years ($OR_{10\text{-}8}$ = 1.12, 95% CI 1.03 to 1.22, p = 0.008).

  At the p=0.005 threshold, there was a positive association between the PRS for smoking initiation and enjoying taking risks at age 24 ($OR_{0.005)}$ = 1.11, 95%CI=1.03-1.19, p=0.005). However, this was not sustained at more stringent thresholds. No association between smoking initiation PRS and being in trouble with the law since turning 23 was observed.

  At all p-value thresholds, there were positive associations between PRS and lower parental SEP ($OR_{10\text{-}8}$=1.08, 95%CI=1.01-1.16, p=0.017).

- **Limitations**

  The sample size was relatively small which may reduce the accuracy of estimates.

  Smoking, vaping status and most negative control variables were self-reported, so may be subject to recall bias.

  Participants in the study were approximately 17 years old when e-cigarettes became widely available. Therefore, their exposure to e-cigarettes during adolescence was limited.

  In one analysis, the sample was restricted to never smokers. As smoking initiation PRS was strongly associated with smoking initiation, restricting by smoking status could introduce

collider bias which may inflate associations between smoking initiation PRS and e-cigarette use.

The analysis could only be conducted in participants of European ancestry. Therefore, the findings are not generalisable to other ethnic groups.

The attrition rate in the cohort was relatively high and loss to follow up has previously been related to smoking initiation PRS. This may introduce selection bias.

Khouja JN, Wootton RE, Taylor AE, Davey Smith G, Munafò MR. Association of genetic liability to smoking initiation with e-cigarette use in young adults: A cohort study. PLoS Med. 2021 Mar 18;18(3):e1003555. doi: 10.1371/journal.pmed.1003555. PMID: 33735204; PMCID: PMC7971530.

2. England SimSmoke: the impact of nicotine vaping on smoking prevalence and smoking-attributable deaths in England

- **Study Aims**

  This English study generated the model "SimSmoke" which predicts smoking rates in England in a scenario without nicotine vaping products (NVPs), accounting for effects of policy and advertising interventions. The model was validated by comparison of estimated smoking rates to national survey data from 2000-2012 (before NVPs became widely available). SimSmoke estimations were then compared to 2012-2019 survey data to calculate the impact of NVPs on reductions in adult smoking prevalence from 2012-2019 and resulting smoking attributable deaths from 2012-2052.

- **Key Findings**

  SimSmoke estimations of changes in adult smoking rates up to 2012 were generally consistent with survey data. SimSmoke estimated a decline in adult (16+) smoking of 23.7% in men and 27.2% in women between 2000 and 2012. The Opinion and Lifestyle Survey (OPN) reported a decline in adult (16+) smoking of 23.1% in men and 28.4% in women.

  Based on data from the Annual Population Survey (APS), NVP attributable relative reduction in adult (18+) smoking prevalence from 2012-2019 was 20.2% (18.8%-22.0%) for males and 20.4% (18.4%-22.2%) for females.

  Based on data from OPN, NVP attributable relative reduction in adult (16+) smoking prevalence from 2012-2019 was 14.2% (4.2%‑23.7%) for males and 14.6% (14.0%‑20.5%) for females.

  Based on data from APS, NVP attributable reductions in smoking prevalence for ages 18‑24 were 27.2% (22.8%‑31.6%) for males and 31.7% (27.4%‑36.5%) for females. For ages 25-34, NVP attributable reductions in smoking prevalence were 18.6% (15.2-21.8%) for males and 15.0% (11.1-18.8%) for females, with similar reductions observed for ages 35+.

  Based on the model using data from APS, 107238 (86501-127621) male and 58422 (45952-71879) would be averted due to NVPs over the period 2012-2052.

- **Limitations**

  The impact of NVPs indicated by the results may have been influenced by factors not considered in the SimSmoke model, for example changes in public attitudes and tobacco company's activities.

  The effects of policy interventions and cuts to anti-tobacco campaigns in 2010 on smoking rates may have been understated in the model. This may have impacted the effects of NVPs observed.

  The analysis of NVP associated deaths averted was not pre-registered so the results should be considered exploratory.

  UK data on rates of smoking cessation relapse were not available in UK so estimates were based on US data which may not be relevant to the UK context.

Levy DT, Sánchez-Romero LM, Li Y, Yuan Z, Travis N, Jarvis MJ, Brown J, McNeill A. (2021). England SimSmoke: the impact of nicotine vaping on smoking prevalence and smoking-attributable deaths in England. *Addiction*. 2021 May;116(5):1196-1211. doi: 10.1111/add.15269.

3. Differences between ethnic groups in self-reported use of e-cigarettes and nicotine replacement therapy for cutting down and temporary abstinence: a cross-sectional population-level survey in England

- **Study Aims**

  This English study reviewed data collected from 24,114 smokers (aged 16+) from 2013-2019. Logistic regression was used to assess differences in e-cigarette and nicotine replacement therapy (NRT) use for smoking reduction or temporary abstinence between ethnic groups. Changes in product use over time across different ethnic groups were also assessed. Results were adjusted for age, gender, cigarette dependency and socio-economic status.

- **Key Findings**

  Compared to white participants, those of Asian and Arab/other ethnicities were less likely to use e-cigarettes for cutting down and temporary abstinence (ORs=0.79, 95%CI=0.66-0.93, p=0.005 and 0.58, 95%CI=0.4-0.83, p=0.003, respectively).

  There was no significant difference in use of e-cigarettes between participants of White ethnicity and participants of Mixed/multiple (p=0.589) or Black ethnicities (p=0.255).

  Compared to white participants, those of mixed/multiple ethnicity were more likely to use NRT for cutting down and temporary abstinence (OR=1.42, 95%CI=1.04-1.94, p=0.027).

  There were no significant differences in NRT use between White and Asian (p=0.069), Black (p=0.200) or Arab/other (p=0.851) ethnicities.

- **Limitations**

This study only reported product use at single time points. Therefore, it cannot tell us about patterns of use in individuals over time or determine causality.

The analysis did not control for all possible confounders that could affect results. Therefore, this study may be vulnerable to confounding.

Reported ethnicities were categorised into five broad ethnic groups. Therefore, differences in product use within these groups cannot be determined.

Participants were asked if they used the products for smoking reduction, or when in situations where they could not smoke. Therefore, the study did not consider differences in the use of these products for smoking cessation.

The sample size for some categories was relatively small which may have affected the accuracy of estimates.

The study did not consider other methods of smoking reduction – for example behavioural support or prescription medication. Therefore, it is unclear whether different groups are more likely to use these options.

Beard E, Brown J, Jackson SE, Tattan-Birch H, Shahab L. (2021.) Differences between ethnic groups in self-reported use of e-cigarettes and nicotine replacement therapy for cutting down and temporary abstinence: a cross-sectional population-level survey in England. *Addiction.* doi: 10.1111/add.15431.

4. The emerging norms of e-cigarette use among adolescents: A meta-ethnography of qualitative evidence

- **Study Aims**

  This systematic review of qualitative studies examined perceptions of e-cigarettes in adolescents and young adults. A meta-ethnographic approach was used to translate findings across the 13 included studies to produce new interpretations. Attitudes, understandings and behaviours were classified by a social norms framework where descriptive norms indicate the prevalence of a belief or behaviour and injunctive norms indicate approval or disapproval of the behaviour.

- **Key Findings**

  Participants had mixed understandings and perceptions of addiction. Whilst some were knowledgeable about e-cigarette's nicotine content and addictiveness, others demonstrated that they did not understand the concept of addiction or that e-cigarettes were addictive.

  Discussions of addiction were weighted towards descriptive norms, as participants were aware of the theme but did not express a clear opinion towards it.

  Participants cited a range of views on harm perceptions of e-cigarettes including concerns around their unknown long-term impact and that they were less harmful than smoking. Studies also reported difficulty in finding credible information on the topic and suggested that marketing played a role in their perceptions.

The weight of the evidence for approval/disapproval of e-cigarettes based on participant's harm perceptions was relatively evenly split, so a consensus on an injunctive norm could not be found.

An injunctive norm was identified that parents/authority figures approved of e-cigarettes if they were used to stop smoking, but not if they were used by never smokers. E-cigarettes becoming increasingly approved of by adolescents compared with smoking was also identified as an injunctive norm.

Views on peer approval were mixed, with some participants citing vaping as a "cool" activity but others expressing disapproval and a feeling that it had fallen out of fashion.

- **Limitations**

  This review is vulnerable to any limitations of the individual studies included. It is unclear how representative the studies were with regards to factors such as ethnicity and socio-economic status. Therefore, the results may not be generalisable.

  Most studies recruited a broad range of adolescents and did not analyse findings by age groups. Therefore, results may vary between younger/older adolescents.

  It was not possible to analyse the data by varying smoking/vaping statuses. Therefore, it is not possible to determine if the identified norms vary between these groups.

  Most studies were from the US or UK. Therefore, the findings may not be applicable to other countries with different policy environments.

Smith H, Lucherini M, Amos A, Hill S. (2021). The emerging norms of e-cigarette use among adolescents: A meta-ethnography of qualitative evidence. Int J Drug Policy. doi: 10.1016/j.drugpo.2021.103227.

Overview

This month we include studies examining genetics and smoking/vaping, modelling the impact of vaping on smoking-related outcomes, ethnicity and smoking reduction, and a review of qualitative studies on perceptions of e-cigarettes among youth and young adults.

The first paper examines genetic liability to starting smoking with e-cigarette use in young adults. The authors wanted to find out if polygenic risk scores (PRS) for starting smoking were linked to ever use of e-cigarettes. PRS are an estimate of an individual's genetic liability to a disease or trait. Participants (just under 8,000 individuals) were drawn from ALSPAC which is a birth cohort study in England and were on average 24 years of age and all of European ancestry. Using well established methods, the researchers assessed whether genetic liability to smoking was associated with using e-cigarettes or whether there were shared genetic risk factors influencing several behaviours.

They looked at genetic variants that are associated with smoking and also self-reported smoking status, whether a participant reported ever having tried vaping and also self-report of four types of risk-taking behaviours (having been in trouble with the law, number of sexual partners, ever

gambling and enjoying taking risks). 30% of participants reported ever using an e-cigarette at 24 years and 5% were regular vapers. The study found a positive association, as other studies have done, between genetic liability to start smoking (smoking initiation PRS) and actual smoking status (self-reported smoking). But they also found a positive link between smoking initiation PRS and ever e-cigarette use, even among non-smokers. This may mean that people who are genetically more likely to become smokers but manage to avoid smoking may be more likely to try vaping. They also found an association between a genetic pre-disposition to smoking and some risk-taking behaviours, and therefore that this disposition may also influence e-cigarette use. In other words, young adults who smoke or vape may be more likely to do so because they are pre-disposed to engage in risk taking behaviour in general.

This month's second study uses simulation modelling to examine the potential impact of vaping on smoking prevalence and deaths caused by smoking in England. It uses the well-established 'SimSmoke' model which has been applied in a number of countries. The researchers compared recorded changes in smoking rates in England between 2012-2019 with a scenario where nicotine vaping products (NVPs) were not available. The SimSmoke model had been previously validated in England prior to the growth in e-cigarette use, and this was projected forward as a post 2012 'counterfactual' compared with data from three real world surveys that showed what happened in practice with smoking rates between 2012 to 2019, a period when past 30 day use of vaping products among smokers and recent ex-smokers rose from 3% to 18%.

The study estimated a reduction in adult smoking prevalence due to vaping of 20.2% for males and 20.4% for females using the largest available survey (ONS's Adult Population Survey) compared with the SimSmoke counterfactual, with reductions being higher for younger adults (aged 18-24). For smoking-attributable deaths, the authors estimated that overall just under 166,000 deaths would be avoided up to 2052. This suggests that vaping played a potentially important role in reducing smoking in England when added to other tobacco control policies in place or introduced during the study period up to 2019.

Our third study examines differences between ethnic groups in cutting down smoking or temporary abstinence using e-cigarettes or nicotine replacement therapy (NRT). Although smoking reduction and temporary abstinence do not by themselves confer direct health benefits, NRT has been licensed for both since 2009 as studies have found that those that cut down using NRT are more likely to go on to stop smoking in the longer term. Population level evidence is also emerging that the same may be true for e-cigarettes. However, little research has examined any association between ethnicity and cutting down/temporary abstinence with either product so that is what the researchers set out to explore in this study. They analysed data collected from just over 24,000 smokers taking part in the Smoking Toolkit study in England from 2013 to 2019.

Participants were asked which, if any, of the following were they currently using to cut down smoking or 'use in situations where you are not allowed to smoke' and then provided with response options for a range of NRT products (gum, patch etc) or e-cigarettes. Ethnicity was recorded based on questions in the 2011 census, and a variety of other socio-demographic and smoking behaviour questions were also included. Overall, 18% of smokers reported using e-cigarettes for cutting down and/or temporary abstinence and 9.2% NRT. Vaping for these purposes was less common among people who reported Asian or Arab/other ethnicity compared to those of White ethnicity (21% lower for Asian groups and 42% lower for those of Arab/other ethnicity), and higher among those with mixed/multiple ethnicity (by 42%). The study also looked at changes over time which were not significant for any ethnic group for either NRT or e-cigarettes except those of White ethnicity. For this group there was a decline in NRT use for cutting down/temporary abstinence from 2013 to

2015, then a levelling off and a further small decline 2018-2019. For vaping there was an increase up to 2015 and then a steady decline. The authors point to the fact that ethnic minority groups are at a higher risk of a number of smoking-related diseases. They point to a need for better means of support for these groups to encourage smoking reduction (with a view to longer term cessation) as part of efforts to reduce smoking-related inequalities in health.

This month's final article reports findings from a systematic review of qualitative studies examining adolescent views of e-cigarettes. It employed meta-ethnography, which is a way of synthesising findings across qualitative studies to examine key themes and issues. Thirteen studies met the review's inclusion criteria, and these were from the USA (8), UK (4) Canada (1). All but two involved focus groups and included a mix of smokers and non-smokers as well as varying experience of e-cigarettes (from none to regular use). The researchers were particularly interested in social norms around vaping focusing on different elements of approval or disapproval.

The authors identified four overarching themes relating to e-cigarette uptake and practices: understandings of addiction; perceptions of harms from vaping; the perceptions of parents; and of peers. Norms were coded as either descriptive (awareness of an issue but no clear approval or disapproval) or injunctive (identifiable reasons why participants were approving or disapproving of e-cigarettes). Overall, the review found that e-cigarette use by young people was not necessarily driven by descriptive norms, i.e. understanding relative or absolute harms of smoking and vaping. Instead injunctive norms played a larger part, in particular peer and parental approval which could be positive or negative depending on the context and whether it related to any use or use as an alternative to smoking. Because the studies involved young people and young adults with different smoking/vaping statuses, it was difficult to separate out different norms for specific groups. Differences between studies conducted in the three different countries were also not clear, although varying policy contexts were relevant, and the authors suggest that policy makers should consider the importance of normative processes to young people when considering regulatory approaches to vaping.

Other studies from March/April you might find of interest:

Patterns of use

Sources of flavoured e-cigarettes among California youth and young adults: associations with local flavoured tobacco sales restrictions.

Association of Attention-Deficit/Hyperactivity Disorder With E-Cigarette Use.

Alcohol and other drug health-care providers and their client's perceptions of e-cigarette use, safety and harm reduction.

E-cigarette use and combustible tobacco cigarette smoking uptake among non-smokers, including relapse in former smokers: umbrella review, systematic review and meta-analysis.

Nicotine delivery and cigarette equivalents from vaping a JUULpod.

Validating E-cigarette Dependence Scales Based on Dynamic Patterns of Vaping Behaviors.

Nicotine Dependence in Dual Users of Cigarettes and E-Cigarettes: Common and Distinct Elements.

Associated Changes in E-cigarette Puff Duration and Cigarettes Smoked per Day.

Harsh and Sweet Sensations Predict Acute Liking of Electronic Cigarettes, but Flavor Does Not Affect Acute Nicotine Intake: A Pilot Laboratory Study in Men.

Gender Differences in Reasons for Using Electronic Cigarettes and Product Characteristics: Findings From the 2018 ITC Four Country Smoking and Vaping Survey.

Differences between ethnic groups in self-reported use of e-cigarettes and nicotine replacement therapy for cutting down and temporary abstinence: a cross-sectional population-level survey in England.

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

Trends in frequency of e-cigarette use among cancer patients and survivors in the United States, 2014-2018.

Stressful life events and electronic cigarette use during pregnancy.

Changes in puffing topography and subjective effects over a 2-week period in e-cigarette naive smokers: Effects of device type and nicotine concentrations.

Cross-Sectional Associations of Smoking and E-cigarette Use with Self-Reported Diagnosed Hypertension: Findings from Wave 3 of the Population Assessment of Tobacco and Health Study.

Binge Drinking Moderates the Association Between Chronic Lung Disease and E-Cigarette Use.

Dual Use of Electronic Cigarettes and Traditional Cigarettes Among Adults: Psychosocial Correlates and Associated Respiratory Symptoms.

Relations among sweet taste preference, body mass index, and use of E-cigarettes for weight control motives in young adults.

Both non-smoking youth and smoking adults like sweet and minty e-liquid flavors more than tobacco flavor.

Correlates of e-cigarette use among active duty US military personnel: implications for cessation policy.

Electronic cigarettes in standard smoking cessation treatment by tobacco counselors in Flanders: E-cigarette users show similar if not higher quit rates as those using commonly recommended smoking cessation aids.

E-liquid purchase as a function of workplace restriction in the experimental tobacco marketplace.

Awareness and prevalence of e-cigarette use among Chinese adults: policy implications.

Systematic Review of Electronic Cigarette Use (Vaping) and Mental Health Comorbidity Among Adolescents and Young Adults.

E-Cigarette Demand: Impact of Commodity Definitions and Test-Retest Reliability.

E-cigarettes use prior to smoking combustible cigarettes among dual users: The roles of social anxiety and E-cigarette outcome expectancies.

E-cigarette use is associated with subsequent cigarette use among young adult non-smokers, over and above a range of antecedent risk factors: a propensity score analysis.

The impact of flavored ENDS use among adolescents on daily use occasions and number of puffs, and next day intentions and willingness to vape.

Pregnant women's use of e-cigarettes in the UK: a cross-sectional survey.

Perception

Perceptions of e-cigarettes among smokers and non-smokers in households with children in rural China: A cross-sectional study.

Electronic nicotine delivery systems: use, knowledge, and attitudes among diverse college students.

Does the content and source credibility of health and risk messages related to nicotine vaping products have an impact on harm perception and behavioural intentions? A systematic review.

Flavor and product messaging are the two most important drivers of electronic cigarette selection in a choice-based task.

Adolescent electronic cigarette counselling: knowledge, attitudes and perceived barriers among clinical staff in a primary care setting.

Electronic cigarette use and perceptions amongst UK medical students: A cross-sectional study.

Motivations and methods of dual users to quit vaping: Survey findings from adults who use electronic and combustible cigarettes.

Healthcare Professionals' Beliefs, Attitudes, Knowledge, and Behavior Around Vaping in Pregnancy and Postpartum: A Qualitative Study.

Cessation

Interest in Quitting e-Cigarettes Among Adult e-Cigarette Users With and Without Cigarette Smoking History.

Vape Shop Employees: Do They Act as Smoking Cessation Counselors?

Patterns of E-cigarette Use and Subsequent Cigarette Smoking Cessation Over 2 Years (2013/2014-2015/2016) in the Population Assessment of Tobacco and Health Study.

Effectiveness of Electronic Cigarettes in Smoking Cessation: A Systematic Review and Meta-analysis.

A Single-Arm, Open-Label, Pilot, and Feasibility Study of a High Nicotine Strength E-Cigarette Intervention for Smoking Cessation or Reduction for People With Schizophrenia Spectrum Disorders Who Smoke Cigarettes.

A systematic review of randomized controlled trials and network meta-analysis of e-cigarettes for smoking cessation.

The effectiveness of using e-cigarettes for quitting smoking compared to other cessation methods among adults in the United Kingdom.

Smoking cessation in individuals who use vaping as compared with traditional nicotine replacement therapies: a systematic review and meta-analysis.

Intensive Longitudinal Study of the Relationship Between Cigalike E-cigarette Use and Cigarette Smoking Among Adult Cigarette Smokers Without Immediate Plans to Quit Smoking.

England SimSmoke: the impact of nicotine vaping on smoking prevalence and smoking-attributable deaths in England.

Youth

Trends and Patterns of Tobacco and Nicotine Product Use Among Youth in Canada, England, and the United States From 2017 to 2019.

Assessing the Social Influences, Self-Esteem, and Stress of High School Students Who Vape.

Adolescent's Health Perceptions of E-Cigarettes: A Systematic Review.

Youth use of e-cigarettes: Does dependence vary by device type?

The emerging norms of e-cigarette use among adolescents: A meta-ethnography of qualitative evidence.

Effects of Social Media on Adolescents' Willingness and Intention to Use E-Cigarettes: An Experimental Investigation.

Social media and E-cigarette use among US youth: Longitudinal evidence on the role of online advertisement exposure and risk perception.

Combustible and electronic cigarette use and insufficient sleep among U.S. high school students.

High-School Students Rarely Use E-Cigarettes Alone: A Sociodemographic Analysis of Polysubstance Use Among Adolescents in the United States.

Youth Vaping and Tobacco Use in Context in the United States: Results From the 2018 National Youth Tobacco Survey.

Do Parents Still Matter? The Impact of Parents and Peers on Adolescent Electronic Cigarette Use.

Marketing

Exposure to E-Cigarette Product Placement in Music Videos Is Associated With Vaping Among Young Adults.

Circumvention of COVID-19-related restrictions on tobacco sales by the e-cigarette industry in South Africa and comparative analyses of heated tobacco product vs combustible cigarette volume sales during 2018-2020.

Influence of online comments on smokers' E-cigarette attitude: Opinion climate, review fraud, and resistance to persuasion.

The impact of varying warning color on e-cigarette advertisements: Results from an online experiment among young adults.

Harms and harm reduction

Harm reduction associated with dual use of cigarettes and e-cigarettes in Black and Latino smokers: Secondary analyses from a randomized controlled e-cigarette switching trial.

E-cigarette Vape and Lung ACE2 Expression: Implications for coronavirus vulnerability.

Differential responses to e-cig generated aerosols from humectants and different forms of nicotine in epithelial cells from non-smokers and smokers.

The Immediate Physiological Effects of E-Cigarette Use and Exposure to Secondhand E-Cigarette Vapor.

Pilot Study to Detect Genes Involved in DNA Damage and Cancer in Humans: Potential Biomarkers of Exposure to E-Cigarette Aerosols.

Reducing the smoking-related health burden in the USA through diversion to electronic cigarettes: a system dynamics simulation study.

A Magic Bullet? The Potential Impact of E-Cigarettes on the Toll of Cigarette Smoking.

The in vitro ToxTracker and Aneugen Clastogen Evaluation extension assay as a tool in the assessment of relative genotoxic potential of e-liquids and their aerosols.

The Cardiovascular Effects of Electronic Cigarettes.

E-cigarette users are associated with asthma disease: A meta-analysis.Electronic Cigarette Aerosol Is Cytotoxic and Increases ACE2 Expression on Human Airway Epithelial Cells: Implications for SARS-CoV-2 (COVID-19).

Association of electronic cigarette exposure with serum uric acid level and hyperuricemia: 2016-2017 Korea National Health and Nutritional Examination Survey.

Refill liquids for electronic cigarettes display peculiar toxicity on human endothelial cells.

Impact of cigarette versus electronic cigarette aerosol conditioned media on aortic endothelial cells in a microfluidic cardiovascular model.

DNA methylation differentiates smoking from vaping and non-combustible tobacco use.

Sex dependent effect of maternal e-nicotine on F1 Drosophila development and airways.

Nicotine e-cigarette vapor inhalation and self-administration in a rodent model: Sex- and nicotine delivery-specific effects on metabolism and behavior.

Long-Term Electronic Cigarette Exposure Induces Cardiovascular Dysfunction Similar to Tobacco Cigarettes: Role of Nicotine and Exposure Duration.

Exposure to Nicotine and Toxicants Among Dual Users of Tobacco Cigarettes and E-Cigarettes: Population Assessment of Tobacco and Health (PATH) Study, 2013-2014.

Misc

Understanding commercial actors' engagement in policy debates on proposed e-cigarette regulation in Scotland.

Development and validation of a gas chromatography method coupled with flame ionization detector for quantitative analysis of fragrance allergens in aromas for e-cigarettes.

Acute and subacute inhalation toxicity assessment of WS-23 in Sprague-Dawley rats.

Design features and elemental/metal analysis of the atomizers in pod-style electronic cigarettes.

Retrospective review of nicotine exposures in California from 2012 to 2018 and analysis of the impacts of e-cigarette regulations.

Characterising vaping products in the United Kingdom: an analysis of Tobacco Products Directive notification data.

Google shopping queries for vaping products, JUUL and IQOS during the E-cigarette, or Vaping, product use Associated Lung Injury (EVALI) outbreak.

Initial Views and Experiences of Vaping in Prisons: A Qualitative Study With People in Custody Preparing for the Imminent Implementation of Scotland's Prison Smokefree Policy.

Associations between vaping and Covid-19: Cross-sectional findings from the HEBECO study.

Search strategy

The Pubmed database is searched in the middle of each month, for the previous month using the following search terms: e-cigarette*[title/abstract] OR electronic cigarette*[title/abstract] OR ecig[title/abstract] OR (nicotine AND (vaporizer OR vaping OR vapourizer OR vaporiser OR vapouriser))

Based on the titles and abstracts new studies on e-cigarettes that may be relevant to health, the UK and the UKECRF key questions are identified. Only peer-reviewed primary studies and systematic reviews are included – commentaries will not be included. Please note studies funded by the tobacco industry will be excluded.

This briefing is produced by Alice Davies from Cancer Research UK with assistance from Professor Linda Bauld at the University of Edinburgh and the UK Centre for Tobacco and Alcohol Studies, primarily for the benefit of attendees of the CRUK & PHE UK E-Cigarette Research Forum. If you wish to circulate to external parties, do not make any alterations to the contents and provide a full acknowledgement. Kindly note Cancer Research UK cannot be responsible for the contents once externally circulated.