Written evidence submitted by Cancer Research UK (ECG0057)

About Cancer Research UK¹

1. Every year around 300,000 people are diagnosed with cancer in the UK and more than 150,000 people die from cancer. Cancer Research UK is the world’s leading cancer charity dedicated to saving lives through research. The charity’s pioneering work has been at the heart of the progress that has already seen cancer survival in the UK double in the last forty years. Last year, we spent £432 million on research in institutes, hospitals and universities across the UK, funding over 4,000 researchers, clinicians and nurses. We receive no funding from the Government for our research. Our ambition is to accelerate progress to see three in four patients survive cancer by 2034.

2. We are a leading organisation in the UK on e-cigarette research and policy development. We are investing £5 million over 5 years in e-cigarette research, including examining the health effects of the products, their effectiveness as a cessation aid, and the impact of product and marketing regulations. To date we have funded more than 40 studies on e-cigarettes.

Executive Summary:

3. We welcome the opportunity to submit evidence to this inquiry. Evidence so far suggests that e-cigarettes are much less harmful than tobacco cigarettes and may help smokers cut down or quit smoking. A balanced approach is needed towards e-cigarettes – one that maximises their potential to help people stop smoking, while also minimising the risks of unintended consequences that could promote smoking or even harm users’ health. The key points made in this response are summarised below:

3.1. Health – e-cigarettes are almost certainly far safer than smoking, as they do not contain tobacco. The levels of key harmful chemicals are generally significantly lower than those found in tobacco smoke, and evidence suggests that there are limited health impacts to users and people who passively breathe e-cigarette vapour. Long-term data will be needed. There is growing evidence that e-cigarettes can help people stop smoking, and evidence doesn’t suggest that it encourages people to take up smoking.

3.2. Regulation – e-cigarette regulation varies across the EU, with all member states compliant with the Tobacco Products Directive as a baseline. The level of e-cigarette regulation in the UK is less than other European countries and we feel generally adequate, although refinements to advertising and marketing regulations to allow public health organisations to publicise the relative health safety of e-cigarettes compared to tobacco cigarettes would be welcome.

¹ Registered charity in England and Wales (1089464), Scotland (SC041666) and the Isle of Man (1103). Registered as a company limited by guarantee in England & Wales No.4325234. Registered address: Angel Building, 407 St John Street, London EC1V 4AD
On health:

4. The impact on human health of e-cigarettes—themselves and relative to ‘conventional’ smoking—and any gaps in the science knowledge-base in this area.

4.1. The evidence so far shows that e-cigarettes are far less harmful than smoking. This is because they don’t contain tobacco – the single biggest preventable cause of death worldwide – or involve combustion. They do contain nicotine, which is addictive, but isn’t responsible for the major health harms from smoking.

4.2. Initial research on e-cigarette safety came from comparing the levels of toxicants in e-cigarette vapour to those in tobacco smoke. A 2014 systematic review of the available evidence at the time, demonstrated that the levels of exposure to measured harmful chemicals fell well below the thresholds for concern and were, on average, significantly lower than exposures from smoking.

4.3. The existing research, and a study comparing relative harms of nicotine-containing products, led both Public Health England (PHE) and the Royal College of Physicians (RCP) to estimate that e-cigarettes carry around 5% of the harm of smoking. Although this precise figure (which is an estimate) has been disputed, the documents are still clear in the evidence that e-cigarettes are far safer than smoking. Since then, 13 public health bodies have come together to support a joint consensus statement on e-cigarettes, determining that “e-cigarettes are significantly less harmful than smoking”. NHS Health Scotland have written a consensus statement stating, “vaping e-cigarettes is definitely less harmful than smoking tobacco”, and the Royal College of General Practitioners have stated “it is accepted that based on the evidence to date, vaping is a far safer alternative to smoking tobacco”. The British Medical Association (BMA) updated its position on e-cigarettes in November 2017 to recognise that e-cigarettes “have the potential to make an important contribution towards the BMA’s ambition to achieve a tobacco-free society”.

4.4. In terms of studies in people, there is some evidence of safety from adverse event reporting in randomised control trials. A Cochrane review into using e-cigarettes for smoking cessation, performed a meta-analysis on many different papers assessing e-cigarette use in people. None of the included (short term) studies reported any serious adverse events considered possibly related to e-cigarette use. A 2014 systematic review also records a number of trials of several months that demonstrated no serious adverse events from e-cigarette use.

4.5. A 2015 paper showed that e-cigarette users who had stopped smoking for at least two months had significantly lower levels of key toxicants in their urine than smokers. Similarly, a 2016 paper looking at e-cigarette use in humans showed that e-cigarette users had significantly lower exposure to the lung carcinogen NNK, and significantly lower levels of exhaled carbon monoxide. More recently, in 2017, a landmark paper funded by Cancer Research UK demonstrated for the first time in long-term users (who had been using their product for at least six months), that many key toxicants (including known carcinogens) present in smokers’ urine were significantly lower in e-cigarette users. This was only the case for those who switched entirely to e-cigarettes from tobacco, demonstrating the
importance of giving up smoking entirely. Levels in e-cigarette users were also comparable to those who were exclusively using nicotine replacement therapies (NRTs)\textsuperscript{15}.

4.6. Most recently, a paper looking at a very small group of never smokers who were regular users of e-cigarettes demonstrated that there were no significant health impacts after 3.5 years of use. The study looked at measures of vital signs, lung function, respiratory symptoms and airway inflammation. No serious adverse events were recorded, and there were no significant differences between e-cigarette users and non-users\textsuperscript{16}.

4.7. When it comes to harms from passive vaping, the limited evidence shows that e-cigarette vapour contains some toxic chemicals, but generally at much lower levels than cigarette smoke. There is currently no good evidence to show second-hand vapour causes harm to bystanders, unlike second-hand smoke, which is a known carcinogen.\textsuperscript{17,18,19}

4.8. Nicotine delivery via e-cigarettes poses little danger to adults. To prevent accidental poisoning, e-cigarettes and e-liquid should be stored away safely, out of the reach of children, just as is the case with NRT products, household cleaning products and medicines\textsuperscript{20}.

4.9. We still need further evidence from long-term studies to determine the ultimate impact of e-cigarettes on all aspects of health. But the evidence we have so far indicates that e-cigarettes are far less harmful than smoking.

5. The benefits and risks of e-cigarettes as a ‘stop smoking’ tool, any gaps in the knowledge-base on this, and whether any approaches are needed to tackle e-cigarette addiction.

5.1. There is growing evidence to show that e-cigarettes are helping people to stop smoking. A Cochrane Review of the evidence concluded that evidence from two trials demonstrated that e-cigarettes are more likely to help smokers quit than a placebo\textsuperscript{21}. A more recent review on using e-cigarettes for smoking cessation showed that from the four papers that met all the rigorous inclusion criteria, they were consistent in the conclusion that e-cigarettes can help cessation in smokers.\textsuperscript{22}

5.2. A widely cited meta-analysis concluded that e-cigarettes do not help people to stop smoking\textsuperscript{23}. However, this paper has had lots of criticism from researchers in the community\textsuperscript{24}. The key criticisms being:

– There is great heterogeneity across the included studies and the results should not be pooled together.
– There is selection bias in some of the papers, that excludes people who have already stopped smoking.
– The measure of e-cigarette use sometimes includes those who have only tried the products and are not regular users.
– Some studies did not assess whether participants were using their e-cigarette with the purpose of smoking cessation.
– Not all confounders were controlled for, including past quit attempts, meaning the study cannot adjust for those who are more nicotine dependent and would find it hardest to quit.
5.3. It’s also important to take note of wider population studies. A 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\textsuperscript{25}. While another population study demonstrated that e-cigarettes were around 60% more effective than using no aid, or NRT bought over the counter\textsuperscript{26}. A recent paper from the US has also demonstrated that the success of quit attempts was directly related to the frequency of e-cigarette use, with more regular users having a better chance of beating their tobacco addiction\textsuperscript{27}.

5.4. Meanwhile, the latest data from NHS Stop Smoking Services includes figures on the quit success rate for those using unlicensed nicotine-containing products (e-cigarettes) alongside their treatment. These data show that people who used e-cigarettes alongside the behavioural support offered, achieved success rates comparable to more established treatments. While the highest success rate was for those who used licensed medication and an e-cigarette consecutively\textsuperscript{28}.

5.5. It will be helpful to have more data from randomised control trials. At a recent conference, the author of the Cochrane Review on electronic cigarettes for smoking cessation\textsuperscript{29} highlighted 14 upcoming studies that may feature in future meta-analyses\textsuperscript{30}. In the meantime, the evidence is showing that e-cigarettes can be used as an effective tool for smoking cessation, when used properly.

6. The uptake of e-cigarettes among young people and evidence on whether e-cigarettes play a role in ‘re-normalising’ smoking.

6.1. There are some concerns that e-cigarettes could act as a gateway to young people taking up smoking cigarettes, but so far, the evidence does not support this view in the UK. Experimentation with e-cigarettes in never smokers remains low and coincides with the continuing decline in youth smoking\textsuperscript{31}. Public Health England commissioned an independent review endorsed by the Royal College of Physicians (RCP), noting that “there is insufficient evidence that e-cigarettes renormalise smoking or act as a gateway to smoking”\textsuperscript{32}. A new study by the UK Centre for Tobacco and Alcohol Studies, PHE, ASH and DECIPHer Centre at the University of Cardiff found that levels of regular vaping in young people who have never smoked remain very low, showing that the majority of young people who experiment with e-cigarettes don’t go on to use them regularly. The highest rate of regular use of e-cigarettes in young people who had never smoked was 0.5%\textsuperscript{33}.

6.2. There have been UK based studies attempting to assess whether e-cigarette use as an adolescent leads to future smoking. These often show an association between e-cigarette use and smoking, but cannot exclude that those who try e-cigarettes are also likely to try tobacco cigarettes. Although these studies can be useful for tracking nicotine-containing product experimentation, they cannot demonstrate a causal link between e-cigarette use and becoming a regular smoker\textsuperscript{34,35}.

6.3. The current UK legislation prohibits under 18s from buying e-cigarettes or having them bought for them. With this legislation in place, use among never smokers has remained uncommon, and smoking rates have continued to decline\textsuperscript{36}.

On regulation:
7. Whether there is any regulatory variation between the EU and UK, and across UK nations, and
the implications of Brexit on regulation in this area.

7.1. E-cigarette regulation varies across EU member states. EU member states are free to
regulate beyond the Tobacco Products Directive (TPD) – the regulatory baseline for e-
cigarettes and tobacco products – and have done so to varying degrees. This has led to
some variation between some EU member states and the UK. For example, Finland
restricted the sale of flavourings, while the UK Government has not, and has also
committed to not levy excise tax on e-cigarettes or include e-cigarettes in smoke-free
legislation. The UK has generally taken a light-touch approach to regulating e-cigarettes,
with the exception of introducing age of sale regulations.

7.2. There is currently very little variation in e-cigarette regulation across the UK. Age of sale
restrictions are yet to apply in Northern Ireland, although regulations are currently being
introduced. The potential exists for further variation; the Scottish Government has
indicated that it may introduce additional advertising regulations on e-cigarettes.

7.3. We are satisfied that the UK’s approach to implementing the TPD has created an
appropriate regulatory environment and do not wish to see major changes after the UK
exits the EU. We would support a revaluation of specific elements of the TPD relevant to e-
cigarettes, particularly around labelling and product specifications.

8. The effectiveness of regulation on the advertising and marketing of e-cigarettes.

8.1. We believe that the current advertising regulations for e-cigarettes are effective and meet
the aims of providing information to smokers whilst mitigating against unintended
consequences such as promoting uptake among youth or non-smokers.

8.2. There is some scope for refining regulations on e-cigarette advertising, to tackle the
growing perception among the public that e-cigarettes are harmful. The Action on Smoking
and Health (ASH) Smokefree Great Britain Survey found that the proportion of adults
correctly identifying that e-cigarettes are a lot less harmful than smoking fell from 15% to
13% from 2015-16 to 2016-17. In addition, 26% of people thought e-cigarettes were as or
more harmful than smoking, compared to only 7% in 2013.

8.3. Public health organisations ought to be able to run campaigns about the relative safety of e-
cigarettes compared to smoking. These campaigns could educate the public on a new
technology where there is significant uncertainty and confusion about health implications
and its effectiveness as a smoking cessation aid. This would be very helpful given the
increase in the public perception of harm around e-cigarettes.

8.4. We would be opposed to entities with a commercial interest in e-cigarettes being able to
run public health campaigns, due to the clear conflict of interest. Additionally, to ensure
the UK complies with Article 5.3 of the WHO Framework Convention on Tobacco Control
(FCTC), the tobacco industry and their subsidiary e-cigarette companies, should be
restricted from running public health campaigns.
9. The impact to date of the Tobacco and Related Products Regulations on the vaping industry and on the prevalence of e-cigarettes.

9.1. The TPD is still a relatively new piece of legislation, with many of its provisions having only been in force for around 18 months. We are keen for the TPD to be comprehensively evaluated, to get a better picture of its long-term impact on e-cigarette uptake.

9.2. One area where the TPD has seen early success is the notification procedure regarding product quality and safety. By the end of September 2017, over 32,000 e-cigarette and refill container products had been notified to the MHRA by over 400 companies. This process is considered much less burdensome than medicines authorisation.

10. The safety of e-cigarette devices, and any safety regulation requirements.

10.1. All e-cigarettes on sale in the UK are now required to submit a notification to the Medicines and Healthcare products Regulatory Agency (MHRA) with information about their products. These products must meet the requirements set out by the TPD, which include key restrictions on the nicotine strength of refills, as well as labelling requirements and warnings.

These restrictions ensure certain safety standards for devices. Meanwhile the MHRA have also set up a Yellow Card reporting system for consumers and healthcare professionals to report any side effects or safety concerns with products. Any suspected defective or non-compliant products can also be reported to local Trading Standards.

10.2. Stop smoking experts (at the National Centre for Smoking Cessation Training) advise that as with any rechargeable device, like mobile phones and laptops, it is important to charge with the correct charger and not to leave an e-cigarette unattended whilst charging. There have been reported cases of e-cigarettes causing fires at a rate of around two per week in the UK, this is far fewer than the number of fires caused by cigarettes.

10.3. As electronic vaping device technology changes, it’s important that the regulations keep pace and are evaluated with emerging technologies in mind.

On finance:

11. The public finances implications of e-cigarettes, including how the rise in e-cigarette consumption could affect NHS costs.

11.1. We are yet to see a full, independent evaluation of the implications of e-cigarettes on public finances. However, we believe that there are likely to be some financial benefits from people switching from tobacco to e-cigarettes as a means of quitting smoking – both in terms of direct NHS costs and indirect societal costs.

11.2. Research by Cancer Research UK and the UK Health Forum in 2016 identified that tobacco-related diseases could cost an additional £3.6 billion per year in 2035 (£542 million direct NHS costs and £3.03 billion indirect societal costs). This research found that achieving a
tobacco-free UK by 2035 would avoid around £615 million in costs in 2035 alone (£67 million in direct NHS costs and £548 million in indirect societal costs). Increased e-cigarette use through people switching from smoking to vaping could help the delivery of a tobacco-free UK by 2035, and therefore play a role in reducing the costs associated with tobacco-related diseases.

Heat Not Burn:

12. Unlike e-cigarettes, heat-not-burn (HNB) tobacco products are a largely unknown entity, and all of these products are owned by the tobacco industry. There is currently no independent evidence of their safety. We need more evidence, independent from tobacco industry funding or involvement, to determine the level of harm these products may cause, as well as the extent of any potential benefits compared to continued use of tobacco cigarettes.

December 2017

1 WHO Tobacco Fact Sheet 2017 http://www.who.int/mediacentre/factsheets/fs339/en/
7 PHE. 2016. E-cigarettes: a developing public health consensus
16 Polosa, Riccardo & Cibella, Fabio & Caponnetto, Pasquale & Maglia, Marilena & Prosperini, Umberto &
Russo, Cristina & Tashkin, Donald. (2017). Health impact of E-cigarettes: a prospective 3.5-year study of regular daily users who have never smoked. Scientific Reports. 7. 10.1038/s41598-017-14043-2.


37 Directive 2014/40/EU of the European Parliament and of the Council on the approximation of the laws, regulations and administrative provisions of the Member States concerning the manufacture, presentation and
sale of tobacco and related products and repealing Directive 2001/37/EC
38 Ministry of Social Affairs and Health, Finland (2016) Tobacco Act (549/260)
40 Action on Smoking and Health (2017) Use of e-cigarettes among adults in Great Britain 2017
41 World Health Organisation (2013) Framework Convention on Tobacco Control
http://www.who.int/fctc/text_download/en/
42 NCSCT. 2016. Electronic cigarettes: A briefing for stop smoking services.
http://www.ncsct.co.uk/usr/pub/Electronic_cigarettes._A_briefing_for_stop_smoking_services.pdf
http://www.cancerresearchuk.org/sites/default/files/aiming_high_-_tobacco_modelling_report_cruk_ukhf_0.pdf