

Cancer Research UK Briefing: Electronic Cigarettes

Policy Position Summary

Cancer Research UK is determined to reduce deaths from smoking-related cancers and supports measures to help people quit. Evidence so far indicates electronic cigarettes (e-cigarettes) are far less harmful than tobacco and may help smokers to cut down or stop smoking. A balanced approach is needed towards e-cigarettes – one that maximises their potential to help people stop smoking, whilst minimising the risks of unintended consequences that could promote smoking.

Regulation and safety of e-cigarettes

It is important that regulation does not stifle the development of e-cigarettes or make accessing these products more difficult for smokers. The revised EU Tobacco Products Directive has introduced the regulation of e-cigarettes' contents, capacity and promotion, and requires products that make cessation aid claims to be licensed as medicines. We recognise there are risks inherent in this dual track approach for e-cigarette regulation but welcome progress towards ensuring these products are safer, more effective, and readily accessible to smokers. We support light-touch MHRA licensing of e-cigarettes making cessation claims as it will provide a system for assessing the products and evidence supporting their claim, and for tracking adverse reactions.

Preventing e-cigarette use among children

It is important that adequate protections exist to stop the promotion of e-cigarettes to young people. Cancer Research UK will continue to monitor the use of e-cigarettes in young people, and assess whether the marketing regulations implemented through the Tobacco Products Directive sufficiently protect youth. We also welcome the Government's ban of the sale of nicotine-containing products such as e-cigarettes to under-18s.

The use of e-cigarettes indoors

Based on the evidence currently available, we do not believe there is justification for an indoor ban on e-cigarettes, either on the basis of potential harm to bystanders from second-hand vapour or that they renormalize smoking tobacco. E-cigarette vapour can contain toxicants; however, this is usually at levels which are far lower than those found in tobacco cigarettes and there is no convincing evidence demonstrating actual harm to bystanders. Unnecessary regulation risks sending the message that e-cigarettes are as harmful as tobacco and this could deter the use of e-cigarettes as a quitting aid.

Tobacco industry involvement

Article 5.3 of the WHO Framework Convention on Tobacco Control (FCTC) seeks to protect public health policy from interference by vested interests. It is critically important that the tobacco industry's investment in the e-cigarette market does not provide them with an opportunity to gain such influence.

Our research into e-cigarettes

We believe more evidence is needed on the impact of e-cigarettes to help inform smokers and policy-makers looking to reduce the harm from tobacco. This is why we are increasing our investment in e-cigarette research, promoting the development of a prioritised research agenda, and facilitating information sharing within the research community through the UK Electronic Cigarette Research Forum.

Background

Electronic cigarettes, or e-cigarettes, are devices that allow users to inhale vaporised nicotine dissolved in propylene glycol or glycerine. Unlike traditional cigarettes, they do not contain tobacco. Approximately 2.9 million adults, or 6% of the adult population, currently use e-cigarettes in Great Britain.¹ Regular use of e-cigarettes is almost entirely confined to current and ex-smokers. Regular use by non-smokers and young people remains very rare. In 2017, for the first time ever, there were more ex-smokers (1.5 million) who use e-cigarettes than current smokers (1.3 million). Over half (52%) of e-cigarette users are now ex-smokers and 45% are smokers.² A recent Cancer Research UK-funded study suggested that e-cigarettes may have contributed to an additional 18,000 long-term ex-smokers in England in 2015.³

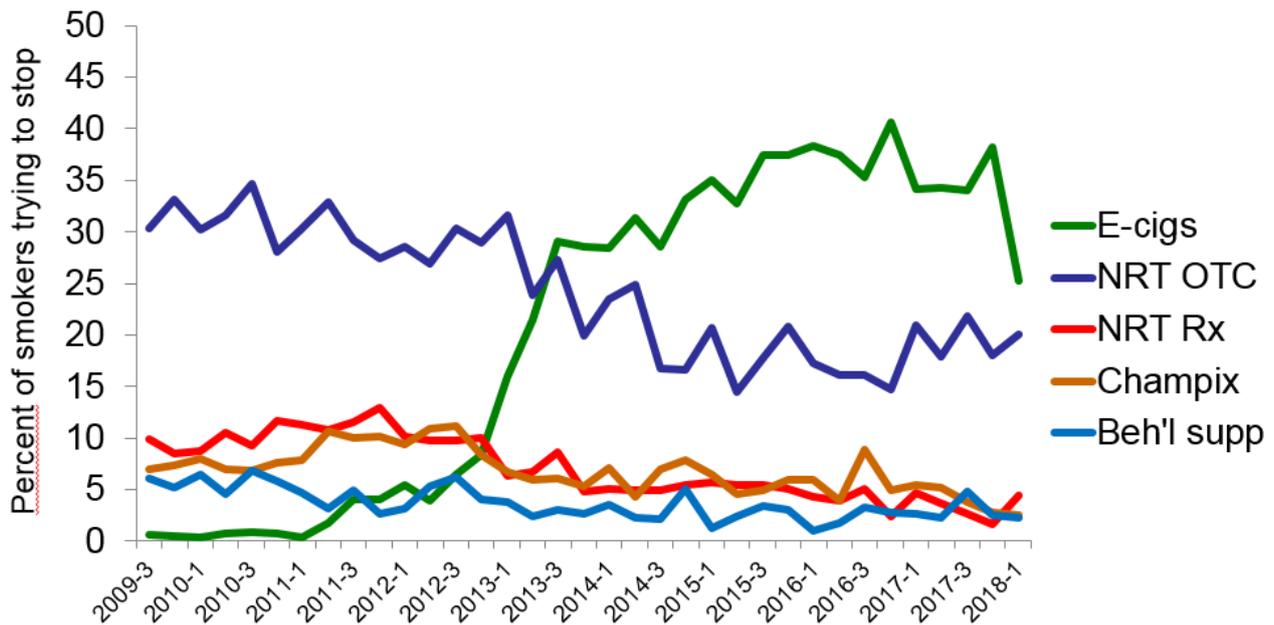
The first generation of e-cigarettes (sometimes called ‘cig-a-likes’) are products designed to look like traditional tobacco cigarettes and carry a glowing LED tip at the end. The majority of this market is owned by the Tobacco Industry.⁴ There is now far greater use of second and third generation ‘vapours, tanks and mods (VTMs)’ e-cigarettes, which can be refilled by the owner. Many second and third generation models also allow for the power to be adjusted, which can affect nicotine delivery. The majority of this market is owned by independents.

The main reason smokers (dual users) and ex-smokers (only e-cigarette users) report having used e-cigarettes is to “help me reduce the amount of tobacco I smoke, but not stop completely” (dual users) or to “help me stop smoking entirely” (ex-smokers); followed by “to save money compared with smoking.”¹ This reflects the results of the Smoking Toolkit Study, which shows a rise in the number of smokers using e-cigarettes in quit attempts, which has since shown signs of plateauing (see Figure 1).⁵ The reasons for this more recent decline are not yet clear, and we don’t know whether or not this could be reflecting a longer-term trend.

While nicotine is addictive, and not entirely harmless, e-cigarettes do not contain the extensive cocktail of cancer-causing chemicals found in combustible tobacco.⁶ While the long-term health consequences of e-cigarette use are uncertain, the evidence so far suggests that e-cigarettes are far less harmful than smoking.^{7 8} Evidence to date indicates they are far less harmful than tobacco cigarettes^{9 10 11 12} given that tobacco is associated with more than one in four cancer deaths in the UK.¹³ There is also growing evidence to suggest that e-cigarettes can work successfully as an aid to cessation.^{14 15 16}

However, as a relatively new product, there remains uncertainty as to how effective they are in helping people quit smoking, the long-term health consequences of their use and their impact on youth behaviour and attitudes to smoking more widely. Cancer Research UK is committed to building the evidence base to help inform smokers and policy-makers looking to reduce the harm from tobacco.

Figure 1: Aids used in most recent quit attempt (n=13754)¹⁷



Safety

There are a range of e-cigarette products available on the market, but the quality and safety varies within and between brands.¹⁸ Cancer Research UK believes that regulation is needed to improve the safety of all e-cigarettes. An independent review commissioned by Public Health England and endorsed by the Royal College of Physicians estimate e-cigarettes are around 95% safer than tobacco cigarettes and may help smokers to cut down or stop smoking.^{19 20 21 22} The authors also noted that there is insufficient evidence that e-cigarettes renormalise smoking or act as a gateway to smoking.

The levels of toxicants found in e-cigarette vapour are generally substantially lower than those found in tobacco cigarette smoke.²³ However, the health implications of long-term exposure to nicotine and propylene glycol/glycerine, the main chemicals in e-cigarette vapour, are not fully understood.²⁴ There is also some evidence that suggests that nicotine may promote tumour growth in animals^{25 26 27} and in human cells.²⁸ There have been mixed results in early stage data as to whether e-cigarette vapour could be toxic to human cells, and how this compares to typical usage. There is also variation in toxicity across different devices, flavourings and voltages used.^{29 30 31 32 33} Although the evidence as a whole points to e-cigarettes being far less harmful than tobacco, toxicity research should be closely monitored and considered in product regulation where appropriate.

Regulation

The revised EU Tobacco Products Directive (TPD) was transposed into UK law on May 20th, 2016, and created a dual-track approach for regulating e-cigarettes. E-cigarettes that make smoking cessation claims must be licensed as medicines by the Medicines and Healthcare products Regulatory Agency (MHRA). All other e-cigarettes are regulated as consumer products and must adhere to the regulations set out by the TPD.

The following regulations, set out by the TPD, apply to all e-cigarettes not licensed as medicines:

- Introduce a size limit for e-liquids of 10ml for dedicated refill containers and 2ml for disposable e-cigarettes, cartridges and tanks
- Require products to be child and tamper proof.
- Require the pack to include a health warning covering 30% of the surfaces of the unit packet and any outside packaging stating 'This product contains nicotine which is a highly addictive substance.'
- Require instructions for use, information on addictiveness and toxicity on the packaging and accompanying information leaflet.
- Ban certain promotional and misleading descriptors on packaging.
- Ensure that all substances contained in the product and information on the product's nicotine content are declared on the label.
- Require manufacturers to inform Member States before placing new or modified products on the market and notify a range of product information concerning composition, emissions and sales/marketing data.
- Introduce a registration scheme for businesses engaged in cross-border distance sales of e-cigarette products.
- Prohibit the advertising or promotion, directly or indirectly, of electronic cigarettes and re-fill containers on a number of media platforms, including on television, radio, newspapers and magazines.

EU member states have the power to regulate flavours of e-cigarettes if they have justified grounds for doing so. Member states also have the power to ban an e-cigarette product if they can show it is a proportionate response and they have justified grounds to believe that the product is harmful to humans. If they take this option they must inform the EU Commission immediately. If three member states undertake this action, then the Commission has the power to ban the specified product across the EU.

Preventing e-cigarette use among children

Uptake of e-cigarettes by children is of concern because nicotine use in adolescence may cause lasting adverse consequences for brain development.³⁴ There is also concern that the use of e-cigarettes may renormalize the use of tobacco among children, but there is insufficient evidence to support this view.

Currently, there is little evidence that children are using e-cigarettes in great numbers. In particular, among children aged 11-16 who have never smoked, only between 0 and 1% of children surveyed use an e-cigarette more than once a week in the United Kingdom.³⁵ This coincides with the continuing decline in youth smoking. However, this is subject to regional variation with some areas showing evidence of higher use.

Arguments about renormalisation and e-cigarettes being a gateway to taking up smoking are not based on strong evidence. In 2018, Cancer Research UK funded a study that looked at whether any association between e-cigarette use and future smoking in young people could be causal. But this study was unable to draw firm conclusions on a causal relationship, in part because it could not control for many of the possible mediating factors in this relationship.³⁶

E-cigarette use in areas covered by Smoke Free Legislation

Cancer Research UK believes there is insufficient evidence to support a blanket indoor ban on e-cigarette use, either on the basis of renormalisation of smoking or harm to bystanders from second-hand vapour.

The Smokefree Legislation has not only helped reduce the public's exposure to the harm caused by second-hand smoke³⁷, it is also encouraging people to quit³⁸, and reducing children's exposure to a deadly habit.³⁹ The main reason for the introduction of the Smokefree Legislation was to protect people from the harms of second-hand smoke.

In the UK, around 11,000 people die of diseases caused by toxicants in second-hand tobacco smoke every year⁴⁰. Although sidestream tobacco smoke is about four times more toxic than mainstream tobacco smoke⁴¹, it is inhaled by others in a more diluted form so tobacco smoke is not as harmful to bystanders as it is to the smoker. E-cigarettes do not use combustion and there is no sidestream vapour so the only source of second-hand vapour is that exhaled by the user. The relatively limited evidence to date suggests toxicants may be present but mostly at much lower levels in second-hand e-cigarette vapour than second-hand cigarette smoke^{42 43 44 45 46}. The relative harm to both users and bystanders from second-hand vapour is likely to be much lower than that of tobacco.

Like tobacco cigarettes, e-cigarette vapour has also been shown to include 'particulate matter'.⁴⁷ This is a 'catch-all' term for small particles of a variety of substances and small particulate matter (PM2.5) has been classified as an IARC Group 1 carcinogen.⁴⁸ More studies are needed to understand the impact of exposure of e-cigarette vapour particularly in the long term, both for users and bystanders.

A review of the impact of e-cigarettes noted that passive exposure to the aerosol can expose non-users to nicotine but according to the author "pollutant levels are much lower than from cigarettes and are likely to pose a much lower risk (if any) compared to cigarettes"^{49 50}. The additional in the Tobacco Products Directive, which came into force in May 2017, offer further safeguards concerning the contents and mechanisms of e-cigarettes.⁵¹

In the UK, it is not illegal to use e-cigarettes in enclosed public spaces. However, this remains an issue of contentious policy debate. Organisations including the World Health Organisation have recommended banning the use of e-cigarettes indoors on the basis that bystanders expect no risk increase from any product in the air they breathe.⁵² The Welsh Government came very close to implementing a ban on e-cigarette use in public places, but this bill was voted down at the final stage. Currently, there are no plans to support a similar measure in the rest of the UK, though in Scotland most health boards have banned them on hospital grounds.⁵³

Some businesses have chosen to ban the use of e-cigarettes rather than ask staff to differentiate when enforcing Smokefree Legislation. Businesses should make reasoned decisions on whether to allow the use of e-cigarettes in their premises based on the best available information, whilst continuing to maintain the integrity of Smokefree Legislation. Public Health England has developed guidance to assist businesses in creating a policy around e-cigarettes in public places and workplaces.⁵⁴ The guidance advises that businesses must clearly make a distinction between smoking and vaping, protecting young people while supporting smokers to stop smoking tobacco.

According to ASH data, we are seeing rising numbers of smokers who perceive e-cigarettes to be as or more harmful than tobacco⁵⁵. Between 2013 and 2017 the number of people who wrongly assume they are more or equally as harmful has increased from 7% to 26%. Conflating tobacco and e-cigarettes under the same legislation could increase this confusion and risks dissuading smokers from moving away from tobacco.

Unless we start to see rising youth smoking rates, rising regular e-cigarette use among 'never smokers,' or any convincing evidence for harm to bystanders, it is difficult to justify a blanket ban on e-cigarette use in indoor public places.

It is important that adequate protections are put in place to stop the promotion of e-cigarettes to young people and prevent those under-18 from purchasing them. We are pleased by the UK Government's decisions to ban those under the age of 18 from buying e-cigarettes, and the 'proxy' purchasing of e-cigarettes for under 18s, which came into effect in 2015.

E-cigarette marketing

Cancer Research UK believes a balanced approach should be taken towards the marketing of e-cigarettes. Smokers should have access to high-quality information to help them to make informed choices, but marketing should not be aimed at youth or non-smokers. We support the new TPD regulations for e-cigarettes and do not believe there is any justification for additional marketing regulations to be implemented. We will continue to monitor and evaluate the impact of marketing on smokers, non-smokers and youth.

Cancer Research UK published a report written by experts at Stirling University on the marketing of e-cigarettes in October 2016.⁵⁶ The report updates a previous literature review on e-cigarette marketing and gives an overview of past and current marketing regulations, with input from key stakeholders. It identifies key research questions, including the need to monitor the impact of the TPD regulations. We will continue to prioritise research on e-cigarette marketing and aim to answer key questions outlined in this report.

In May 2016, Article 20 of the TPD was transposed to law and created further restrictions for the marketing of e-cigarettes. More details of these restrictions are outlined above in the regulation section. The Directive allows member states to pursue further regulation for domestic advertising of e-cigarettes. England will not go further than the regulation set out by the TPD, but Scotland is currently consulting on further e-cigarette advertising regulations.

Quitting and harm reduction through e-cigarettes

Smoking is the largest preventable cause of cancer in the world and accounts for 3 in 20 (15%) cancer cases in the UK.⁵⁷ Cancer Research UK encourages those who smoke to quit entirely. A range of cessation services and approaches are available to help smokers quit. Using prescription medication and behavioural support from free Stop Smoking Services is the most effective way to quit, increasing the chances of stopping smoking completely by around three times.⁵⁸

The randomised controlled trials conducted so far suggest a potential benefit for e-cigarettes for smoking cessation, but more evidence is needed to confirm this.⁵⁹ The latest Cochrane Review on e-cigarettes and cessation has concluded that using an e-cigarette containing nicotine increases the chances of stopping smoking in the long term compared to using an e-cigarette without nicotine.⁶⁰ Another recent analysis of population trends in England showed a positive association between the use of e-cigarettes and the success rate of quit attempts. This study suggested that e-cigarettes may have contributed to an additional 18,000 long-term ex-smokers in England in 2015.⁶¹ This compares to the number of successful quits (self-reported) through NHS England Stop Smoking Services of almost 156,000 between April 2016 and March 2017.⁶²

The effectiveness of nicotine delivery of e-cigarettes is unclear given that it varies across products and user behaviour. Studies have revealed the inconsistency of nicotine delivery⁶³, and research shows that nicotine levels in e-cigarette liquids do not necessarily reflect nicotine levels in the vapour.⁶⁴ Evidence indicates that vapers may be able to control the amount of nicotine they get from an e-cigarette.⁶⁵ This means different users may absorb different levels of nicotine at different rates, making it more difficult to quantify the

effectiveness of e-cigarettes as a quit aid. However, this level of control enables vapers to get the level of nicotine they need from an e-cigarette, and some devices have been shown to be able to sustain venous blood levels comparable with those expected in smokers.¹⁰

While quitting is always the best option, harm reduction approaches for those who don't want to quit, whereby smokers reduce their tobacco intake, can provide long-term benefit as the likelihood of subsequently quitting may increase. In 2013, the National Institute for Health and Care Excellence (NICE) developed guidance on a harm reduction approach to smoking, supporting the use of licensed nicotine-containing products to help smokers cut down, for temporary abstinence and as a substitute for smoking.⁶⁶

Evidence suggests that longer-term dual use of e-cigarettes with cigarettes doesn't lead to substantially reduced levels of certain carcinogens and toxins compared to smoking, unlike people who have successfully switched to e-cigarettes only.⁶⁷ But it is suggested that e-cigarettes could play a role in harm reduction if they can deliver nicotine and support cutting down and eventually quitting in a similar way as currently licensed NRT. However, dual use of e-cigarettes alongside tobacco cigarettes could, alternatively, potentially fuel nicotine addiction. E-cigarettes may allow smokers to get a nicotine hit where they are currently unable to smoke (for example, where smoking is banned by Smoke free Legislation) and discourage quitting. There is currently not enough evidence to say which of these scenarios is more likely.

More evidence is needed to help inform smokers to make choices about e-cigarettes as a potential quit aid. We support the light-touch MHRA licensing of e-cigarettes as it provides a system for assessing the products and evidence supporting their claims, and for tracking adverse reactions.

Tobacco industry involvement

It is a growing concern that the tobacco industry is investing in e-cigarettes. Cancer Research UK calls for the strongest possible measures to restrict tobacco companies marketing their deadly tobacco products, and the protection of public health policy from their influence.

The World Health Organisation's Framework Convention on Tobacco Control (FCTC) Article 5.3 states that Governments must protect health policy from the vested interests of the tobacco industry.⁶⁸ This global agreement recognises the fundamental and irreconcilable conflict between the tobacco industry's interests and public health policy interests.⁶⁹ This reflects the industry's history in blocking, amending and delaying public health legislation.⁷⁰

There has been substantial investment in e-cigarettes in the UK and globally over the last several years. British American Tobacco (BAT) has produced both 'e-Voke' which obtained an MHRA license in November 2015⁷¹, and 'Vype' which is a line of e-cigarette products being promoted as consumer products.⁷² In addition, Phillip Morris International (PMI) have purchased 'Nicolites', Japan Tobacco International (JTI) has purchased 'E-lites'⁷³ and 'blu E-cigs' was sold to Imperial Tobacco in 2014⁷⁴.

Under the regulations set out by the TPD, the tobacco industry are in a position to both promote some lines of e-cigarette products as consumer products, "alternatives" to smoking including as options for continuing dual use, and other lines as cessation aids, part of the solution to smoking. It has been argued given their past involvement in the harm reduction debate that their control of the e-cigarette market would serve to maintain the dominance of the traditional cigarette.⁷⁵

Research has suggested that the tobacco industry's past involvement in harm reduction was used as a tactical adaptation to policy change (through taking over the market of 'less harmful' methods of tobacco

use to eliminate competition with cigarettes), rather than a genuine commitment to reducing harm.⁷⁶ Given their past involvement in the harm reduction debate, their control of the e-cigarette market could serve to maintain the dominance of the traditional cigarette. It is crucial that the integrity of Article 5.3 of the FCTC be maintained, and the tobacco industry's involvement in the e-cigarette market does not provide them with an opportunity to participate as a stakeholder in public health and influence health policy.

Cancer Research UK's investment in e-cigarette research

To help answer the many outstanding questions on e-cigarettes, CRUK is increasing its investment in e-cigarette research. This will be focused on answering questions on the long-term impact of e-cigarette use, understanding how they might help people to quit and the wider consequences of e-cigarette use particularly among young people.

Cancer Research UK, in partnership with Public Health England, has established the UK Electronic Cigarette Research Forum (UKECRF) to bring together researchers and experts to explore the questions and issues that emerge from new e-cigarette research.

Cancer Research UK recognises that e-cigarettes may help smokers quit or cut down the amount they smoke. With further research we hope to be better able to assess their effectiveness as quit aids and their long-term impact on health. To ensure that the impact of e-cigarettes is entirely positive we are also mindful of potential unintended consequences. We welcome the ban on the sale of e-cigarettes to under-18s and call for the enforcement of comprehensive marketing regulation to prevent e-cigarettes appealing to non-smokers and young people. We don't support regulation which isn't backed by the evidence such as legislation to ban their use indoors. In addition, we must ensure that the tobacco industry does not use e-cigarettes as a means to become a stakeholder in public health. We believe that this approach will help maximise the potential for e-cigarettes to help reduce the number of people smoking.

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