E-cigarette packaging and retail appeal in the UK:
Summary for policymakers of two commissioned research projects examining e-cigarette packaging in the UK and recommendations

CRUK commissioned two studies [1,2] to explore e-cigarette packaging and retail appeal to understand if current e-cigarette packaging regulation is fit for purpose and, if not, how it could be improved. These studies provide a timely contribution to the current discussion around e-cigarette regulation, given the widely contested public health debate about their use as a smoking cessation tool versus concerns about the increase in e-cigarette usage in people who have never smoked and young people under 18.

The full research reports can be found on our website using the links below:

- University of Stirling: Moodie et al., 2023, Improving our understanding of e-cigarette and refill packaging in the UK.
- University of York: Thirlway et al., 2023, E-cigarette appeal in context: a qualitative study in deprived areas of the role of packaging in e-cigarette purchasing and use.

Summary

There is currently limited evidence on the features of e-cigarette products, such as colours or design, that appeal to different ages. To understand how legislation could reduce the appeal of e-cigarettes to young people without excessively limiting their appeal to adults seeking a smoking cessation tool, it is important to explore the packaging and retail appeal of e-cigarettes in more detail. CRUK therefore commissioned two studies by the University of Stirling and the University of York to explore this further.

The University of Stirling study found good compliance overall of e-cigarette packaging with the UK's Tobacco and Reflated Products Regulations 2016 (TRPR); however, a revision of regulation could safeguard against the inclusion of features on packaging that may appeal to young people, for example: bright colours, cartoonish font and non-literal flavour descriptors. In both studies, the main appeal of packaging was the colours that contributed to bright displays in-store and in shop windows, which was mostly related to disposable e-cigarettes. The appeal of disposables was perceived to be related to high visibility in stores, small size (and therefore convenience and discretion), simplicity of use, and, in one of the studies, also low price and lack of long-lasting odour. However, across both studies, the key influences on purchasing for all ages were not related to packaging and were: flavour, cost, convenience and social factors.

These findings suggest that although instances of e-cigarette packaging not complying with current regulation were limited, the legislation as it stands may not be adequately preventing e-cigarettes from appealing to young people. Further regulation will be needed to rectify this. Any future regulation aimed at protecting young people from taking up vaping will need to adequately consider the potential impact on how people who smoke perceive and use e-cigarettes, and on smoking rates more generally. Given that smoking remains the biggest cause of cancer and death in the UK, it is also important that regulation across tobacco and e-cigarettes is coherent and proportionate to their respective risks, and is considered holistically to ensure the right balance is struck between protecting young people and reducing tobacco-related harms.

Based on the findings of the two reports and the existing literature and context, Cancer Research UK recommends action in the following areas:

In shop-display: The UK Government must investigate restrictions into where and how e-cigarettes can be displayed in shops.

Appearance: The UK Government should introduce measures to restrict certain packaging features, and review how flavours are described, and how nicotine content information is presented.

✓ **Health warnings:** Further evidence into relative risk messaging must be gathered to understand how best to reduce the appeal of e-cigarettes for young people without negatively impacting those who smoke.

✓ **Enforcement:** Enforcement of existing age of sale and social media regulations for vaping must be improved. 'Challenge 25' should be made a legal requirement for all tobacco and e-cigarette sales across all UK nations.

✓ **Monitoring:** The increase in young people using e-cigarettes must be monitored closely by governments across the UK so that any further proportionate action can be taken quickly.

Background
Relevance of these commissioned studies

The public health implications of e-cigarettes – including to what extent they help people quit smoking versus initiate vaping in young people who have never smoked – is a widely contested public health debate. There are also concerns around the availability of illicit products not adhering to UK regulations, whether vaping could act as a gateway to smoking, and the environmental impact of disposable vapes.

The evidence so far shows that legal e-cigarettes are far less harmful than smoking[3,4,5,6,7,8,9,10] and can help people quit smoking[11,12,13,14]. However, as they are a relatively new product, their long-term impacts are unknown[15] and so they are not risk-free. They also often contain nicotine[16], which is a very addictive substance, so they shouldn't be used by people who have never smoked – and young people in particular. We are therefore very concerned about the increase in use of e-cigarettes in people who have never smoked and young people under 18.

According to Action on Smoking and Health's (ASH) 2023 adult vaping survey results, 9.1% of adults in Great Britain currently use e-cigarettes[17]. The majority of adults who reported vaping either also smoke currently (37%) or used to (56%), although 6.7% have never smoked[18].

The ASH youth vaping survey[19] found that in 2023, 20.5% of 11-17-year-olds reported having tried vaping. This is compared with 13.3-13.9% between 2017 and 2020, so it's important to monitor this upwards trend carefully and react accordingly. However, vaping is largely concentrated among those with a smoking history: 88% of 11-17-year-olds who have never smoked have also never vaped, and only 2.9% of those who have never smoked have reported vaping more than once or twice. Currently, use remains largely experimental, with 11.6% of 11-17-year-olds reporting having tried vaping once or twice and 3.7% vaping regularly (more than once a week).

Cancer Research UK believes in the need for balanced, evidenced-based regulation that prevents vapes from being marketed at young people and people who have never smoked, whilst still ensuring that these products are readily available for people who smoke to use as a cessation tool. To understand how legislation could reduce the appeal of e-cigarettes to young people, it is important to understand why e-cigarette products are appealing to this age group in the first place. It is also important to understand how the appeal could be reduced to youths without excessively limiting their appeal to adults seeking a smoking cessation tool. However, limited evidence is available on the exact features of vaping products that appeal to young people and may be responsible for the observed increase in vaping in this age group. Although it is widely speculated that the packaging, product features (e.g., colour, size, shape), displays and price contribute to this appeal.

The UK's Tobacco and Related Products Regulations 2016 (TRPR) mandates the contents, packaging and marketing of e-cigarette products (e-cigarette devices and e-liquid refills). A study conducted in Europe in 2018 explored refills compliance to the product requirements and product labelling outlined in TRPR [20]; however, there is a need to expand the evidence base on compliance in the current UK context and

packaging features with respect to the promotional role and impact of e-cigarette packaging. Furthermore, there is little evidence to date on how packaging and on-pack health messages are perceived by different audiences, and to what extent e-cigarette packaging may appeal to young people.

Our two commissioned studies by the University of Stirling (Moodie et al) and the University of York (Thirlway et al) exploring e-cigarette packaging and retail appeal aimed to understand a) how far packaging adheres to the current regulations (Moodie et al only), b) what it is about the packaging that may appeal to different ages, c) how people perceive the current on-pack health warnings and d) what it is about disposables as a specific product type that may appeal to young people. Due to the in-depth nature of both studies, we also have useful insights into the main influences on people when purchasing e-cigarettes that are not related to packaging. They are therefore a timely and important contribution to the evidence base and provide insights into whether the current regulation is fit for purpose and how it could be improved[a].

Research methods

The Moodie et al. study, "Improving our understanding of e-cigarette and refill packaging in the UK: How is it used for product promotion and perceived by consumers, to what extent does it comply with product regulations, and could it be used to better protect consumers?"[21], involved a systematic analysis of 156 packs on sale in the UK in the second half of 2022, using a coding framework to document key packaging design and promotional features of e-cigarettes and refills and whether packaging meets the requirements specified by the TRPR. Pack analysis focused on five categories of product type: E-liquids; Disposable Vapes; Refill Pods; Tanks and Cartomisers; and Vapekits. The following packaging features were documented:

- Pack structure (e.g., shape, size, materials)
- Pack graphics (e.g., colours, typeface, imagery)
- Inclusion of informational items (symbols, websites, social media links, price)
- Whether packs complied with TRPR.

Focus groups were then conducted with 70 people in England and Scotland to explore how young people (aged 11–17), adults who do not smoke, adults who smoke, and adults who smoke and use e-cigarettes, view e-cigarette packaging, including flavour descriptors, health messaging, alternative risk messages, and possible further regulations on e-cigarette packaging.

The Thirlway et al study "E-cigarette appeal in context: a qualitative study in deprived areas of the role of packaging in e-cigarette purchasing and use"[22], involved interviews with 50 people aged 16-70 (mean age 28) with various levels of vaping experience and 10 vape shop staff in deprived areas of Great Britain. Questions to people who vape focused on their own and their parents' smoking and vaping history, what vape products they had seen or bought, how they had chosen them, perceptions of the packaging and the health warnings, how they understood the relative risk of smoking and vaping, and their future plans in relation to smoking and vaping. If they used disposable vape devices, they were also asked where they had seen them, where they had purchased them and if they were under 18, whether their age had been checked by retailers. Vape shop staff were asked how customers chose products including disposables devices, the role of packaging and product names, customers' risk perception and their awareness of product health warnings.

Summary of key findings from both reports
Key packaging features of e-cigarettes and refills
The Moodie et al analysis of e-cigarette packaging identified key packaging features:

- a typical shape (i.e., a cuboid box or a short, cylindrical plastic bottle),
- symbols for environmental packaging/product disposal, age restriction, GB classification, labelling and packaging (CLP) hazard pictograms, company/brand website,
- colourful appearance (85% of packs were deemed colourful overall).

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[a] This policy brief is based on the findings from these two reports and wider literature; the policy recommendations are from a CRUK position and do not necessarily reflect the views of the research teams at the University of Stirling and the University of York.

Most packs (62%) had what the authors have described as 'fancy' features on the pack front, such as shiny product images, embossed brand logos, and metallic or foil details.

Cartoon characters were present on 3% of front of packs (all within the brand logos), with almost one fifth (19%) prominently displaying cartoonish script or crayoned font (all within the e-liquids and disposables categories).

Flavour descriptor text, as another component of the pack graphics, was present on all disposables, e-liquids and refill pods. Most of these descriptors (63%) referred to flavour blends, with 'concept' descriptors (such as Energy or Tropical Tsunami) used on 1 in 9 packs overall, and approximately 1 in 4 packs of e-liquids and tanks and cartomisers.

Adherence to the requirements specified by the TRPR

The Moodie et al pack analysis showed limited instances of e-cigarette packaging not meeting the UK's TRPR. In general, products met the requirements, although the analysis highlighted some ambiguities with TRPR wording and the related guidance and difficulties in making definitive assessments on some items.

However, despite a general adherence to the TRPR, the analysis identified several issues:

- Child warnings: One in ten products (10%) had no recommendation to keep the product out of reach of children (text and/or symbols) on the external packaging;
- Health warnings:
  - Three out of a total of 156 products analysed had non-compliant wording in the health warning text instead of the advised 'this product contains nicotine which is a highly addictive substance' and one product had no health warning at all;
  - Warning size as a proportion of the pack and placement on both the front and back surfaces did not always meet requirements;
- Corporate and social responsibility: 14 of 156 packs appeared to have pack elements or features suggesting environmental advantages such as improved biodegradability;
- Misleading health benefits: 10 of 156 packs were judged to create an erroneous impression about the products' characteristics, health effects, risks or emissions. For example, one pack used the text "less allergenic" and "easy on the throat", which was assessed as being misleading on 'health effects'.

Whilst products generally met the requirements, there were some breaches highlighted above. The analysis also highlighted some ambiguities with TRPR wording and the related guidance and difficulties in making definitive assessments on some items. Revised regulation to include specific packaging features in the TRPR, for instance bright colours, cartoonish font and non-literal flavour descriptors, would allow for more definitive assessments on compliance regarding the appeal to youth.

Appeal of packaging

Findings on the general perceptions of packaging and its influence on purchasing were mixed. Packaging appeared to have limited or no influence on peoples' purchasing decisions in the Thirlway et al study; however, the bright colours of displays of disposables were seen as generally appealing.

Participants in the Moodie et al study made an association between the colour of packaging and the risk of using the product: brightly coloured e-cigarettes (particularly disposables) were seen as less dangerous, reminiscent of soft drink or confectionery packaging and associated with children and young people. Dark colours were unattractive to several groups, including most teenage groups. Products packaged in grey were considered unattractive and aimed at people who smoke.

Branding

In the Thirlway et al study, participants showed little recall of brands for refillable vape devices, and although recall of disposable brands was higher, the brand itself appeared to play little role in purchasing decisions. Rather, people chose products based on recognition of what they had tried before and the product colour, which was associated with the flavour of the product (for example, a red package meant the product was a flavour like strawberry).

Flavour names/ descriptors

The Moodie et al study found that flavour blends (a combination of flavours) were the most common category to describe flavours and fruit blends were the most prevalent. Some of the younger participants in the Moodie et al study (a focus group of females aged 14-15) discussed flavour names likely being appealing (independently of the flavours themselves) particularly the fruit flavoured disposables. However, in the Thirlway et al study, participants talked about flavours they liked in general terms rather than by a specific name, saying for instance that they liked strawberry flavour, rather than 'Strawberry Ice Cream' specifically.

Novelty aspects

Novelty aspects of packaging were not discussed by many participants. In the Thirlway et al study, only 4 of the 50 participants with vaping experience mentioned disposable vapes with novelty aspects (glow-in-the-dark/flashing lights); all were women in their thirties. In the Moodie et al pack analysis, products were found that looked like make-up items, such as two disposables judged as resembling lipsticks aimed at younger girls and another disposable judged as potentially resembling a perfume atomiser.

Health warnings

The majority of participants across the two studies did not look at health warnings on the packaging or did not notice them at all; they were widely seen as ineffective in relaying information on nicotine content. In the Moodie et al study, most of the adult participants were unaware that packs even contained warnings and there was a cynicism around pack warnings: they were seen as existing to protect the manufacturers and not the user. The small size of the warning text was consistently mentioned. There was a range of responses to the toxicity warnings (i.e., 'Toxic if swallowed or in contact with skin'), including indifference ('everything's toxic nowadays'), bemusement and finding the warnings 'scary'. There was a consensus among participants in the Moodie et al study that the warning message saying the product is 'not for use by children' would not dissuade children as the products were simultaneously packaged in bright colours, had appealing flavours, and some featured QR codes. Furthermore, some older teenagers did not identify themselves as 'children', potentially limiting the extent to which this warning resonates with this age group.

Relative harm perception

Many participants misunderstood the harms of e-cigarettes and/ or believed nicotine to be more harmful than it is. In the Thirlway et al study, there was a difference in relative risk perceptions of using e-cigarettes between age groups: older participants who had switched from smoking to vaping were generally confident vaping was safer, but younger participants were more confused about the relative harm with some believing that vaping was more dangerous. This was in part due to misinformation on social media.

In the Moodie et al study, while several participants felt that presenting information about nicotine being addictive was necessary, it was not perceived as a deterrent. When shown alternative health messaging explaining the relative risk of vaping versus smoking, many participants in the Moodie et al study did not think that e-cigarettes are less harmful than cigarettes or safe to use, and concern was expressed about the potential impact of relative risk messaging on encouraging youth uptake.

Nicotine strength

Participants in the Thirlway et al study who used refillable devices understood nicotine strength; however, those using disposables incorrectly believed they had low nicotine content as disposables were labelled as 2%, rather than 20mg/ml.

Other key influences on purchasing and use
Flavours
Particularly for disposables, flavours were a key influence in purchasing behaviours for both adults and young people, with fruit flavours being the most mentioned. The range of flavours and ability to try new flavours was an appealing factor to users of both disposables and refillable devices, although some participants in the Thirlway et al study described that the intensity of the flavour was part of disposables' appeal. In the Moodie et al study, flavours related to confectionery and soft drinks were seen by some to encourage young people to try these, as they would with other products such as sugar-sweetened beverages.

Cost
Cost was another important factor influencing purchasing decisions. In the Moodie et al study, younger participants described how the lower cost of disposables was a factor that made them more attractive to teenagers and children, being sold at 'pocket money prices'. However, in the Thirlway et al study, most participants using disposables were concerned about the high ongoing cost of them and consequently many were planning to switch to refillable devices. A barrier to switching to a refillable device was the high initial cost and unreliability of some refillable e-cigarettes (leaking, battery life). Due to their concern about the ongoing cost of disposables, almost half of the participants in the Thirlway et al study who were using disposables switched to disposable devices with a larger e-liquid capacity (10ml or more), which are currently not legal in the UK/EU.

Ease of use
It was also important to users that e-cigarettes were easy to use. This was predominantly mentioned with reference to disposables, which were attractive due to their small size and ease of use, with no charging, filling, or switching on and off to consider. In the Moodie et al study, it was found that the small size of disposables, along with their short-lasting odour, made them easier for young people to conceal from parents and within schools.

Social influences
To decide what to buy, participants often took advice from family and friends as well as specialist shop staff. In the Thirlway et al study, older users discovered e-cigarettes through work colleagues, friends and family in particular; younger people discovered disposables primarily through their friends and social media.

In the Moodie et al study, several teenagers and adults recalled seeing e-cigarette packaging on social media (Facebook, Twitter, Instagram and TikTok); however, adult participants who do not smoke did not recall being exposed to e-cigarette advertising/promotion on social media. In the Thirlway et al study, some participants first saw disposable vapes on social media, but this was just as likely to be on their friends' stories as on commercial or influencer accounts.

Visibility
Participants often commented that the visibility and easy availability of disposable devices served as prompts for them to purchase the product. Colourful displays were the main aspect of disposable e-cigarette packaging that appealed to all ages, particularly in windows and at point-of-sale in shops: this was not just about individual product colour, but rather the accumulation of different colours. In the Moodie et al study, participants expressed that e-cigarette packaging is 'everywhere' and reported seeing e-cigarettes in various public locations such as shops, advertising and as litter on the street. Participants under 18 also described the visibility (and use) of e-cigarettes in schools. Overall, the high visibility and exposure to e-cigarettes was seen to have a normalising effect.

Accessibility
Both studies seemed to support the notion that e-cigarettes are easily accessible to young people. In the Thirlway et al study, teenagers under the age of 18 were able to access e-cigarettes through proxy buying, from parents or older friends, and/or from shops that did not require proof of age, which were mostly non-

specialist retail shops such as corner and convenience stores, rather than supermarkets or specialist vape shops. In the Moodie et al study, several participants also suggested that those under 18 would find it relatively easy to purchase e-cigarettes from some shops.

Policy discussion

These two studies suggest that although instances of e-cigarette packaging not complying with current regulation were limited, the legislation as it stands does not adequately prevent these products from appealing to young people. Further regulation will be needed to rectify this. It will also be essential that any future regulation aimed at protecting young people from taking up vaping adequately considers the potential impact on how people who smoke perceive and use e-cigarettes and on smoking rates more generally.

It is important to consider the holistic picture if the UK Government does implement further restrictions on the visibility and appearances of e-cigarettes. Tobacco remains the biggest cause of cancer and death in the UK[23]. The evidence so far also shows that legal e-cigarettes are far less harmful than smoking[24,25,26,27,28,29,30] and can be an effective cessation tool for some people[31,32,33,34]. However, it is also crucial that the UK Government prevents uptake of vaping by young people and those who do not smoke. Therefore, the cumulative effect of polices introduced needs to be carefully considered in order to achieve the right balance of both protecting youth, people who have never smoked, and helping people who smoke to quit.

The bright colours of e-cigarettes – and disposables in particular – was suggested as being one of the factors that made these products appealing to young people. E-cigarette displays and the combination of the colours in shops were also considered by participants in both studies to be appealing. Packaging and display of e-cigarettes are therefore areas where further regulation could potentially help to limit the attractiveness of these products to young people. With e-cigarettes, both the outer packaging and the products themselves can be branded. Therefore, any restrictions on the appearance of packaging would likely also need to be applied to the products themselves, as unlike cigarettes, people often discard the packaging.

However, further regulation must also carefully consider the impact packaging or display restrictions would have on peoples' perceptions of the relative harms of vaping versus smoking. These studies also indicated that participants already have some misconceptions around the relative risks of vaping and smoking. Relative health warnings or public health campaigns could be explored as an option to counter these misperceptions and to balance the potential impact of further packaging restrictions.

In addition, these studies also suggest issues with the enforcement of other legislation aimed at protecting young people – and in particular legislation meant to prevent the sale of e-cigarettes to youth. Whilst not the focus of this study, young people also recalled seeing e-cigarettes on social media – a channel already highlighted in a previous CRUK-funded study where there is a clear need for further regulation[35].

Policy recommendations

Based on the above, to reduce the appeal of e-cigarettes to young people, Cancer Research UK recommends that:

In shop-display: The UK Government must investigate restrictions into where and how e-cigarettes (both in packaging and out of packaging) can be displayed in shops.
If display restrictions are implemented, exceptions should be made for specialist vape shops. The UK Government must also consider how to avoid this creating a barrier for people who smoke or further misconceptions around the relative harms of e-cigarettes compared to tobacco products.

Packaging: The UK Government should introduce measures to minimise the appeal of e-cigarette packaging to young people. This could include guidelines around the colours of packaging, for example.

Further research is needed to identify the potential impact of particular packaging restrictions and how regulation would best avoid appeal to youth whilst not discouraging adults who smoke from switching to vaping, or create misperceptions about the relative harms of vaping and smoking.

Product appearance: The UK Government should also consider when introducing the above measures whether packaging restrictions should also be applied to the products themselves.

Flavour description: How flavours are described must be reviewed to prevent them from appealing to children, for example, by emulating soft drinks or confectionery names, or 'concepts' like 'Tiger Blood' that denote neither flavour nor taste.

Research: Further research must be undertaken into how vaping products appeal to both youth and adults who smoke. This should include research into the impact potential restrictions on packaging may have on adults who smoke (and their perception of e-cigarettes), how and where e-cigarettes are displayed and marketed, and the influence of pricing mechanisms.

Building on the findings above and considering the wider context and literature, to ensure that consumers have adequate information on the risk and relative harm of e-cigarettes compared to tobacco products, Cancer Research UK recommends that:

Relative risk health warnings: Further evidence into relative risk messaging must be gathered to understand how best to reduce appeal for young people without negatively impacting those who smoke.

Information on nicotine content: Government must investigate a uniform way of presenting nicotine content on packs to avoid confusion when nicotine content is presented in a different way (e.g., as a percentage).

In addition, all of this will need to be underpinned by improved enforcement of existing regulations, as well as continued monitoring. In particular, we recommend that:

Enforcement of age of sale regulations: Enforcement of age of sale regulations for vaping (and smoking) must be improved to reduce young people's access to vaping products and cigarettes. Challenge 25 should be made a legal requirement for e-cigarettes (and tobacco products) across all UK nations, as it already is in Scotland.

Enforcement of social media regulations: More must be done to enforce compliance to e-cigarette marketing regulations on social media. If proactive monitoring and regulating of advertiser-owned social media profiles and content is not possible and/or cannot be promptly introduced, then the UK Government must also consider legislative instruments prohibiting commercial social media accounts that promote e-cigarettes in any way.

Monitoring: The increase in young people using e-cigarettes must be monitored closely by governments across the UK so that any further proportionate action can be taken quickly.

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