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ELECTRONIC CIGARETTE MARKETING: CURRENT RESEARCH AND POLICY

A report by Linda Bauld, Kathryn Angus, Marisa de Andrade and Allison Ford

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CONFLICT OF INTEREST STATEMENT

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EXECUTIVE SUMMARY

This report outlines results from three separate but connected pieces of research. First, a review of the current e-cigarette market drawing on available data from market analysis, the trade press and other published sources. Secondly, a systematic rapid review of the e-cigarette marketing literature published in peer reviewed journals between 2011 and 2016, updating our previous work in this area. Finally, a description of the past and current regulatory framework for e-cigarette marketing in the UK, drawing on semi-structured interviews with key professionals working in the field and relevant documentary sources.

The E-Cigarette Market

The e-cigarette market in the UK and globally is in a constant state of change creating a complex situation that is quickly out of date. Available information on the market from a range of different sources – including from researchers, charities, advocates, trade associations, analysts, journalists, health bodies and industry professionals from the tobacco and independent sectors – is variable and often contradictory in nature. Given the ways in which current data are presented, there appears to be confusion over whether the tobacco industry (TI) or independent sector has a greater market share.

The availability and appeal of first-generation e-cigarettes (cig-a-likes as they look like tobacco cigarettes or closed systems) initially drove the market, which then expanded towards second-generation products (usually larger than cig-a-likes and resembling fountain pens). Third-generation products – also known as vapours, tanks and mods (VTMs), personalised alternatives with novel flavours or open systems available from vape shops – enhanced vaping capacities and designs arrived towards the end of 2013. This part of the market is larger and growing at a much faster rate. The TI reportedly owns the leading e-cigarette brands, but currently has almost no foothold in the vape shop share of the market, where many second and third generation products are sold. Indeed, the majority of e-cigarette users (around 66%) in the UK are currently using tanks.

E-cigarettes were the fastest growing product category in British supermarkets in 2014. Tobacconists or e-cigarette shops were amongst those opening most branches during 2015 in town centres. Across the majority of e-cigarette brands, London and its surrounding areas and northern England (particularly the northwest) are a focus for brand distribution in the UK. The five most saturated regions in the UK for retail distribution outside vape stores are London, northeast England, southeast Wales, northwest England and the West Midlands. The East of England, Northern Ireland and Scotland do not have such a significant presence of stores – although one of the top five largest retailer chains, EcigWizard is currently focusing on the East of England. British American Tobacco's (BAT) e-cigarette Vype is sold in Lloyds Pharmacy stores and Puritane, owned by Imperial Tobacco's subsidiary Fotem Ventures, is exclusively available at Boots.

Tobacco industry efforts to build a market for reduced-risk products show evidence of a recent focus on vapour devices that are not e-cigarettes, but rather primarily other product categories and diversification. For example, heat-not-burn that uses tobacco heated at high temperatures (but not burnt) instead of e-liquid.

Only one product has been granted a medicinal license by the UK's Medicines and Healthcare Products Regulatory Agency (MHRA) following standard procedures. E-Voke, produced by BAT's subsidiary Nicoventures, is an e-cigarette which has been produced following another licensed device, Voke, produced by the same company which is an inhaler which contains no electronics, heat or combustion. Medicinal licenses for Voke and e-Voke allows them to be marketed as smoking cessation aids, to

make health claims and to be prescribed by health professionals as well as sold over the counter in pharmacies. However, importantly neither Voke nor E-Voke is yet available on the UK market.

The introduction of the EU Tobacco Products Directive will introduce substantive changes that will both affect the e-cigarette market overall but also limit marketing opportunities.

The less restrictive packaging environment for vaping products lets e-cigarette manufacturers make a statement and use packaging to express their brand and product differentiation. There are recent signs that the price of e-cigarettes and vapour products has declined both online and offline. While in supermarkets and convenience stores prices have been falling, two offline channels, the pharmacy and petrol/travel retail sectors (primarily convenience stores within petrol stations) are relatively expensive, with prices static or even increasing. The prices of tank products appear to be more standardised across websites, suggesting more stable demand. According to some analysts, the decline in e-cigarette pricing is at least partly due to the expanding vapour category and development of vapours, tanks, mods and refills that are generally retail cheaper.

The e-cigarette market currently represents less than 1 per cent of the tobacco market. However, it is growing year on year and at least one market analysis suggests that annual sales of e-cigarettes could outstrip tobacco by 2024.

Rapid Review of Published Research

The purpose of the rapid review was to identify peer-reviewed research on e-cigarette marketing and to summarise the studies' findings on: the nature and extent of e-cigarette marketing; and any actual or perceived effects of e-cigarette marketing on children and adults.

Six academic literature databases were searched using permutations of e-cigarette, e-shisha, vaping, marketing, advertising, promotion, social media and sponsorship as search terms on March 31st, 2016. To be included in the rapid review, studies had to: be published between January 2011 and March 2016; be an empirical study published in a peer-reviewed journal; and use quantitative measures to examine a marketing element of e-cigarettes, i.e. advertising and promotion channels, pricing or availability from commercial sources. Journal articles that were editorials, commentaries, policy or legal analyses, and reviews were excluded. The data were extracted from all the included studies and the findings reported in a narrative synthesis, arranged by the types of marketing, and then, for the studies with people as subjects, by the outcomes measured.

The rapid review included a total of 73 peer-reviewed studies on e-cigarettes and marketing published in 75 papers between 2011 and the end of March 2016. The findings were split into three main categories: studies of the nature of e-cigarette marketing, studies on the effects of e-cigarette marketing on children (≤18 years) and studies on the effects of e-cigarette marketing on adults. Where relevant, the review focused on findings most relevant to the UK.

Studies of the nature of e-cigarette marketing

43 studies (published in 42 papers) looked at the nature and/or extent of an element of e-cigarette marketing. All were observational studies and most were conducted in the USA (n=32); four studies came from the UK, two from Canada and one each from China, South Korea and Switzerland; and one study covered 45 countries, another covered two (Canada and the USA). Overall, there was a considerable amount of data on the type, location, frequency and content of e-cigarette marketing. Some data on advertising spend and price of products were given. Few of the studies were conducted

in the UK, however other studies focused on marketing channels that could be accessed from the UK (eg. via social media).

Thirteen studies examined the nature of e-cigarette marketing via social media channels, YouTube and Twitter. They were used by manufacturers, retailers and vapers to promote e-cigarettes. It was difficult to distinguish between paid, unpaid and user-generated promotional content.

Five studies looked at marketing content across a range of other channels, including: print, TV and other broadcast media; through vaping conventions; and online through banner and video adverts. The types of marketing were diverse during the time-periods studied and different channels of marketing were intended to target different audiences.

Four studies from the USA examined e-cigarettes advertising spend; the trend data showed that the advertising spend increased during the time period each study covered. Four studies covered the pricing of e-cigarettes, with one multi-country study finding that that tobacco products were cheaper than e-cigarettes in most countries, except the UK, where e-cigarettes were cheaper overall.

Eight varied studies analysed e-cigarettes online retail marketing; some looked at the content of promotions for retail sales online, while others looked at the range of products for sale and how sales were promoted. Some findings had less UK relevance now, where the CAP code and the TPD prohibit messages like effectiveness for smoking cessation or other health claims. Other findings highlighted promotional approaches such as using messaging that appealed to social status, social activities, romance or celebrity endorsement.

Twelve studies, including two from the UK, surveyed e-cigarette marketing in shops. Overall, the prevalence of retail outlets and the extent of displays in shops increased over the studies' time-periods. The promotion of e-cigarettes at point-of-sale was prevalent in a range of types of retailers and many of the tobacco retailers also sold e-cigarettes. A Scottish study found that 77% of the tobacco retailers audited in the study stocked at least one brand of e-cigarettes.

Studies of the effects of e-cigarette marketing

Thirty studies (published in 33 papers) had human participants (21 with adults, 8 with children and 1 with both adults and children). Most of the studies had observational designs, however nine of the studies with adults and children used an experimental design.

Studies of the effects of e-cigarette marketing on children

Nine studies examined perceived or actual effects of e-cigarette marketing on children (11-18 years). Six studies were from the USA, two studies were from the UK and one from Finland. There was a greater focus on recall of e-cigarette advertising in the studies, with less data on recall of other promotional channels, brand awareness and procurement of e-cigarettes.

Overall, the studies showed that this age group were aware of e-cigarette advertising via multiple channels: TV, posters, billboards, internet, newspapers, magazines and shops. Awareness of e-cigarette advertising was generally higher in the studies from the USA than elsewhere. For example, in a large representative survey from the USA in 2014, 66.4% middle school, 70.9% high school students could recall e-cigarette advertising or promotion; and a time series analysis showed that 12-17 year-olds' exposure increased by 250% between 2011 and 2013 in the USA. However, in Finland in 2013, e-cigarette advertising recall was just 10.5%.

Only one study, from the UK, measured e-cigarette brand awareness. It found that 84% of 11-16 year olds in the UK could not name (unprompted) an e-cigarette brand when asked. In four studies, young e-cigarettes users recounted commercial sources when asked to recall where they purchased or procured e-cigarettes; three in the USA and one in Finland. Commercial sources were less frequent than informal sources; across the studies the most common source of access was friends (35.9%-79.9% between four studies). All the studies were conducted when age of sale restrictions were not yet in place or had been very recently introduced.

Two of the studies with children used an experimental design to assess any effects of e-cigarettes marketing. The first, with 11-16 year-old never smokers and never vapers in England, found that those exposed to e-cigarette adverts with flavoured e-liquids (vs. unflavoured or no adverts) viewed the adverts as more appealing and reported more interest in trying the product. However, there was no difference in susceptibility to smoke tobacco between the groups. The second study, with 13-17 year-old never users in the USA, found that viewing e-cigarette adverts increased the appeal of products and increased reported intention to try an e-cigarette. The attitudes towards e-cigarettes were significantly more positive among those that viewed adverts vs. the control group; e.g. 'enjoyable', 'healthy', 'safe', 'fun', 'smart', 'cool', 'attractive'. However, as in the UK study, viewing the e-cigarette adverts did not affect perceptions of the harmfulness of tobacco cigarettes or attitudes towards using tobacco cigarettes.

Studies of the effects of e-cigarette marketing on adults

No studies on the effects of e-cigarette marketing on UK adults were identified. Of the twenty-two studies we did find, the majority were from the USA. Most of the studies were cross-sectional, measuring adults' recollection of the type or 'channel' of e-cigarette advertising to provide a 'snap-shot' of data from a single time point.

Among the different adult populations studied, i.e. young adults, ever e-cigarette users, former and current smokers, all were aware of e-cig advertising, including from multiple sources. Awareness levels were generally higher among adults than in the studies with children. Awareness of e-cigarette advertising was higher in US studies than in studies from the Netherlands and New Zealand. Vapers and tobacco smokers more likely to report exposure to and awareness of e-cigarette advertising. Very few studies measured adults' recall of e-cigarette marketing via other promotional channels. Only one study measured commercial advertising awareness amongst healthcare professionals, finding that it was the third most reported source of awareness of e-cigarettes, after patients and news stories.

Receptivity to e-cigarette adverts was not particularly high. In this studies measuring this outcome, adult respondents more likely to rate e-cigarette adverts negatively compared with other adverts on measures such as: 'liked them', 'found them funny', 'found them sexy'. Adults smokers and e-cigarette ever-users more likely to be receptive than those who were not.

Seven studies, all from the USA, used an experimental study design with adult subjects. Overall, these studies showed the impact of e-cigarette advertising, such as ad exposure and receptivity, on variables such as intention and desire to use an e-cigarette and urge to smoke a tobacco cigarette. In several studies e-cigarette advertising was associated with intention or desire to use an e-cigarette among populations of young adults. Findings supported some of those from the cross-sectional studies such as current e-cigarette users being more receptive to adverts for branded e-cigarettes. One study found that e-cigarette advertising exposure increased interest to try an e-cigarette in two-thirds of smokers who had never tried an e-cigarette, suggesting a positive role for advertising. Also another study found that e-cigarette advertising exposure did not change smokers' existing desire to quit smoking.

Regulatory framework for e-cigarette marketing

This section of the report draws on stakeholder interviews and documentary review to capture the regulatory framework for e-cigarette marketing.

Between 2007, when e-cigarettes were introduced to the UK market, and 2014, by which time the market had grown rapidly accompanied by an increase in e-cigarette advertisements, existing Committee for Advertising Practice (CAP) / Broadcast Committee for Advertising Practice (BCAP) frameworks were presenting regulatory challenges. This resulted in a CAP/BCAP consultation in 2014 which informed new rules on e-cigarette advertising. Intended to be an interim measure until the TPD came into effect in May 2016, the new CAP/BACP code, introduced in November 2014, provided specific protections, particularly for children and non-smokers and allowed e-cigarettes to be shown in use on TV. In practice, it was generally thought that the new code, particularly in relation to TV advertising was working well, with relatively few complaints submitted to the Advertising Standards Authority, although some stakeholders from the tobacco control community believed the code did not go far enough to control advertising.

In May 2016, new rules for e-cigarette advertising came into force via Article 20(5) of the EU Tobacco Products Directive, prohibiting cross-border advertising of nicotine-containing unlicensed e-cigarette products, including TV, radio, online (though with scope for retailers to retain websites making limited claims), newspapers, magazines and sponsorship . The Tobacco and Related Products Regulations (TRPRs) 2016, set out how the TPD applies in the UK. Associated guidance on the provisions has been developed by the Department of Health who, in their interpretation of the TPD, aimed to strike a balance between the need to allow current smokers to receive information on e-cigarettes to encourage them to quit and the need to protect never smokers, particularly children, from the effects of advertising. To ensure the TRPRs are reflected adequately in the CAP and BCAP codes, CAP and BCAP have recently launched a consultation (September 2016) in order to provide further detailed guidance on the new rules.

Stakeholders interviewed for the study raised future issues related to e-cigarette marketing following the introduction of the new rules contained within the TPD. These included issues around being able to make health claims in marketing e-cigarette products, future marketing of non-nicotine containing products, the division between information and promotion, and the potential diversion of resources to non-restricted media such as billboards and leaflets, and point-of-sale displays. Although legal challenges to the TPD, both in the UK and EU courts, have been overturned, including a ‘fatal’ motion in the House of Lords, the result of the EU Referendum in the UK may pose future implications for the provisions of the TPD. It is also likely that Scotland will impose additional domestic advertising restrictions, through legislation passed last year and regulations that will be developed in 2017. No other UK nations are currently planning additional marketing restrictions beyond the TPD. Examining the impact of this new policy framework via the TPD and any other legislation is a priority for research. Will these current and planned marketing restrictions protect never smoking children from regularly using e-cigarettes? Will they restrict communication about the products to adult smokers who could benefit from switching from smoking to vaping? Ongoing surveillance and future studies should shed light on these important questions.

1 INTRODUCTION

Electronic cigarettes (e-cigarettes) are now widely used in the UK and a number of other countries, primarily as a product to cut down or stop smoking. The World Health Organization recently estimated that half the world's population lives in countries where e-cigarettes are available. Growth in the range and type of devices has been significant (Zhu et al. 2014), but new regulation in Europe and elsewhere may change this. E-cigarette marketing has been the focus of a number of recent studies, and concerns have been raised about the impact of this marketing on young people, including in the UK. Our research team have completed two recent reports examining this issue, first for Cancer Research UK in 2013 (de Andrade et al. 2013a,b) and subsequently Public Health England in 2014 (Bauld et al. 2014). This study updates this previous work and provides an overview of current issues related to the e-cigarette market and e-cigarette marketing.

The study aims to:

- Assess the extent and nature of the e-cigarette market in the UK in 2015 and describe potential future trends.
- Outline findings from a rapid review of the peer-reviewed literature on e-cigarette marketing.
- Describe the current regulatory framework for e-cigarette marketing in the UK and outline how this is likely to change with national and EU regulation of marketing.
- Discuss the implications of findings for future research and policy.

2 METHODS

This is a rapid scoping report with three main elements. A range of data collection methods was used to conduct the research. Here we describe the approach taken in to collect and analyse data related to each part of the report.

2.1 E-Cigarette Market Data

This section of the report describes the current e-cigarette market in the UK and outlines how this has been developing and changing in recent years. While the UK is the primary focus, given the global nature of the market, references and in some cases comparisons, are also made to the wider international market (particularly in Europe and the USA).

The primary aim of this section is not to provide a critical analysis of the current situation but rather to highlight the range of information available in the public domain and to use this information to create an overall picture of the market – both in terms of tobacco industry (TI) and non-tobacco industry (non-TI) movement and progression.

2.1.1 Identifying Sources

The search involved: (1) customised Google searches for media articles, discussions and reports and (2) targeted known websites of relevant organisations and bodies including industry monitoring sites and TI and non-TI reports and websites. Key word searches were used to target specific facts and figures linked to the subject area. These were initially very broad, however the documents retrieved then helped to identify secondary search terms. Table 1 summarises the range of terms. These were used in various combinations across the five fields, in order to identify relevant resources.

Table 1: Study Search Terms

Industry: tobacco; e-cigarette; e-cig; electronic cigarettes; independent(s) industry/companies/manufacturers; tobacco harm reduction
Product: first-generation products; cig-a-likes; second-generation products; tanks; vapours/vapors, mods and personal vapourisers/vaporizers; electronic nicotine delivery systems (ENDS); vaping products; vaping devices
Activity: vaping, vape, smoking, smoke
Medium: internet, web, online, offline, retail outlets, pharmacy, convenience stores
Approach/details: sales, marketing, pricing, promotion, products, brands
Resource: statistics, reports, media, discussions, commentaries, blogs

An iterative approach was adopted in order to allow for a constant process of information gathering and refinement. Where possible, any literature was first screened by reading the executive summaries or contents to assess relevance. The full text or website was then explored. Any information obtained was briefly summarised and analysed to aid and guide the following searches. To further enhance opportunities for data collection, manual searches of the full reference lists and/or media links were also conducted. This continued until a coherent picture of the current e-cigarette market could be established.

The iterative process of searching, analysing and refining resulted in a total of 152 documents, media articles, reports, commentaries and websites being considered for the purposes of this analysis across the years 2013 to 2016. Due to the extremely fast-paced nature of the changing market, the time-

span for inclusion of the resources was kept deliberately recent, to ensure up-to-date information. Where resources provided helpful contextual details about the history and development of organisations these were also included for reference. Additionally, two market research reports from ECigIntelligence and Technavio.com (Global E-Cigarette Market 2016-2020) were analysed.

2.1.2 Limitations

There are a number of difficulties inherent in a study of this nature. First, information and data is gathered from a range of different sources including public health researchers, charities, advocates, trade associations, analysts, journalists, health bodies and industry professionals from the tobacco and independent sectors with various perspectives and/or objectives. As such, wherever possible a number of sources have been identified in order to present a range of statistics and information across the field.

Second, available data is extremely variable and is often contradictory in nature. The market does not offer a transparent and clearly evidenced process of recording information. At best, this means that the evidence should be viewed cautiously and across the different perspectives.

Third, the e-cigarette market is in a constant state of change – thus creating a very complex situation that is quickly out of date. To provide a current 'snapshot' of this market is not possible without detailing, to some degree, what has happened to lead it to its current situation. For this reason, the report provides background information about the ways in which companies have formed, expanded and moved across the industry and illustrates some of the reported ongoing and future problems it is likely to face.

Fourth, given the ways in which data is presented, it is difficult to divide the market by tobacco industry (TI) and non-tobacco industry (non-TI). Many overlaps occur within the e-cigarette market and resources, including analytical reports and media articles, report their findings across the two industries. Therefore, whilst every attempt is made throughout the report to highlight whether information relates to TI or non-TI companies, separate sections are not provided.

Finally, the terminology pertaining to e-cigarettes is inconsistent across a variety of sources. In some instances, the e-cigarette market is referred to as the 'vapour market' and split into 'e-cigarettes' and 'vapours, tanks, mods (VTMs) and personal vapourisers'. In others, 'e-cigarettes' is used as a homogenous term to describe the fragmented market comprised of first-generation e-cigarettes (also referred to as cig-a-likes or disposables), second-generation e-cigarettes (also called rechargeables) and third-generation e-cigarettes (also known as VTMs, personal vaporisers, modular units or open systems). This creates reported discrepancies on whether the tobacco industry owns the majority of the market or the independent sector dominates. We discuss this in more detail in Section 3.1 of this report.

2.2 Rapid Review

The rapid review element of this report describes findings from a review of the literature on e-cigarette marketing. To identify studies, a selection of relevant terms (including permutations of e-cigarette, e-shisha, vaping, marketing, advertising, promotion, social media, sponsorship) were used to search six literature databases: the business and marketing databases Business Source and WARC (World Advertising Research Center); the medical and public health databases Medline and CINAHL (Cumulative Index to Nursing and Allied Health Literature); a social sciences database Social Sciences

Citation Index; and the humanities database Arts & Humanities Citation Index. Searches were run on March 31st, 2016 and covered the period from January 2011 to that date. The start date for the searches was chosen to update our previous reviews on this topic. After duplicate results were removed, 334 papers were screened against the following criteria, of which of 73 studies published in 75 papers have been included in our review:

- include empirical studies published in a peer-reviewed journal since 2011
- include studies that use quantitative measures to examine a marketing element of e-cigarettes, including their advertising and promotion and the channels used, how they are priced, and their availability from commercial sources
- exclude editorials, commentaries, policy and legal analyses, and reviews published in academic journals.

A large body of peer-reviewed empirical research has been published on the design of e-cigarettes, examining elements such as flavourings, nicotine levels, the product's physical components and attributes, and packaging/labelling. Product design and composition is a key element of a manufacturer's (or retailer's) marketing strategy, however this element was beyond the scope and resources of this review.

Data were extracted from the studies identified for rapid review using a proforma with nine headings (see Appendix 1). The data extraction procedure was shared out amongst our research team and some members of the European Respiratory Society. This rapid review did not conduct individual quality assessments for each study, however the strengths and limitations of the evidence base are discussed. This report presents a narrative synthesis of the findings from the identified studies, focusing on studies that examine the extent and nature of e-cigarette marketing first, then the studies with human populations.

2.2.1 Limitations

The rapid review differs from a full systematic review in its methods. A very short timeline (three months) was available for the review and the preparation of the report hence the decision to conduct a rapid review rather than a fuller systematic review. Limitations include the following: the searches for studies were conducted systematically however results were screened for inclusion by only one researcher. Studies were not individually assed for quality and bias using a standard checklist. Data extraction was not checked by a second reviewer, although during narrative synthesis it was inevitable the full text papers were examined alongside the data extraction sheets. The rapid review could not cover all elements of the marketing mix. Some studies that measured awareness of social media platforms used in e-cigarettes marketing were excluded as we could not distinguish commercial from non-commercial or user-generated content by the outcome measures used.

2.3 Regulation of E-cigarette Marketing

This element of the report drew on interviews with key stakeholders in government, related organisations with a remit relevant to e-cigarette marketing, and the tobacco control community. Using purposive sampling, ten interviews were conducted with individuals who have knowledge and insight into e-cigarette marketing regulation within the broader context of tobacco control. Participants were selected to represent a range of organisations and perspectives, and included representatives from: the Committees of Advertising Practice (CAP); the Medicines and Healthcare Products Regulatory Agency (MHRA); Department of Health (England) (DH); Public Health England

(PHE); Department of Health (Ireland); Action on Smoking and Health (ASH); ASH Scotland; ASH Wales; Cancer Focus Northern Ireland (who host ASH Northern Ireland); and the Smoke Free Partnership, based in Brussels. A semi-structured topic guide was developed to manage data collection and an abbreviated version shared with participants in advance. The content of the guide was adapted to reflect differing stakeholder roles and perspectives, and focused on issues such as observed trends in e-cigarette marketing in the UK, previous and current regulations, organisational responsibilities with respect to these regulations, the EU Tobacco Products Directive (TPD) and the implementation of additional measures beyond those required by the TPD.

Nine interviews were conducted by telephone; one interview was conducted face-to-face. Data were collected in April and May 2016 and interviews lasted between 20 and 40 minutes. The majority were recorded as digital voice-files and fully transcribed for thematic analysis. Using a deductive and inductive approach, a coding framework was developed from emerging themes. The coded themes were then used as the categories for analysis, which were interpreted and discussed among the research team. This section was complemented by the analysis of relevant policy documents relating to the CAP/BCAP rules and the TPD and the accompanying UK regulations.

Ethical approval and governance for the interview element of the study was provided by the School of Health Sciences Research Ethics Committee at the University of Stirling. Informed consent to participate was facilitated using information sheets and signed consent forms. Governance arrangements required that the anonymity of study participants was protected as part of the reporting process and that direct quotations from participants would not be used.

3 RESULTS

3.1 The E-Cigarette Market

E-cigarettes have overtaken nicotine replacement therapy (NRT) as the primary aid used in attempts to quit smoking in the UK: an estimated 2.8 million people currently use e-cigarettes in the UK compared to 700,000 in 2012, almost all of whom are or have been smokers, and one third of whom no longer smoke (Action on Smoking and Health 2016, Technavio 2016). Nielsen's January 2016 statistics suggest that sales of e-cigarettes have increased by 22.2% on volume, up 31.9% in the past year (O'Donnell 2016).

The fragmented global e-cigarette market is valued at $11.92 billion with a growth rate of 30.59% in 2016. According to Technavio (2016), market size will reach $26 billion by 2020. North America has been the market leader since 2013. In 2015, its share was 40.92% followed by the UK and other countries in Western Europe where the market recorded revenues valued at $2.71 billion.

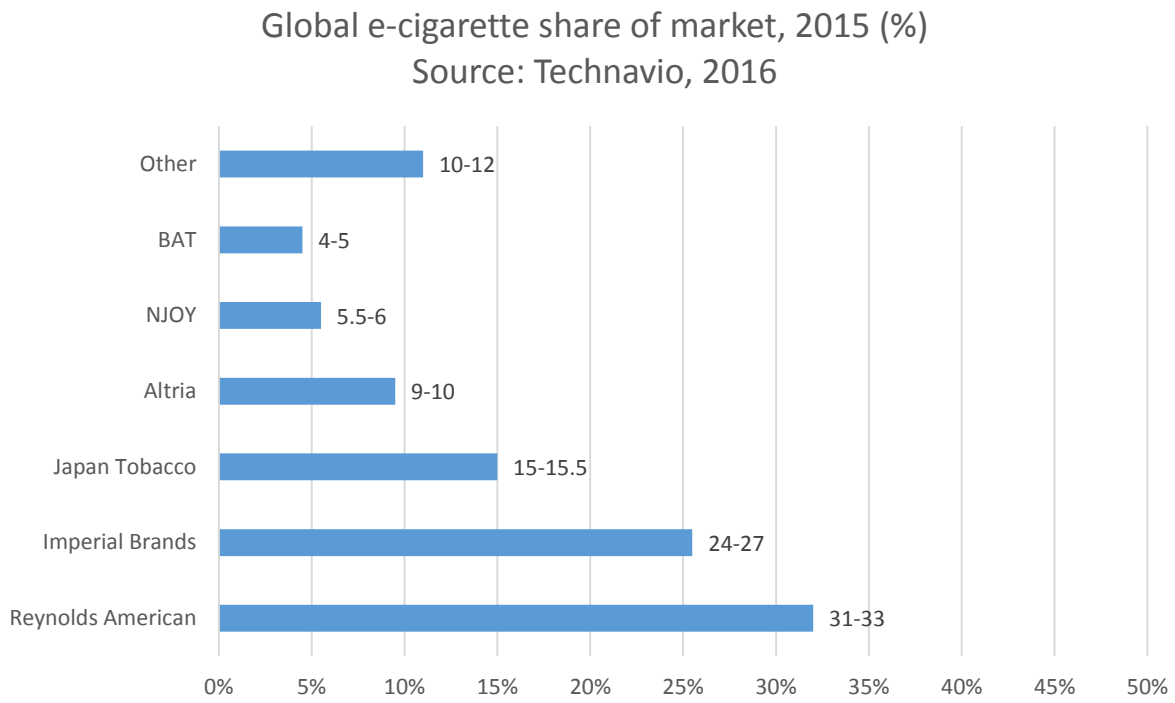
According to the ECigIntelligence Report (2015c), the UK e-cigarette market in 2015 was estimated to be £445 million, with the industry consensus that the market will continue to grow and mature. The ECigIntelligence model forecasts the 2017 UK market to be around £510 million, a projected growth rate of 15%.

Elsewhere, rapid growth in the e-cigarette market is predicted to continue over the next few years. Euromonitor suggest that the global market is still growing at a very fast pace and predict that vaping products could reach $50 billion by 2030. Globally, sales of vaping devices grew by 59% to a record $6.1 billion and in the world's largest market, the US, sales doubled to a total of $2.8 billion. The UK became the second largest market for electronic cigarettes, followed by Italy, Poland and France (Vape Ranks 2015). Whilst, according to BIS Research (2016), the global e-cigarette industry will experience compound annual growth of more than 22% between 2015 and 2025, with e-cigarettes reaching a market value of $50 billion by 2025.

Wells Fargo (2016) estimates that the US vapour market will reach $4.1 billion by the end of 2016 in the US. This market is separated into e-cigarettes (worth $1.6 billion) made up of convenience stores, food, drug and mass retail channels ($700 million), online ($500 million) and other ($400 million) channels; and vapours, tanks, mods and personal vapourisers worth $2.5 billion comprised of vape shops ($1.4 billion), online and other retail channels ($600 million); and convenience-stores, food, drug and mass retail channels ($500 million).

Natasha Kendall, tobacco analyst at Nielsen, says: "[Ecigarettes are] probably the future, but at the moment they represent less than 1 per cent of the tobacco market" (McClean 2016). Nevertheless, Bloomberg and Wells Fargo expect annual sales of e-cigarettes to outstrip tobacco by 2024 (O'Donnell 2016).

Figure 1: Global market, 2015



(Source: adapted from Technavio, 2016)

3.1.1 Tobacco Industry Involvement

The major tobacco industry companies have taken different approaches to entering the electronic cigarette market with some opting to make big acquisitions and others looking to develop their own products (Kendell 2014). This programme of investment has seen transnational tobacco companies all committed to major initiatives in the e-cigarette industry (Royal College of Physicians 2016). This includes British American Tobacco (BAT), Imperial Brands, the Altria Group, Reynolds American and Japan Tobacco International.

The acquisition of the e-cigarette brand Blu by the third largest cigarette manufacturer in the US, Lorillard, for $135 million, marked the tobacco industry's first major foray into the e-cigarette market in April 2012. In 2013, it became the market leader in the US securing 40% of the market (Technavio 2016). Lorillard then entered the UK market by taking over Skycig, a leading premium brand of electronic cigarettes in Britain, for $48.5 million. In line with its American brand, from May 2014, Skycig became Blu ecigs.

When Reynolds American acquired Lorillard for an estimated $27.4 billion on July 15 2014, its Blu line was sold to Imperial to avoid antitrust concerns that allowing Reynolds to own both Vuse and Blu would give it an unfair advantage in the market (TobaccoTactics 2016). Imperial therefore added to its previous acquisition – the e-cigarette unit of Dragonite International. R.J. Reynolds Vapor Company markets e-cigarettes manufactured by R.J. Reynolds Tobacco Company under the Vuse brand name – presently the leading selling brand globally available in over 100,000 shops (Technavio 2016). R.J. Reynolds has also developed Revo (Tobaccotactics 2016).

In December 2012, BAT became the first leading tobacco company to buy a British e-cigarette manufacturer through its purchase of the start-up, CN Creative, the maker of Intellicig (de Andrade et al. 2013a). This complemented BAT's earlier formation of what was billed as a stand-alone start-up company, Nicoventures, to 'focus exclusively on the development and commercialisation of innovative regulatory approved nicotine products' (British American Tobacco 2011). In August 2013, BAT launched the Vype – an e-cigarette developed by CN Creative. The company continues to invest in reduced harm products and in November 2015 the company acquired CHIC Group, a Polish vapour product manufacturer selling under the brand name Volish (Technavio 2016).

Altria and Philip Morris International (PMI) teamed up in December 2013 to market electronic cigarettes and other 'reduced risk' tobacco products. This followed Altria's acquisition of e-cigarette company Green Smoke in April 2014. Shortly after, in June 2014, PMI acquired UK-based Nicocigs, the owner of the Nicolites brand, with the aim of providing the company with a faster and broader entry into the UK market for their other e-cigarette products. Altria and PMI also manage vapour brands including Mark Ten and the heat-not-burn product iQOS, which looks like a second generation vapouriser but uses tobacco heated at high temperatures (but not burnt) instead of e-liquid (Royal College of Physicians 2016, TobaccoTactics 2016) and is therefore not an e-cigarette. Imperial Tobacco launched Puritane through its Fontem Ventures subsidiary and, in July 2014, obtained the Blu brand that was sold as part of Reynolds' takeover of Lorillard (Tobaccotactics 2016).

Japan Tobacco International (JTI) purchased E-Lites in June 2014 from previous owner Zandera. The company also took a minority share in the startup, Ploom in 2011, signing an agreement to commercialise its nicotine 'vaporisers' outside the USA. The Ploom is a loose-leaf vapouriser that heats small pods of tobacco, unlike most e-cigarettes that use liquid mixtures of nicotine and synthetic materials. In February 2015, JTI acquired the patents and trademarks from Ploom Inc. With this acquisition the company can develop new products and sell Ploom in more markets (Tobaccotactics 2016). In April the same year JTI announced that it had entered into an agreement to acquire Logic Technology Development LLC ("Logic"), one of the leading US e-cigarette brands. The brand sells a full range of rechargeable, ready-to-use and disposable e-cigarettes (JTI website 2015).

According to data compiled by Nielsen for *The Grocer*, (w/e 2 January 2016), the top e-cigarette brands are owned by tobacco companies (Ten Motives, Nicolites, Blu, E-Lites, Vivid) (O'Donnell 2016). According to Technavio (2016), Vuse secured more than 38% market share in 2015, followed by Blu owned by Imperial Brands then Japan Tobacco's brand Logic.

3.1.2 Non Tobacco Industry

Several e-cigarette start-ups and independent suppliers – an estimated 250 in 2014 – emerged when the product first launched in the UK (Bauld et al. 2014). In the US, an average of 10.5 e-cigarette brands and 242 flavours were introduced per month between August 2012 and January 2014 (Technavio 2016).

With a 48% market share, NJOY was the unrivalled market leader (a company independent of the tobacco industry) in 2012. By 2015, this figure declined to almost 5%. NJOY was aided by $70 million worth of investments from Brookside Capital and Morgan Stanley amongst others in 2014. The year before that, it received $75 million from Homewood Capital for research and development, marketing and clinical trials (Technavio 2016). In September 2016, NJOY filed for bankruptcy (Tobacco Reporter 2016).

The Electronic Cigarettes International Group currently offers a full range of products, from disposable and rechargeable cig-a-like analogs, to advanced vaping products, and specialty items. In 2014, the company acquired a succession of other companies, starting in January with Vapestick and the following month, US-based Fin electronic cigarette. Later in the same year they also acquired Must Have, which includes the brand VIP Electronic cigarette (Technavio 2016).

Other smaller independent companies, which include Ballantyne Brands, Nikotek, Vapor and VMR Products, are also operating in the competitive environment (Technavio 2016). The China-based seller, Joyetech, and other manufacturers have introduced nicotine-free e-cigarettes that are independent of the tobacco industry (Technavio 2016).

A large number of vape shops have since opened in the UK and globally offering second and third generation e-cigarettes, which allow consumers to modify their products (see Sections 3.1.3 Products and 3.1.4 Place below). New government regulations, for example those introduced in the US and EU member states, may lead to the closure of smaller, independent e-cigarette companies that may not be able to meet regulatory approval costs (Techanvio 2016).

3.1.3 Products

Over 90% of e-cigarette products sold globally are made in China, which is home to almost 1,000 manufacturers. Products are sold by over 500 e-cigarette sellers under varied brand names (Technavio 2016). The emergence of e-cigarettes has revolutionised the choice of nicotine products available to smokers (Britton et al. 2016). Early investments were weighted heavily towards first-generation, disposable cig-a-likes, which mimic tobacco cigarettes more closely, but tend to deliver lower doses of nicotine than later-generation devices (Royal College of Physicians 2016). However, these devices are being displaced in the UK by the rapid expansion of tank systems and of e-liquids. This shift is also strongly evident in other leading western European markets.

The availability and appeal of first-generation e-cigarettes initially drove the market, which then expanded towards second-generation products (see below). VTMs and personalised alternatives with novel flavours, enhanced vaping capacities and designs arrived towards the end of 2013. According to Techanovio (2016), VTMs account for 30-35% of the global market.

Table 2: Terms used for products

First-generation products	Also referred to as cig-a-likes as they look like tobacco cigarettes. Also referred to as disposables or closed systems.	
Second-generation products	Usually larger than cig-a-likes and look like fountain pens. Also called rechargables.	
Third-generation products	Also known as vapours, tanks, and mods (VTMs), personal vapourisers, advanced personal vapourisers (APVs), modular units or open systems.	

In general, tobacco industry efforts to build a market for reduced-risk products show evidence of a recent focus on vapour devices that are not e-cigarettes but rather primarily other product categories. For example, in July 2015 PMI announced it would be extending its international strategic collaboration with Altria in vaping products (Royal College of Physicians 2016). It is also investing in the heat-not-burn product, iQOS. Recent developments also suggest diversification. For example, BAT has continued to develop the Vype range, launching the products Vype eStick, Vype ePen, and the Vype eTank, along with a range of eLiquid flavours. BAT also has an inhaled nicotine device called Voke and in 2015 launched the new hybrid Tobacco Heating Product, glo iFuse. The blu™ product range is also expanding via its e-liquid portfolio and there are investments in heat-not-burn technology (TobaccoTactics 2016). In addition, RJ Reynolds has developed Vuse and Revo, whereas Imperial Tobacco launched Puritane (TobaccoTactics 2016).

Market analysts agree that there has been a significant shift to tank products. Some sources say tanks now make up a quarter of e-cigarette sales, fewer than one in 10 purchases were tanks a year ago (O'Donnell, 2016). According to ECigIntelligence (2015c), usage of tanks is now at 68% of the vaping population. In 2014 around 20% of users said tanks were their first purchase. In 2015 it was around 30%. Ex-smokers are also more likely to use a tank device. ASH (2015) state that the majority (around

66%) of e-cigarette users in the UK are currently using tanks. This is a significant swing from the previous year (41%). In 2015 around 30% of the sample said that tanks were their first purchase.

Due to some user problems with tanks and cig-a-likes, offline brands are trying to address the issues. For example, 10 Motives provides pre-filled clearomisers for the tank system (Cirro range); Philip Morris' Vivid vapour sells 'capsules' containing e-liquid and requiring purchase of a Vivid vapour atomiser; and BAT's Vype ePen sells pre-filled caps to fit onto their own battery (ECigIntelligence Report 2015c).

Amongst companies independent of the tobacco industry there is a multiplicity of second- and third-generation products. For example, V2 are a successful privately owned e-cigarette business with a strong online presence in the US, UK and Europe. The brand provides an extensive variety of e-cigarette products including the more advanced e-go/pen-like models alongside an exclusive women's range called *Vapor Couture.* There is also the *International Vaporgroup,* who owns the brands, Vaporfi (formerly Vaporzone), South Beach and Eversmoke. They sell a mix of brands focusing on both the cig-a-like products and also the e-go/pen-like products which are becoming the more preferred option for the more advanced vapers. The other large publicly listed e-cigarette stock independent of the tobacco industry is *Vaporcorp,* who own the brands Smoke 51, VaporX, Alternacig and Krave (Kendell 2014).

There is also evidence of increasing innovation in product design technology. Vapestick has created a retrostyle computer game named Electronic cigarette wars (Royal College of Physicians 2016) and the Jupiter IO 3: 3G Cellular Vaping Phone by Vaporcade offers the first e-cigarette phone. This evidence of merged-technology is a 3G-ready phone (Parsons 2016). Other innovations include Reynolds American's Vuse FOB power product that connects to mobiles through Bluetooth (Technavio 2016).

Table 3: Examples of available products across companies

Company	Available Products
British American Tobacco (BAT)	Vype; e-Voke; glo iFuse; Ten Motives; cartridge refills; e-liquids; accessories (batteries, atomizers, USB chargers, and filters)
Imperial Tobacco	Jai; Puritane; Blu; Blu Pro Kit; Cartridge refills; accessories (batteries, atomizers, USB chargers and filters)
Philip Morris International and Altria	MarkTen e-vapour; Green smoke e-vapour; cartridge refills; e-liquids; accessories (batteries, atomizers, USB chargers and filters)
RJ Reynolds,	Vuse system digital vapour cigarette; Vuse solo e-cigarettes, vuse FOB; Vuse connect e-cigarettes; vuse e-liquid; cartridge refills; accessories (batteries, atomizers, USB chargers and filters)
Japan Tobacco International (JTI)	Ploom e-cigarettes; E-Lites e-cigarettes; Logic e-cigarettes; Cartridge refills; accessories (batteries, atomizers, USB chargers and filters)
NJOY Inc	NJOY King e-cigarettes; NJOY daily e-cigarettes; NJOY Recharge e-cigarettes; NJOY VTMs; Cartridge refills; accessories (batteries, atomizers, USB chargers & filters)

(Source: Adapted from Technavio 2016)

3.1.4 Place

This section summarises the places where products are commonly made available to consumers.

3.1.4.1 Offline sales

According to Nielsen, during 2014 e-cigarettes were the fastest growing product category in British supermarkets and tobacconists/vape shops were amongst those opening most branches during 2015 (in town centres). Of the seven big offline brands studied, (Blu, E-Lites, 10 Motives, OK, Vapouriz, Gamucci and NJOY), Blu, E-Lites and 10 Motives have a large percentage of the total distribution points amongst mainstream retail outlets (the national supermarket chains, convenience stores, petrol stations and motorway service stations) (ECigIntelligence Report 2015b).

UK supermarkets make up the large majority of sales in 2015, followed by convenience stores. People buying their first e-cigarette in the last year are much more likely to go to a traditional retail/vape shop than three years ago when they would go straight to the internet. The traditional retail channel is becoming increasingly popular for first e-cigarette device purchases but is unable to attract users to make subsequent purchases. Instead, users are opting for more advanced devices or information not available in traditional stores and so go to specialised vape stores or online (ECigIntelligence Report 2015c).

Across the majority of brands, London and its surrounding areas and northern England (particularly the northwest) are a focus for brand distribution. The five most saturated regions in the UK for retail distribution outside vape stores are London, northeast England, southeast Wales, northwest England and the West Midlands. This is based on analysis of points of sale per one million inhabitants and points of sale per 300sqkm (ECigIntelligence Report 2015b). In contrast, the East of England, Northern Ireland and Scotland do not have such a significant presence of stores – although one of the top five largest retailer chains, EcigWizard is currently focusing on the East of England (ECigIntelligence Report 2015d).

However, brands also appear to have varying degrees of strength of focus across the UK – for example, 31% of NJOY's distribution is into greater London (ECigIntelligence Report 2015b). NJOY has 86% of its distribution points with two retailers (59% with Tesco and 27% with Sainsbury's). NJOY also stocks through Costcutter, SPAR and Londis but in lower numbers (ECigIntelligence Report 2015b).

According to Technavio (2016), some independent manufacturers are partnering with global distributers to access retailers. NJOY's partnership with Circle K, for example, allows its product to be sold in 30,000 US shops. V2 Cigs partnered with National Tobacco in 2013 to reach approximately 150,000 US retailers. Elsewhere, the US seller Gilla sells its products in South America through an agreement with an unidentified distributor.

ECigIntelligence (2015b) analysed data on the locations of 1062 vape stores in the UK (dedicated solely to vaping – not including tobacconists or other non-specialist stores) by splitting the country into 12 regions: Northeast, Northwest, Yorkshire and the Humber, East Midlands, West Midlands, East, South East, South West, London, Scotland, Northern Ireland, and Wales. The northwest region scored the highest on the following metrics: absolute number of vape shops, vape shops per capita and vape shops per square kilometre. The findings suggest that the West Midlands also scored higher than average on the same metrics. Yorkshire and the Humber and the Southwest scored high on the absolute number of stores and vape stores per capita. However, both had a relatively low score for the number of vape stores per square kilometre, which could be attributed to their relatively rural area structure. The London region has the highest density of vape stores per square kilometre.

However, the highly populated capital has low values for the number of stores per capita relative to the other regions.

Comparing France, the UK and the US shows that France has less variance in vape stores between its regions, which indicate a more developed market on this measure. The UK and US are more similar in that they have a large variance between different regions and could be considered to have relatively underdeveloped markets in comparison (ECigIntelligence Report 2015d).

3.1.4.2 Online sales

A significant portion of e-cigarette business is conducted on the internet. The market is active as it is currently relatively easy for independent companies to set up a new e-cigarette company online with small financial investment and no large advertising budget is required to achieve a web presence. In addition, most existing e-cigarette companies have their own websites and most also sell e-cigarettes over the internet (Zhu et al. 2014).

Overall, no e-cigarette brand has more than 42% of sales through any one distribution channel, with all benefitting from a varied retail approach (ECigIntelligence Report 2015b). The majority of single-brand websites (54% of the websites are single-brand) are selling tanks and cig-a-like products, with 44% of multi-brand websites selling cig-a-like products (ECigIntelligence Report 2015c). In addition, the majority of websites that focus on selling multiple categories of products from different brands are also offering products from their own labels, such as own-label starter kits. According to the ECigIntelligence Report (2015c), this signals an attempt at differentiation from competition.

3.1.4.3 Pharmacy sales

In the UK, as of February 2014, BAT announced its Vype e-cigarettes would be sold nationwide in 1,500 Lloyds Pharmacy stores. In the same month, Boots, the high street chemist, began selling the Puritane brand from Imperial Tobacco subsidiary Fontem Ventures. Puritane is exclusively available to Boots from Fontem.

Only one product has been granted a medicinal license by the UK's Medicines and Healthcare Products Regulatory Agency (MHRA) following standard procedures. E-Voke, produced by BAT's subsidiary Nicoventures, is an e-cigarette which has been produced following another licensed device, Voke, produced by the same company which is an inhaler which contains no electronics, heat or combustion. The medicinal licenses for Voke and e-Voke allows them to be marketed as smoking cessation aids, to make health claims and to be prescribed by health professionals as well as sold over the counter in pharmacies (Royal College of Physicians 2016). However, neither Voke nor E-Voke is yet available on the UK market.

3.1.5 Promotion

Major tobacco companies have benefited from large budgets for advertising and marketing their products (Kendell 2014). During 2013, around £8.4 million was spent in the UK promoting five leading brands of the time: the independently owned, NJOY King, Gamucci and the tobacco industry-owned E-Lites, SkyCig and Vype. Promotions took place across press, television, radio, the internet and outdoor media. In 2014, this figure was reached by Vype's and SkyCig's campaigns alone before marketing budgets of independent competitors were taken into account (Chapman 2014). BAT's

television advertising for Vype was part of a £3.6 million marketing campaign and Skycig invested in a £20 million marketing campaign (Bauld et al. 2014). A similar surge in marketing spending has occurred in the US across television, print, radio and the internet.

Indeed in 2015, Technavio (2016) reports that $88-90 million dollars was spent in the US on print media, followed by 30-32 million on TV and up to a further 12 million between B2B and outdoor holographic advertising, radio and digital display (Technavio 2016). This extensive array of marketing, sponsorship and promotional efforts has contributed to the rapid growth of the e-cigarette market and, according to the Royal College of Physicians (2016) reflects the increased resources available following the wave of investments in e-cigarettes by the tobacco industry.

Additional promotion activities across the industry include venue and sports sponsorship deals – example, links with football – Nicolites partnering with Birmingham City Football Club and E-Lites distribution deals and designated vaping areas in football stadiums. Furthermore, the O2 signed a multi-year partnership deal with E-Lites, allowing guests to use and buy the products in and around the arena (Royal College of Physicians 2016, TobaccoTactics 2016).

In early 2016 Blu launched its first global brand campaign since appointing the agency, The Corner, to its advertising account in 2016. The range of ads feature five characters – a motorcyclist, a comedian, a drag queen, a model and a pilot – who represent independent spirits carving their own path in life. The 'Just you & Blu' campaign consists of 90-, 60- and 30-second films for TV, cinema and online, as well as black and white outdoor and print ads (Oakes 2016). The campaign was launched ahead of the new advertising restrictions in May 2016 and aims to avoid the clichés that have historically defined early e-cigarette marketing: highlighting that it's not about battery life, or flavour ranges, or gadgetry, but '…real people enjoying a real moment with blu' (John Wardley, chief marketing officer for Fontem Ventures). This differs from BAT's Vype advertising campaign which featured a claim of 37 scientists working on its e-liquids (O'Donnell 2016).

Resources suggest that independent e-cigarette companies "…distance their products from tobacco" by using techniques such as aesthetic appeal, including attractiveness, coolness, colours and innovative packaging and flavour variations. In addition, the internet and social media tools are used to display attractive price promotions, competitions and group discount vouchers; there are celebrity endorsements and celebrity-inspired styling; and sports sponsorship (TobaccoTactics 2016).

As we set out later in this report, in Section 3.3, the introduction of the EU Tobacco Products Directive will introduce substantive changes that will both affect the e-cigarette market overall but also limit marketing opportunities. All broadcast or cross border marketing are prohibited in the UK and other EU member states from May 2016. This means that advertising and promotion of e-cigarettes are no longer allowed across TV, radio, print (except for trade publications), and online display. Campaigns like that of Blu, will therefore have to respond to these changes (Gwynn 2016).

3.1.6 Packaging

E-cigarette producers see the value in allowing potential consumers to have a direct view of their products within the package and suggest that the market is still maturing so customers are educating themselves on what products are and which brand they should choose. Many of the leading e-cigarette marketers are using visual or high-visibility eye-catching packaging, including high-quality plastic folding cartons which enable them to be attractive whilst as informative as possible (Connolly 2016). The transparent front also works as a window to view more product details on the inside. This

form of design has been used for products from vapourisers and vaping starter kits to replacement e-liquid cartridges.

For experienced e-cigarette users, transparent packaging plays a less prominent role. Fontem Ventures (a subsidiary of Imperial Brands), for example, uses paperboard cartons to package its blu PLUS+ Tanks. The tank cartons are decorated with contemporary, upscale graphics and colour coding to help shoppers quickly locate their preferred e-liquid flavor. These approaches make it easy to shop the product family (Connolly 2016). Packaging innovations also include 'smart packs' produced by blu™ e-cigarettes that vibrate and flash a blue light when within 50 feet of other users, and which can transmit to Facebook, Twitter and MySpace profiles (Royal College of Physicians 2016).

In general, the less restrictive packaging environment for vaping products lets e-cigarette manufacturers make a statement and use packaging to express their brand and product differentiation. This includes embossing and high-gloss varnish to create visual and tactile feelings of indulgence (Connolly 2016).

3.1.6.1 Legislation and Packaging

Currently the Advertising Standards Authority (ASA) has the authority to ask an advertiser to modify or remove an offending advertisement. In the past they have enforced the rules to ensure that the public are not misled about false health claims or that products are not glamorised. We explore this issue in more detail in Section 3.3 of the report.

As outlined above, the EU's Tobacco Products Directive (TPD) is introducing changes into the e-cigarette market with a series of requirements that have been transposed into UK law through the Tobacco and Related Products Regulations (TRPRs). This includes specific requirements on packaging. The TRPR requires packaging to be child-resistant and tamper-evident; protected against breakage and leakage; and must have a mechanism for ensuring re-filling without leakage. E-cigarette products were previously only required to comply with general labelling and information requirements but under new legislation they must include a list of all ingredients by ordered weight; indication of nicotine content and delivery per dose; batch number; and recommendation to keep out of the reach of children. Each unit must also include a leaflet with instructions about use and storage, recommendation that young people and smokers do not use it, possible adverse effects and warnings for specific risk groups, addictiveness and toxicity, contact details of the producer and contact person within the EEA (ECigIntelligence Report 2015a, ASH 2016).

3.1.7 Price

There are recent signs that the price of e-cigarettes and vapour products has recently declined both online and offline (ECigIntelligence Report 2015d). In the year ending 29th March 2015, the price of one e-cigarette 'unit' (not distinguished by supplier brand or product type) was down by almost 6% (ECigIntelligence Report 2015d).

3.1.7.1 Offline pricing

While in supermarkets and convenience stores prices have been falling, two offline channels, the pharmacy and petrol/travel retail sectors (primarily convenience stores within petrol stations) are relatively expensive, with prices static or even increasing. Across these four channels in the UK, IRI

claim that in May 2015 the sales for e-cigarettes were £133.1million, with growth from the same period the year before at 19.7% (ECigIntelligence Report 2015d).

There are moderate to low price variations among the seven UK regions. Northwest England has a high number of vape stores. This is reflected in the pricing – the region has the lowest price for tank starter kits. In Northern Ireland, Scotland and the East of England the opposite is true: high prices reflect low numbers of stores (ECigIntelligence Report 2015d).

3.1.7.2 Online pricing

According to Alexa, across the top 50 websites serving the UK, the online prices of the cheapest e-cigarette products in the UK (although not all consumers will be buying the cheapest) have been falling since 2014 across the following product types: cig-a-like starter kit; cartridges; disposables; tank starter kit; clearomiser; and e-liquid bottles. This could be attributable to increased competition (ECigIntelligence Report 2015d).

Between 2014 and 2015 online prices declined considerably. Many online stores offer discount prices, especially in the cig-a-like category. In general, the pricing of cig-a-like products (kits, cartridges and disposables) fluctuates significantly from one website to another (more so than tank starter kits).

Prices online are generally cheaper than they are in offline vape stores, especially for tank starter kits. The prices of tank products (tank kits, clearomisers and e-liquid) appear to be more standardised across websites, suggesting more stable demand. According to some analysts, the decline in e-cigarette pricing is at least partly due to the expanding vapour category and development of vapours, tanks, mods and refills that are generally retail cheaper (Convenience Store Decisions 2016). Taxes introduced to e-cigarette products would likely drive prices up in future, although to date few countries are taxing e-cigarettes like tobacco (for example, Italy has recently raised taxes on e-cigarettes) (Technavio 2016).

3.1.8 Summary

If analysts' predictions are accurate, the vapour market will continue to expand globally in the coming years. Products, pricing, promotion and availability are likely to vary depending on the regulatory environment, acceptability and appeal of the products to users and public health, and industry investments particularly from the major players.

3.2 E-Cigarettes and Marketing: A Rapid Review of Published Research

This section outlines the findings from a rapid review of peer-reviewed empirical studies that have examined the nature of e-cigarette marketing and any perceived or actual effects of marketing on youth and adults.

This review builds on two previous reports by our team, as set out in the introduction in Section 1, and examines studies conducted in recent years, between January 2011 and March 2016. The review is organised under the following headings:

- Overview of published studies
- The nature of e-cigarette marketing
- The effects of e-cigarette marketing on children
- The effects of e-cigarette marketing on adults
- Studies with healthcare professionals.

3.2.1 Overview of Published Studies

This rapid review of peer-reviewed research on e-cigarettes and marketing published between 2011 and the end of March 2016 includes a total of 73 studies published in 75 papers. Most of the studies were published as English language journals articles, except one French-language journal article and one published conference abstract. Thirty studies (published in 33 papers) had human participants (21 with adults, 8 with children and 1 with both adults and children). The other 43 studies (published in 42 papers) looked at the nature and/or extent of an element of e-cigarette marketing. Six of the studies were from the UK and another three were from Europe (one each from Finland, the Netherlands and Switzerland) with the vast majority of the rest being from the USA. Most of the studies were observational designs but nine of the studies with adults and children used an experimental design.

3.2.2 The Nature of E-Cigarette Marketing

A range of peer-reviewed studies investigating the nature and extent of e-cigarette marketing were identified for this review. The findings are presented in five categories:

- social media channels for advertising and promotion of e-cigarettes
- other marketing/media channels for advertising and promotion of e-cigarettes
- e-cigarette pricing and ad spend studies
- online e-cigarettes retail marketing
- e-cigarettes in physical stores

The detail provided on each study is brief, but a more in depth summary is included for the four UK studies we identified (Cranwell et al. 2015, Hsu et al. 2013, Eadie et al. 2015, de Andrade et al. 2013b).

3.2.2.1 Social Media Channels

Thirteen studies were identified that met our inclusion criteria of peer-reviewed empirical studies that have examined the nature of e-cigarette marketing using a social media channel. Only studies that

indicated a commercial source for the social media content, rather than user-generated content, were included.

The content of much of the data analysed in these studies was often transnational or the country the data were from was unspecified. Categorising the studies by country of the lead institution or funder, nine were conducted in the USA (Hua et al. 2013, Huang et al. 2014a, Chu et al. 2015, Cole-Lewis et al. 2015, Kim et al. 2015a, Romito et al. 2015, Basch et al. 2016, Dai & Hao 2016, Huang et al. 2016), and one each in China (Luo et al. 2014), South Korea (Paek et al. 2014), the UK (Cranwell et al. 2015) and Canada (van der Tempel et al. 2016). Data were collected between 2007 and 2015. All the studies were cross-sectional, and two captured data from multiple years, one from 2007 to 2011 and the other from 2008 to 2013. Only the latter reported any time trends for the data. Seven studies were content analyses of YouTube videos and six studies were content analyse of messages sent via Twitter. Another study (de Andrade et al. 2013b, included in Section 3.2.2.2) also described collecting data from five social networking sites (Facebook, Twitter, Tumblr, YouTube and Pinterest) used by seven leading e-cigarette brands. However, the social media findings were not reported separately.

The seven YouTube content analyses either looked at a sample of videos containing e-cigarettes, or one looked at music videos only, another videos on e-cigarette safety and risk, and one compared e-cigarette with cigarette videos. The sample sizes for analysis varied from 63 videos of ≤4 minutes sampled from a 3-month period, to 28,089 videos from a 12-month period. Typical measures to collect data for the analyses of YouTube videos, included classification of the videos as advertising or not, uploaded by an e-cigarette manufacturer, whether they featured brand names, free trials, sponsorship, celebrity e-cigarette users, and the capture of message appeals or claims.

The UK study (Cranwell et al. 2015) was a content analysis of 110 UK chart music videos collected from YouTube between November 2013 and January 2014. The researchers analysed the music videos for brand appearances, including those by e-cigarette brands, as well as e-cigarette use and implied use. From analysing 110 videos by 10-second intervals, this cross-sectional study found that e-cigarettes were used in 2 music videos (2% of all videos) at 9 intervals, and implied use in 2 music videos (2%) at 10 intervals. E-cigarette branding was in one video (1%) at 2 intervals, the authors noting that packs of *E-Lites* e-cigarettes were held by dancers whilst also using them in “Hard Out There” by Lily Allen.

Another YouTube study was conducted by Hua and colleagues (2013). Although carried out by researchers in the USA, the video-sharing website is accessible in the UK. In over half of a sample of YouTube videos (randomly selected for a study of puff and exhalation durations by e-cigarette users around 2010), the videos were recorded as advertising (53%). The classification was used for videos with users who clearly disclosed that they sold e-cigarettes, received remuneration from an e-cigarettes company or if a coupon link to a company website was provided. Similarly, Romito et al. (2015) recorded 33% (21 of 63) of a sample of top 20 search results for e-cigarette videos under 4 minutes long in 2013, as advertisements, rather than instructional/how-to’s, product reviews, public health/educational, news stories, entertainment, or personal testimonials. Another content analysis of 365 YouTube videos uploaded between 2007 and 2011, assessed 85.2% as sponsored by e-cigarette companies, people who advertise for e-cigarette companies, or their websites (Paek et al. 2014). Most of the videos were evaluated as user-generated videos (79.2%) and only 8.8% as formal adverts. Finally, the study that used the largest data set to examine the extent and nature of e-cigarette videos posted to YouTube, collected and analysed one year’s worth of posted videos (28,089 unique videos) and associated metadata in 2012-13 (Huang et al. 2016). The study analysed account activity for e-cigarette brands’ official accounts but did not categorise other videos by user-generated or commercial source. The data showed that although the number of videos posted by the brands’ accounts up to June 2013 was low (eg. *blu* 32 videos, *Nicotek* 30 videos and *Finiti* 13 videos), combined views totalled nearly half a million.

Despite most of the Twitter content analyses being conducted predominantly by researchers in North America, as for YouTube, the online social media site is accessible in the UK. Five of the studies analysed general messages sent via Twitter and one analysed used 3-months' worth of Twitter data for the brand *blu*. One study analysed the content of 481 e-cigarette tweets (a posting on Twitter), the smallest data set; the largest data set was 1,669,123 tweets collected for analysis. Similar to the YouTube data, typical study measures for the Twitter data captured the source of the messages, brands, and promotional content such as trials and free samples, and advertising. The following example content analyses studies illustrate the extent and nature of e-cigarette marketing via Twitter; although each study had slight variations in its definitions of commercial or advertising tweets (not reported in detail below).

In an early sample of 73,672 tweets, collected in May to June 2012, 89.6% were classified as commercial (Huang et al. 2014a). Compared with the non-commercial tweets, commercial tweets were more likely to include links to websites (94% vs 11%, $p<0.001$) and to be retweets (19% vs 17%, $p<0.001$). A much larger sample of 1,669,123 tweets from 2008 to 2013, coded 93.43% as advertising e-cigarettes (ie. they mentioned brands, websites, or a promotional offer) (Kim et al. 2015a). The advertising tweets were retweeted more often than the non-advertising (28.7% vs 11.60%). The analysis found that most industry-related users came from a small grouping of highly active Twitter users (one major e-cigarette vendor generated up to 63% of tweets to over 100,000 followers). The study with most recent Twitter data reviewed here, collected 757,167 tweets from July to October 2015 (Dai & Hao 2016). This analysis of more recent tweets found a different ratio for commercial tweets versus non-commercial tweets (35.4% vs 48.0%, respectively) but commercial tweets had the largest potential reach (ie. a higher total number of followers per tweet). Dai and Hao (2016) note the change in volume of e-cigarette tweets over time, observing the 1208 e-cigarette tweets per day from the 2012 study (Huang et al. 2014a) compared to 9014 e-cigarette tweets per day of their own (the latter included non-commercial e-cigarette tweets).

Finally, some of the content analyses looked at the Twitter account user data. An analysis of the Twitter users' description or profile, rather than the content of the messages, reported that of 10,128 tweets collected between 2013 and 2014, 7.77% were tweets from retailers and 1.97% were tweets from companies that manufacture e-cigarettes/tobacco companies (Cole-Lewis et al. 2015). The majority of the analysed tweets were attributed to users classified as an 'everyday person' or from the e-cigarette community movement. One year later, an analysis of 300 e-cigarette tweets mentioning smoking cessation from January to December 2014, classified 45% as explicitly linked to e-cigarette or marketing companies, 10% to be from fake accounts and 4% from personal accounts with industry ties (van der Tempel et al. 2016).

3.2.2.2 Other Content Analyses of E-cigarette Marketing Channels

Five further content analysis studies were identified that met our inclusion criteria.

One examined data from the UK (de Andrade et al. 2013b), two used data from the USA (Richardson et al. 2014, Banerjee et al. 2015), and one analysed data from the USA and Canada (Richardson et al. 2015). One used international data collected online (Williams 2015a). Data were collected between 2012 and 2015, with 2012-13 the most frequently analysed time-period.

All the studies used a cross-sectional design. Each analysis looked at a different channel of e-cigarette marketing but all typically examined the structures and content of the channel and identified the themes used. The first study described below examined marketing to both consumers and

stakeholders in the UK via a range of channels; the next study looked at consumer marketing via conventions; and the final group of studies looked at traditional consumer advertising.

The analysis study from the UK (funded by Cancer Research UK and co-authored by some of this report's authors), examined the content and themes of e-cigarette marketing in a sample of UK national and local newspapers, trade press, tobacco industry journals, and television advertising between May 2012 and June 2013, plus data from five social networking sites (Facebook, Twitter, Tumblr, YouTube and Pinterest) used by seven leading e-cigarette brands over 40 days (de Andrade et al. 2013b). The study analysed the range of media and/or marketing channels used by e-cigarette manufacturers and retailers in the data-set, and looked at the range of promotional themes. This study found e-cigarette marketing strategies for two distinct groups: to general public consumers (including smokers) and to stakeholders, including retailers, policymakers and public health bodies. The strategy targeting the former used television advertising, sports and cultural sponsorship, celebrity endorsement, social networking, online advertising, point of sale displays, pricing strategies, and product innovation; the marketing strategies for the latter also included public relations activities and lobbying.

The analysis by Williams 2015a used data identified from online searches for information about past and upcoming consumer vaping conventions from around the world. Vaping conventions are aimed at users (to try products, share information and build links) and at e-cigarette manufactures and retailers (as an opportunity to promote and sell e-cigarettes directly to consumers and build a customer-base). Information for n=90 conventions was analysed by location, the number of sponsors/vendors, admissions cost, promotions and conference events. Thirty-four vape convention organizations were from the USA (82.9%), the other seven from Belgium, Canada, China, France, Germany, South Africa and the UK.

Of the three remaining content analyses, all were from the North America. One used commercial data (Kantar Media Intelligence) to look at both the physical composition and thematic content of USA print magazine adverts for cigarettes, cigars, e-cigarettes, moist snuff, and snus (Banerjee et al. 2015). Most of the e-cigarette magazine adverts were full page adverts (89%) and used 6 or more colours (85%). All the e-cigarette magazine adverts included an image of the product and clearly labelled the brand name. In terms of themes in the adverts, 89% of e-cigarette magazine adverts used comparative reasons to buy, 85% used conventional reasons to buy and 56% used the persuasive theme of masculine or feminine sex role model endorsement. A second study analysed a broader range of advertising channels via Competitrack and Mintel commercial data (including network, cable, spot and syndicated TV, trade magazines, newspapers, online, radio, outdoor, cinema, and opt-in e-mail advertising) for n=271 non-combustible tobacco products, including 27 e-cigarettes adverts in 2012 (Richardson et al. 2014). Content analysis of the print adverts only, found that magazines targeting mainly White males were selected by brand owners, but *blu* also advertised in magazines targeted to predominantly White females. The adverts featured White males and females more often than those of other races, and the thematic content analysis found similar themes to Banerjee et al. (2015). A later study by Richardson et al. (2015), used 2012-13 online e-cigarette banner and video adverts data from Canada and the USA to run an analysis of themes and characteristics of the adverts. E-cigarette adverts were found on 46 of the 250 websites monitored by Competitrack and were most often placed on music or entertainment websites (39.1%) or news websites (17.4%). Thematic analysis of the 24 unique advertisements for various brands of e-cigarettes found that most featured harm reduction (37.5%), use as a cessation aid (20.8%), being more environmentally friendly than cigarettes (54.2%) or being an alternative to cigarettes when someone cannot smoke (33.3%).

3.2.2.3 E-cigarette Pricing and Ad Spend

Eight studies were identified that examined pricing for e-cigarettes or advertising spend for e-cigarettes.

Data were collected between 2008 and 2014 and all eight studies were reported in peer-reviewed journal articles. Seven of the studies used data from the USA (Huang et al. 2014b, Kim et al. 2014, Kornfield et al. 2015, Cantrell et al. 2016, Giovenco et al. 2015, Banerjee et al. 2015, Loomis et al. 2016) and one was a multi-country (n=45) study, that included the UK (Liber et al. 2016).

Four of the studies examined the pricing of e-cigarettes. The first compared the price of e-cigarettes against cigarettes (combustible) in 45 countries using Euromonitor commercial data to run two-tailed comparison tests (Liber et al. 2016). The main finding of the study was that comparable units of tobacco cigarettes were cheaper than disposable and rechargeable e-cigarettes in most countries in the sample, both within the high-income countries group and within low-income and middle-income country groupings. However, the Euromonitor data demonstrated that the price positioning by the manufacturers and retailers of e-cigarettes in the UK reversed that trend. The UK was the only country in the sample of 45 where the median price of a disposable e-cigarette and the minimum price of a rechargeable cigarette in 2014, was lower than the weighted average price of a pack of regular tobacco cigarettes. Three other studies included in the review looked at the pricing of e-cigarettes, however the results of these are less relevant to the UK context. One, a modelling study used Nielsen USA data from 2009-12 examined average e-cigarette and cigarette prices and sales volume in particular markets, quarter-annuals and store types. The other two also used 2012-13 USA sales scanner data from commercial companies (Nielsen and Information Resources, Inc.) in time series analyses of pricing for e-cigarette starter kits and disposable e-cigarettes, and sales by brands, flavours and store-types. (See also Cuomo et al. 2015 in Section 3.2.2.4 a content analysis of online stores that also collected pricing data.)

Four studies analysed advertising spend for e-cigarettes in the USA across broadcast media, print media and online. Three time-series studies used data from commercial companies (Nielsen, Kantar Media and Competitrack). The earliest of the time-series studies analysed over one hundred e-cigarette brands for 2 years (Kim et al. 2014), between 2011 and 2012. The data showed that e-cigarette advertising expenditure had tripled over the time period from $6.4 million to $18.3 million, with spending concentrated in television and magazines rather than in newspapers and online. Following that, another time-series study examined the data from a longer time-period (Kornfield et al. 2015), between 2008 and 2013. The data demonstrated a rapid increase in e-cigarette promotional expenditures; the first two quarters of 2013 representing more than twice the expenditure for the previous year. The third looked at the spending and targeted media for two e-cigarette brands, *blu* and *MarkTen*, over the year 2014 (Cantrell et al. 2016) when the former was acquired by Imperial Tobacco and the latter was launched by cigarette manufacturer Altria. *MarkTen* had the highest total advertising expenditure of over $35 million after increasing spend throughout the year, and *blu* was second highest at $30 million, after demonstrating a fluctuating advertising spend over 2014. The fourth study to analyse advertising spend for e-cigarettes (Banerjee et al. 2015), concentrated on industry spending on print magazines adverts in the USA (using Kantar Media Intelligence data). The study reported that between August 2012 and August 2013, almost $40m dollars was spent on e-cigarette magazine adverts in the USA, with three-quarters spent by the brand *blu*. Spending on cigarette magazine adverts was more than double ($90m) that of e-cigarettes the same year. The same study also conducted a content and thematic analysis of the adverts (see Section 3.2.2.2, Banerjee et al. 2015).

3.2.2.4 E-cigarettes Marketing Online Retail

Eight studies were identified that examined the nature of e-cigarette marketing in online stores.

The content of much of the data analysed in these studies was often trans-national, however categorising the studies by country of the lead institution or funder, six were conducted in the USA (Cobb et al. 2015, Grana & Ling 2014, Zhu et al. 2014, Cuomo et al. 2015, Mackey et al. 2015 and Williams et al. 2015b), one each in Canada (Hammond et al. 2015) and Switzerland (Canevascini et al. 2015). In four of the USA studies that ran content analyses of retail websites whose main purpose to sell e-cigarettes, most of the included vendors were based in the USA but vendors from (or with links to) the UK, India, Australia, China, Hong Kong, Canada and Germany were also analysed. Data for the eight studies were collected between 2012 and 2015 and all were published in peer-reviewed journal articles.

All the studies used an observational design and were cross-sectional data captures. One study emailed a 3-item survey to Canadian online e-cigarette retailers and manufacturers, another conducted underage test purchases of e-cigarettes from online stores, a third ran a forensic analysis to examine online affiliate-based networks that stemmed from a single spam e-cigarette text message, email and e-cigarette banner ads. The other five studies were content analyses of online e-cigarettes stores. Dependent on the aim of the study, typical measures used by the studies to describe the nature of e-cigarettes marketing by the stores included: promotional messages (eg. benefits, quality, advice), sales promotion strategies, range of products for sale, age verification procedures, logos and marketing characteristics. Two of the studies were part of larger studies that ran complementary audits of physical (“bricks-and-mortar”) stores selling e-cigarettes (see Section 3.2.2.5).

One content analysis study of e-cigarette retail websites recorded marketing claims, website descriptors and e-cigarettes product descriptors from 59 websites in 2012 (Grana & Ling 2014). Most of the websites were in the USA (n=46), 11 were based in the UK, plus one each in India and Australia; however the findings were not reported by country. Regarding marketing themes, 95% of the websites made explicit or implicit health-related claims and 64% specifying a smoking cessation-related claim and one fifth featured doctors (22%). Three-quarters stated that e-cigarettes did not produce second-hand smoke (76%) and most compared them with cigarettes as being cleaner (95%) and cheaper (93%). Regarding advertising appeals, 73% of websites included images or claims of modernity, others included increased social status (44%), enhanced social activity (32%), romance (31%), and use by celebrities (22%).

The other data from a European country came from a cross-sectional audit of e-cigarette marketing and promotions data from 20 websites selling e-cigarettes, 19 with a Swiss domain name in 2014 (Canevascini et al. 2015). Seven of the sites offered nicotine e-liquids for sale, which was legal provided that the company headquarters were not based in Switzerland. The content of sales messages included the benefits of electronic cigarettes compared to conventional cigarettes (15 websites), the quality of the products and reference to studies or expert advice on electronic cigarettes (both 4 websites). Some of the websites, the total unreported, used logos or references associated with tobacco brands to promote their e-cigarette products.

3.2.2.5 E-cigarette Marketing in Shops

12 studies were identified on e-cigarette marketing in shops. Two studies were published in one paper (Rose et al. 2014) and one study was published in French (Canevascini et al. 2015).

Two studies collected data in the UK, one in London, England (Hsu et al. 2013) and one in four communities in Scotland (Eadie et al. 2015). One study collected data from Lausanne city-centre in Switzerland (Canevascini et al. 2015), and one from Vancouver, Toronto, Montreal and Halifax in Canada (Hammond et al. 2015). The other seven studies were from the USA, two with national samples (Rose et al. 2014 study 1, Rose et al. 2014 study 2), and one each in Los Angeles, California (Sussman et al. 2014), North Carolina and Virginia (Wagoner et al. 2014), seven counties in Ohio (Roberts et al. 2015), Madison and Clark Counties, Kentucky (Hahn et al. 2015), Central Harlem, NYC (Ganz et al. 2015) and Atlanta, Georgia (Dube et al. 2015). Data were collected between 2012 and 2014 and all eight studies were reported in peer-reviewed journal articles.

Eleven of the studies were field observations, where researchers visited samples of stores and completed an audit or checklist from viewing the exterior, interior or both of the stores. Some audits also took photographs and there was variation in whether the observations were covert or unconcealed. Two of these field observation studies ran a parallel audit with online e-cigarette stores (see Section 3.2.2.4). Nine of the eleven studies were cross-sectional with data collected during a single time period. One field observation study, from the UK, used a longitudinal design and collected baseline data in Spring 2013 and follow-up data 12 months later. Similarly, another, from the USA, took repeated cross-sectional data in Spring 2012 and 2013. The target sample of most of these studies were defined as tobacco retailers, or alcohol and tobacco retailers. One study used a sample of e-cigarette and e-hookah retailers near college campuses. The twelfth study was a cross-sectional analysis of 12-months' online reviews of "bricks-and-mortar" vape stores (from the Yelp business review website). Most of the measures collected in the studies related to the presence of different point-of-sale advertising and promotion, and to the availability of e-cigarette products.

In terms of the UK studies, Hsu et al.'s (2013) cross-sectional study involved researchers completing an audit tool for n=108 stores selling tobacco products and alcoholic beverages in London, between June and July 2013. Data were collected on whether stores sold e-cigarettes, and whether advertising and point-of-sale displays were visible in the stores. Fifty-seven percent of the stores visited over the 3 weeks sold e-cigarettes (n=62); 53 of the 96 small stores (55%) and 9 of the 12 large stores (75%). There was no significant difference in in availability between small stores (<280m^2) and large stores (≥280m^2, p=0.115). Interior and exterior advertisements for e-cigarettes were recorded in stores (in 2% and 15% respectively), all in smaller stores. Half of the 62 stores that sold e-cigarettes had a point-of-sale movable display (50%), with all but one of these being in small stores.

A longitudinal study from the UK took place in four contrasting communities in Scotland (Eadie et al. 2015). Baseline measures were taken during a 3-month period in 2013 and follow-up measures in 2014. A discreet audit, including a token purchase, was conducted in 96 stores licensed to sell tobacco, comprising supermarkets, CTNs (confectioners-tobacconists-newsagents), grocery/convenience stores, petrol stations/garage forecourts, off-licences and fast food/take-away outlets. The audit collected data on the presence of e-cigarette availability in the tobacco retail outlets and any advertising and promotion. Interviews with retailers and a collection of marketing materials and photographs were also part of the study. The study found that the number of tobacco retail outlets with purpose-designed display units for e-cigarettes increased from 21% (n=20) to 49% (n=47) over the two waves (w) (p<0.001). At both stages, free-stand towers were the most popular type of display design (w1 7%, w2 30%), compared to trays (w1 1%, w2 20%), hangers (w1 5%, w2 3%) and other/unspecified (w1 7%, w2 2%). Display units for *E-Lites* (9%) and *Nicolites* (8%) were the most common at wave 1, with four other brands achieving similar prominence by wave 2: *SkyCig* (15%), *OK* (11%), *10 Motives* (18%) and *Njoy* (13%). The mean number of brands displayed, per outlet, increased from 0.21 at wave 1 to 1.5 at wave 2 (p<0.001). The number of tobacco retail outlets with any e-cigarette external ads on the shop fascia remained constant at 10 (10%) at both waves, although the range of different brands advertised externally extended from 3 at wave 1 to 9 at wave 2.

Some data were only collected at wave 2 of the study (Eadie et al. 2015). In 2014, 77% (n=74) tobacco retailers stocked at least one e-cigarette brand, with a mean of 1.5 (±1.31) brands stocked per store across the sample. The maximum number of brands stocked by any one store was 6 and a total of 31 separate brands were observed across the sample. Fifteen percent (n=14) shops carried at least one item of in-store promotional material for e-cigarettes; including change mats (6%), in-store posters (5%), leaflets (3%) and dangler ads (2%). 36% of the outlets (n=35) positioned e-cigarettes immediately adjacent to at least one product of potential interest to children and young people, the most frequently observed being confectionery (n=20, 21%), collectible cards (n=10, 10%), and mints and gum (n=9, 9%). Promotional material for e-cigarettes was only observed in off-licences, grocers/convenience stores and CTNs, with no promotional materials observed in super-markets, petrol stations or fast food outlets. While all supermarkets stocked e-cigarettes, none of the fast food outlets stocked them.

Of the other studies conducted outwith the UK, the cross-sectional study by Canevascini and colleagues (2015) was the only other in a European country. Researchers audited e-cigarette marketing and promotions data, also in 2014, from the interiors and exteriors of retail stores in Lausanne city-centre in Switzerland. Most of the recorded e-cigarette advertising was posters, displays or stickers, located either inside or outside 37.5% (18 of 48) of the retail outlets, predominantly in kiosks and outlets specialising in e-cigarettes, with very little recorded at pharmacies. 60% of the audited kiosks positioned electronic cigarettes near confectionary. In general, the kiosks (n=20) “often” positioned e-cigarettes for sale alongside regular cigarettes and the pharmacies (n=18) presented e-cigarettes alongside pharmaceutical products. During the study period, the marketing of electronic cigarettes with nicotine was banned in Switzerland, and those without nicotine had the legal status of 'standard products' and were subject to the law on foodstuffs. It was unclear from the paper whether the observed marketing pertained to e-cigarettes without nicotine only.

One other study of e-cigarette marketing in shops used follow-up measures. Wagoner and colleagues’ (2014) repeated measures study visited North Carolina and Virginia tobacco retailers in Spring 2012 and Spring 2013, but restricted it to those surrounding 11 college campuses. The audit found a significant increase in the number of retailers that sold at least one brand between the two time points, and the presence of interior and exterior advertising also significantly increased, but there was no significant increase in price promotions. The remaining studies from the USA were cross-sectional/snapshots so less relevant to this report.

3.2.2.6 Summary

In this section we outlined findings from studies that examined the nature of e-cigarette marketing, rather than how individuals respond to this marketing. We found that there is a considerable recent literature on the type, location, frequency and content of e-cigarette marketing and some data on spending on advertising and the price of products. Relatively few studies, just four, were conducted in the UK but a number of studies focused on marketing that can be accessed from the UK, such as YouTube videos or social media sites.

In relation to *social media*, seven studies focused on examining the content of YouTube videos. A UK study of YouTube focused on 110 UK chart music videos from 2013 to 2014. Relatively little e-cigarette branding or e-cigarette use (or implied use) was found. E-cigarette branding was only seen in one of the 110 videos, actual use in two, and implied use in two.
When looking at YouTube videos more broadly, however (not just music videos), e-cigarette content was prevalent and in one study over half of available videos with e-cigarette content were classified

as advertising. However on closer inspection in one study of 365 videos with e-cigarette content between 2007 and 2011, only 8.8% were formal adverts with the majority assessed as having promotional content that was user generated.

There were a number of studies of Twitter exchanges about e-cigarettes and overall, they show that e-cigarette content is available on Twitter and that a lot of the tweets are commercial and promotional in nature – one study estimated around 86% of tweets about e-cigarettes were commercial in nature, while a more recent study found 48% were commercial and 35% non-commercial tweets. However, a study looking at Twitter accounts (rather than individual tweets) found that just 7.7% of tweets were from retailers and 1.97% from manufacturers, with the remainder from individual users or vaping community/advocacy sites and groups.

Beyond social media, five further studies looked at the content of marketing: across a range of channels (from print media, TV, social media); through consumer vaping conventions; in magazines and other print and broadcast media in the USA; and online through banner and video adverts in Canada and the USA. These studies are very difficult to summarise together given the wide range of content they examined. Overall they found a wide variety of different types of marketing at the time they were conducted and that, unsurprisingly, different types of marketing targeted different audiences. Some types of marketing covered in these articles are now prohibited in the UK as we describe in the final Section (3.3) of this report – making this historical literature less relevant than if all marketing channels and options continued to exist.

On *ad spend and pricing*, four studies looked at the price of e-cigarettes (pricing is part of the marketing 'mix' and can be a marketing tool) and four examined advertising spend. Three of the pricing studies looked within the e-cigarette sector at different prices but one compared these across countries in Europe with tobacco cigarettes. This included 2014 data and found that tobacco was cheaper than disposable and rechargeable e-cigarettes in most countries in Europe except the UK where e-cigarettes had the price advantage. The ad spend studies were all from the USA, but two included trend data and found that spending on e-cigarette advertising grew between the years that were compared (2011-2012 in one study and 2008-2013 in the other).

For *e-cigarette retail (sales) marketing online*, eight varied studies from the USA, Canada and Switzerland were identified. Some looked at the content of promotions for retail sales online, while others looked at the range of products for sale and how sales were promoted. The studies of promotional messages are not terribly relevant to the UK where the CAP code and now the TPD (see later in this report) prohibit particular messages like effectiveness for smoking cessation or other health claims. In terms of broader marketing, approaches were used which are similar to some other categories of consumer products like using messaging that appeals to social status, social activities, romance or celebrity endorsement. One Swiss study found that e-cigarette online retain websites with Swiss domain names did link e-cigarettes to tobacco brands, but as we outline later in this report this type of promotion is now banned in Europe.

For *e-cigarette marketing in shops*, twelve studies were identified including two in the UK. The key messages here from both the UK and non UK studies were that in those studies that collected data over two years (2012 and 2013 in a US study, and 2013 and 2014 in a UK study in Scotland) found that the prevalence (number of retail outlets) and nature (extent of displays in shops) increased between the two time points. Also that e-cigarette point of sale displays were positioned near products that children could be interested in (ie. sweets, gum). Also both UK studies looked at whether retailers that sold tobacco also sold e-cigarettes and found that many did (49% of tobacco retailers included in the Scottish study in 2014). The overall picture from the retail marketing studies was that e-cigarette promotion at the point of sale is prevalent in a range of types of retailers including in the UK.

3.2.3. The Effects of E-Cigarette Marketing on Children

Nine studies were identified that examined any perceived or actual effects of e-cigarette marketing on children (≤18 years).

Two of these studies were conducted in the UK (Ford et al. 2015, Vasiljevic et al. 2016), one in Finland (Kinnunen et al. 2014) and six in the USA (Anand et al. 2015, Duke et al. 2014, Farrelly et al. 2015/Duke et al. 2015, Singh et al. 2016, Krishnan-Sarin et al. 2015, Bar et al. 2015). Data were collected between 2012 and 2014 and eight studies were reported in peer-reviewed journal articles (one in two separate papers Farrelly et al. 2015 and Duke et al. 2015), the ninth in a conference abstract published in a peer-reviewed journal. Seven studies were observational designs: six used a cross-sectional design (3 classroom surveys, 1 online/internet panel survey, 1 postal survey and 1 in-home survey) and one was a time-series analysis. Two studies used an experimental design.

None of the nine included studies surveyed any children under the age of 11 years, and seven studies only restricted their samples by age and no other traits. The two experimental studies looked at teenage populations with specific e-cigarette attributes; one tested only individuals who had never used an e-cigarette (Farrelly et al. 2015/Duke et al. 2015) and the other only tested individuals who had neither smoked nor ever used an e-cigarette (Vasiljevic et al. 2016). The findings of the studies are presented by their measures of e-cigarette marketing:

- Recall by advertising channels
- Overall exposure to TV advertising
- Recall by other promotional channels
- Where e-cigarettes were purchased or procured
- Brand awareness

Finally we describe findings from the experimental studies with young people on e-cigarette marketing. This is followed by a summary of the child studies.

3.2.3.1 Recall of advertising channels for e-cigarettes

Six cross sectional surveys measured the channels of e-cigarettes marketing that children could recall in the UK, Finland and the USA.

A study with n=1,205 11-16 year olds across the UK in 2014 (funded by Cancer Research UK and co-authored by some of this report's authors), found that 40% were aware of e-cigarette adverts on television, 32% were aware adverts on posters or billboards, 24% reported seeing adverts in newspapers or magazines and 10% had heard e-cigarette adverts on the radio (Ford et al. 2015).

A postal questionnaire with n=3,535 12, 14, 16 and 18 year-olds in Finland in 2013 found that 10.5% had seen an e-cigarette advertisement in Finland during the previous month (Kinnunen et al. 2014). Finland had already implemented an advertising ban (direct and indirect marketing) with only point of sale marketing allowed. When asked where, 21.8% (of the n=335 who had seen an advert) had seen them on Facebook, 41.4% on other internet pages; 14.7% in shops; 7.4% in magazines or on television; 4.9% in the street and 7.1% elsewhere. Two logistic regression models were presented. The first model adjusting for age and sex found that e-cigarette experimentation ('tried once or twice') was positively associated with exposure to any form of e-cigarette advertisement in the past month (OR 1.54 95% CI 1.19-1.99). The second model (which adjusted for all variables, ie. including a range of tobacco

variables like smoking status, parental smoking status, positive attitudes towards tobacco), found exposure to e-cigarette advertising was not associated with e-cigarette experimentation.

The remaining studies that assessed recall of e-cigarette advertising channels were from the USA. Seventy percent of n=1,166 Middle School (6^{th}-8^{th} grade) students and 61% of n=3,164 High School (9^{th}-12^{th} grade) students in Connecticut in 2013 reported recently seeing some form of e-cigarette marketing (Krishnan-Sarin et al. 2015). Asked "Where have you recently seen advertisements or e-cigarettes being sold?" and "Where have you recently seen advertisements on social media for e-cigarettes?", students reported a variety of locations: TV, gas stations, magazines, tobacco shops, mall kiosks, billboards, Facebook, Twitter, YouTube, Pinterest, Google, other. Gas stations was the most common source (38% Middle School 36%, High School) followed by TV (32% Middle School, 29% High School) and magazines (21% Middle School, 19% High School).

Rather than asking respondents to recall advertising channels, a classroom-administered questionnaire with n=2,769 High School students (grades 9-12) in North Carolina in 2013, asked respondents to recall how they found out about e-cigarettes (Anand et al. 2015). Most of the High School students were aware of e-cigarettes (77.3%), with most reporting to have heard about them from television advertisements (53.2%), followed by retail stores/gas stations (14.3%), friends (13.6%), family members (7.1%), print advertisements (4.9%), and the Internet (4.4%).

A secondary analysis of data from the large-scale 2014 NYTS relating to e-cigarette advertising channel recall, looked at a nationally representative sample of USA High and Middle school students (n=22,007) (Singh et al. 2016). Students were asked how often they saw advertisements or promotions for e-cigarettes in four 'channels': the internet; newspapers or magazines; convenience stores, supermarkets, or gas stations; and TV or when they go to the movies. 66.4% of Middle School students and 70.9% of High School students reported that they had seen e-cigarette advertisements or promotions from at least one of the four sources. Among Middle School students, the most frequent sources were retail stores (52.8%), the internet (35.8%), TV and movies (34.1%), and newspapers or magazines (25.0%). Among High School students exposure occurred most often in retail stores (56.3%), followed by the internet (42.9%), on TV or in movies (38.4%) and in newspapers or magazines (34.6%). Exposure was significantly higher among students in higher grades (ie. older students) for all sources ($p<0.05$). There were other sub-group differences for gender and race/ethnicity ($p<0.05$): exposure on the internet and in newspapers or magazines was reported more frequently by female students than male; and exposure in retail stores was higher among non-Hispanic whites than non-Hispanic blacks (blacks) and students of other non-Hispanic races/ethnicities; and exposure from TV and movies was higher among blacks and Hispanics than whites. For all the students questioned, more than one in five reported that they had seen e-cigarette advertisements or promotions from at least one of the four sources (22.1%), 17.2% from two sources, 14.1% from three sources, and 15.4% from all four sources.

The most recent findings were from an online panel survey with 200 9^{th} and 12^{th} grade students in 2014 (Bar et al. 2015). The authors reported that 59.5% of the students reported seeing advertisements at liquor stores and 55.4% at gas stations. A separate question about advertisements for e-cigarettes on the internet found that 21.6% had seen them on Instagram, 18.9% on YouTube, 18.9% on Google ads and 13.5% on Facebook.

3.2.3.2 Overall exposure to TV advertising

Duke et al. (2014) examined time series data (Nielsen Monitor-Plus) for commercial advertising reach over the time period of January 2011 to September 2013 to assess the extent to which youth aged 12

to 17 years in the USA were exposed to e-cigarette television advertisements. The data were TRPs (target rating points), a commercial measurement for advertising to a specified audience calculated as a function of reach (the proportion of people exposed to an advertisement) and frequency (the number of times an advertisement is potentially viewed).

Duke et al. (2014) reported that exposure to television e-cigarette advertisements increased for 12-17 year-olds by 256.0% from January 2011 to September 2013. Regarding television media types, 75.5% of all USA e-cigarette advertising exposure to youth occurred on cable networks; 11.9% was on network television; 12.1% was spot (local) television advertising; and 0.5% was on syndicated television. E-cigarette advertisements appeared on programs that were among the 100 highest-rated youth programs for the 2012-2013 viewing season. The majority of exposure was by one e-cigarette brand (*blu eCigs*), which accounted for 81.7% of all nationally aired TRPs directed at 12-17 year-olds in the first three-quarters of 2013. The next leading brands (*FIN* and *Starfire*) accounted for 7.1% and 6.2% respectively of exposure to this age-group. *NJOY* and Other brands accounted for 2.7% and 2.3% of exposure. In contrast to the high levels of national advertisements by one major brand, there was a greater variety of brands at local level (spot) e-cigarette television advertising. Nineteen companies aired advertisements locally over the study period.

3.2.3.3 Recall of other promotional channels for e-cigarettes

There was a modest amount of data on recall of marketing via other promotional channels measured in the included studies. This covered awareness of e-cigarette sponsorship, promotion by public figures, price promotions and point of sale. Ford et al's (2015) study measuring 11-16 year old's recall of e-cigarettes promotional channels in the UK, reported that 4% recalled having seen sports or games sponsored by an e-cigarettes company or brand and 15% of the sample could recall seeing pictures of actors or public figures using or promoting e-cigarettes. A higher proportion was reported by a similar age group (9th and 12th grade pupils), the same year, in a national US survey: 44.6% reported seeing a celebrity using an e-cigarette in a movie or on TV (Bar et al. 2015). Ford and colleagues' study was the only one in our sample to measure recall of price promotions (rather than promotions more generally): in 2014, one fifth (20%) of the teenage sample from across the UK recalled seeing special price offers for e-cigarettes (Ford et al. 2015). The UK study also found that the most common marketing channel for e-cigarettes that 11-16 year olds could recall was 'e-cigarettes being displayed in shops'. Shop displays were recalled by 73% of the sample. Most of the children surveyed (82%) were aware of at least one type of e-cigarette promotion, with an average of 2.47 channels mentioned (SD=1.93).

3.2.3.4 Recall where e-cigarettes were purchased or procured

Where surveys asked self-reporting e-cigarettes ever users to recall where they purchased or procured e-cigarettes, those that recounted commercial sources are reported here; three USA studies and one from Finland.

A classroom-administered questionnaire in 2013 in North Carolina with n=2,769 High School students (grades 9-12) (Anand et al. 2015) identified two commercial sources reported as accessible for e-cigarettes by high school students – tobacco stores (23.5%) and gas stations (17.2%) – although e-cigarettes were reported to be most accessible from friends (35.9%). Reporting is unclear, but it is presumed that ever e-cigarette users (15.2%, including 7.4% past-30 days users) were asked this question.

A small online panel study in 2014, asked where 9th and 12th grade High School e-cigarette ever-users got these items the last time they used them (n=200). 41.7% purchased them from a smoke shop and

43.8% reported getting them from a friend (Bar et al. 2015). The study authors stated that these were preliminary results and the number or percentage of the sample who declared having tried an e-cigarette was not reported.

Krishnan-Sarin et al. (2015) used a classroom survey to assess e-cigarette sources of access amongst middle (n=1,166) and high school students (n=3,164) in Connecticut, in 2013. n=41 Middle School and n=912 High School ever users of e-cigarettes responded to the question asking where they 'usually get e-cigarettes'. Among the small sample of Middle School students, most answered friend (39%) parent or adult (17%), followed by commercial sources, given as gas station (12%), online (5%), tobacco shop (7%) and mall kiosk (2%). Among the larger High School sample, most usually got their e-cigarettes from a friend (47%) followed by commercial sources including tobacco shop (14%), gas station (13%), online (4%), mall kiosk (3%), then parent or adult (6%). (Twelve percent of Middle School and 4% of High School answered 'Other' sources.)

In Finland, in 2013, a postal questionnaire completed by n=3,535 12, 14, 16 and 18 year-olds established sources of e-cigarettes via an open-ended question: 'If you have used electronic cigarettes, where did you get them?' (Kinnunen et al. 2014). The 29 different responses from n=517 e-cigarette ever users were categorised into six sources. Most reported friends as a source (79.9%), but some commercial sources were also reported: the internet 7.2%, family 5.0%, abroad 3.3%, shop 1.7% or another place 4.1%.

3.2.3.5 E-cigarette brand awareness/recognition

One study (the Cancer Research UK funded Youth Tobacco Policy Survey), sampling a random selection of households from a range of geographic areas and socio-demographic backgrounds from the UK in 2014, measured 11-16 year-olds' e-cigarette brand awareness using a face-to-face in-home questionnaire (Ford et al. 2015). Initially, brand recall was assessed by asking participants to name brands of e-cigarettes that they had heard of. Secondly, brand identification was assessed by showing a visual prompt with images of three brands of e-cigarettes (*Nicolites*, *Blu* and *E-lites*) with the brand name masked and asking them to name each brand. Thirdly, brand recognition was assessed by showing a visual of the same three brands of e-cigarettes, but with the brand name unmasked, and asking if they had seen each before (Yes/No/Not sure). Brand awareness amongst 11-16 year-olds in this survey was low; most (84%, n=1004) were unable to recall (unaided) any e-cigarette brands. Sixteen percent (n=189) were able to name one brand of e-cigarettes, while less than 1% (n=9) could name two. The brands with the highest recall were *E-lites* (8%, n=100), *Nicolites* (2%, n=22) and *blu* (2%, n=27). When shown images of packs with the brand name masked, only 1% (n=7) correctly identified *Nicolites*, fewer than 1% (n=1) identified *E-lites* while none identified *blu*. When shown images of the packs with the brand name visible, one-third recognised *Nicolites* (33%, n=399) and *E-lites* (31%, n=375), while 17% (n= 210) recognised *blu*.

3.2.3.6 Experimental studies with adolescents examining e-cigarette marketing

Two studies with an experimental design aimed to look at the impact of e-cigarette advertising on under 18-year-olds', who had never used e-cigarettes, attitudes and intentions towards them. The first paper and pencil experiment was run in two schools in England with 11-16 year olds in 2015 (est. date) (Vasiljevic et al. 2016), the second experiment was run online with a USA internet panel of 13-17 year olds in 2014 (Farrelly et al. 2015/Duke et al. 2015).

Using a between-subjects design, Vasiljevic and colleagues (2016) exposed n=471 participants self-reporting as never having smoked or used e-cigarettes to one of three conditions: flavoured

(participants were shown a booklet containing 12 images of adverts for candy-like flavoured e-cigarettes), non-flavoured (booklet contained 12 images of adverts for non-flavoured e-cigarettes, and control (booklet contained no adverts). Those who saw the flavoured e-cigarette adverts rated the adverts (not the product) as significantly more appealing, and expressed greater interest in buying and trying the advertised e-cigarette, compared with those who saw the non-flavoured e-cigarette adverts ($p \leq 0.005$). Across the three experimental groups, appeal of using e-cigarettes (assessing their attractiveness, 'coolness' and whether boring or fun) and appeal of trying tobacco smoking were similarly low, while perceived harm of smoking tobacco cigarettes were similarly high (all p values >0.376). Finally, logistic regression analyses contrasting the effects of the three conditions on susceptibility to tobacco smoking (eg. accepting and smoking a cigarette from a friend, or imagining their future 18-year-old-selves to be a smoker) yielded no significant results (all p values >0.441).

The findings from the second experimental study were reported in two papers (Farrelly et al. 2015/Duke et al. 2015). Also a between-subjects design, n=3,665 participants self-reporting as never having used e-cigarettes were exposed to one of two conditions. The cue condition group viewed and rated four e-cigarette adverts, then completed the questionnaire. The control condition group completed the questionnaire first, then viewed and rated the same four adverts. The adverts had aired on US television in 2013 and 2014 and previously received high youth ratings on likability and perceived effectiveness. Attitudes towards using e-cigarettes were significantly more positive ('enjoyable', 'healthy', 'safe', 'fun', 'smart', 'cool', 'attractive') amongst the group who viewed the e-cigarettes adverts before answering, than amongst the control group ($p<0.001$). This group was also less likely to rate e-cigarettes as harmful or very harmful than the control group (OR=0.84, p=0.009). There was no significant difference in attitudes towards using tobacco cigarettes or in how they rated the harmfulness of tobacco cigarettes between the two groups. Adolescents in the cue condition group reported a greater likelihood of trying an e-cigarette soon (OR 1.45, $p<0.01$), trying an e-cigarette anytime during the next year (OR 1.43, $p<0.01$), and using an e-cigarette if one of their best friends offered one (OR 1.29, $p<0.05$). Those in the cue condition group were also significantly more likely than the control group to agree with statements corresponding to the adverts' prominent marketing messages, such as that e-cigarettes can be used in places where smoking is not allowed(OR=1.71, $p<0.001$); that people can use e-cigarettes without affecting those around them (OR=1.83, $p<0.001$); that using e-cigarettes is a good way to express your independence (OR=1.90, $p<0.001$); that e-cigarettes are a safer alternative to regular cigarettes (OR=1.19, $p<0.01$) and are less toxic than ordinary cigarettes (OR=1.16, $p<0.03$) (Farrelly et al. 2015). Additionally, amongst the cue condition group, intention to use e-cigarettes was more than twice as high among youth with higher perceived ad effectiveness scores (worth remembering, attention grabbing, powerful, informative, meaningful, convincing) compared with those with lower scores (Duke et al. 2015).

3.2.3.7 Summary

This section outlined findings from nine studies that examined how children (11-18 years) respond to e-cigarette marketing. Most of the studies were conducted in the USA. Only two studies were conducted in the UK. Within the literature there was considerable focus on children's recall of advertising and a smaller amount of data on recall of other promotional channels, where children procured e-cigarettes and e-cigarette brand awareness. Seven studies were observational designs. Two experimental studies provided data on the impact of e-cigarette advertising on children's attitudes.

All the studies examining recall were cross-sectional designs. Often e-cigarette marketing recall was not the focus of the studies, with recall captured by only one or two survey items. In relation to *advertising channel recall* the studies show that this age group are aware of e-cigarette advertising

and via multiple channels, including: on TV, posters, billboards and the internet, and in newspapers, magazines and shops. Awareness of advertising appears to be generally higher in the USA than that reported in a UK study. Indeed, a time series analysis conducted in the USA, showed 12-17 year olds exposure to e-cigarette TV advertisements increased by 250% between 2011 and 2013. Few studies analysed data by subsamples or explored variables for correlations. Exceptions are a study conducted in Finland that found some age, gender and race differences in ad recall, and a US study which found e-cigarette ad exposure was not associated with e-cigarette experimentation.

Beyond advertising, few studies explored recall of a more extensive range of promotional channels. Similarly, only one study explored e-cigarette brand awareness. In a UK study, a large proportion (73%) of the sample recalled shop displays of e-cigarettes. One fifth could recall price promotions while only a small number (4%) could recall seeing sports or games sponsorship. In the same study, e-cigarette brand awareness among 11-16 year olds was found to be very low, with most respondents (84%) unable to recall (unaided) any e-cigarette brands. Only one study from the USA explored a further promotional channel 'seeing a celebrity using an e-cigarette in a movie or on TV'. Again the study reported a higher level of awareness among children than a similar measure in the UK study 'pictures of actors or public figures using an e-cigarette' (44.6% compared with 15%).

For *where e-cigarettes were purchased or procured,* four studies asked self-reporting ever e-cigarette users where they obtained e-cigarettes. Three studies from the USA and one from Finland recounted commercial sources of access, the most common of which were tobacco shops and gas stations; the extent to which children reported purchasing e-cigarettes online was low (4-7%). By far the most popular way to obtain e-cigarettes was through a friend (35-47% in the US studies).

Two *experimental studies* were identified, including one conducted in the UK which focused on the impact of flavoured e-cigarette advertisements on appeal. Those who were exposed to flavoured, compared with non-flavoured, e-cigarette adverts rated the adverts as significantly more appealing. However, this finding appears to be related to content of the adverts rather than the appeal of e-cigarettes. There was no difference in the appeal of using e-cigarettes between the experimental groups and no association was found between advert condition and susceptibility to tobacco smoking. The second experimental study from the USA examined the impact of e-cigarette ad exposure on teenagers' attitudes towards e-cigarettes and tobacco cigarettes. Those exposed to adverts before filling in a questionnaire reported significantly more positive attitudes, and greater likelihood of trying e-cigarettes than those who filled in the questionnaire first. However, there was no significant difference in attitudes towards using tobacco cigarettes.

3.2.4 The Effects of E-Cigarette Marketing on Adults

Twenty-two studies were identified that used a sample of adults (≥18 years). Four of these also included adolescents from age ≥15/≥16 years.

None of the studies were conducted in the UK, 2 were conducted in Canada (Czoli et al. 2014, Shiplo et al. 2015), 2 in New Zealand (Li et al. 2014/Li et al. 2015a, Li et al. 2015b), 1 in the Netherlands (Nagelhout et al. 2016) and 17 in the USA (Baumann et al. 2015, Duke et al. 2014, Kim et al. 2015b, King et al. 2016, Maloney & Cappella 2015, Pepper et al. 2014a, Pepper et al. 2014b, Pepper et al. 2014c, Pepper et al. 2014d, Piñeiro et al. 2016, Pokhrel et al. 2015, Sanders-Jackson et al. 2015, Smith et al. 2015, Tan et al. 2015a,b, Trumbo & Kim 2015, Villanti et al. 2015, Wackowski et al. 2015). Data were collected between 2012 and 2014 and all 22 studies were reported in peer-reviewed journal articles (two studies in two separate papers: Li et al. 2014 and Li et al. 2015a, and Tan et al. 2015a and Tan et al. 2015b). Fifteen studies were observational designs: 13 used a cross-sectional design (10

online/internet panel survey, 1 telephone panel survey and 2 in-home survey); 1 was a longitudinal design (via an online/internet panel); and 1 was a time-series analysis. Seven studies used an experimental design. *We summarise these all here with the caveat that as there are no UK studies, some elements of this literature will not be directly relevant to the UK.*

The findings from observational studies are reported first in this section, organised by their e-cigarette marketing measures:

- Recall of advertising channels
- Overall exposure to TV advertising
- Recall of other promotional channels
- Receptivity to e-cigarette advertising and promotions
- Recall of e-cigarette brands

Finally we describe findings from the experimental studies on e-cigarette marketing. This is followed by a summary of the adult studies.

3.2.4.1 Recall of advertising channels for e-cigarettes

Eight observational studies assessed adult recall of advertising channels for e-cigarettes. The studies asked where participants had seen e-cigarettes advertised; six included a frequency measure, asking how often they had seen adverts. The studies included five online surveys from the USA, one online survey from Canada, one telephone survey from New Zealand and one longitudinal study from the Netherlands. The studies are organised here by their target adult populations: young adults (defined by ages ranging from 16-40 years), adult smokers and more general adult populations.

Young adults' recall of advertising channels for e-cigarettes

Three cross-sectional online panel surveys with young adults assessed recall: one from Canada and two from the USA which also assessed frequency.

An internet panel with a Canadian sample of 16-30 year-olds (n=1,188), asked respondents in July 2012 whether they had ever seen e-cigarettes advertised or for sale (one question) (Czoli et al. 2014). (The online survey provided a picture of an e-cigarette.) Over two-fifths (43.4%) of respondents reported having seen e-cigarettes advertised or for sale at one or more of the following locations: on the internet (24.3%); in Canada at a regular store, such as a corner store or gas station (23.1%); outside of Canada (9.5%); or elsewhere (8.6%).

Pokhrel et al. (2015) asked a sample of 18-40 year-old undergraduates (n=307) from community colleges in Hawaii in September and October 2013 to recall how often they had seen e-cigarette adverts across each of the following marketing channels: newspapers, magazines, the internet, television, billboards, sporting or cultural events, convenience stores, gas stations, grocery stores, and malls on a 4-point scale ranging from never to often, plus an open-ended "other" option. Fifty-eight percent of participants reported having seen e-cigarette ads "sometimes" or "often" on TV, 59% on the Internet, 71% in malls, 44% in magazines, 28% in newspapers, 41% in gas stations, and 47% in convenient stores. Approximately 90% of participants reported being exposed to some form of e-cigarette marketing "sometimes" or "often". Those who self-reported having ever used an e-cigarette, were more likely to report higher exposure to e-cigarette marketing than those who never used an e-cigarette (mean score 23.7 SD±7.0 vs 21.4 SD±7.1, $p<0.01$).

In March 2014, a nationally representative sample of 18-34 year-olds in the USA, were asked how often they had seen adverts for e-cigarettes in the past 30 days in four locations (convenience store, liquor store, or gas station; when using social media such as Facebook, Twitter or YouTube; while watching television or cable shows; and when reading newspapers or magazines), and gave them four possible responses ranging from never to five or more times (Sanders-Jackson et al. 2015). Using a median split, the sample was split into those reporting higher and lower marketing exposure. Respondents' knowledge about constituents, and regulation, of e-cigarette products was also tested with two statements for each requiring a true, false or 'don't know' response. Those with higher marketing exposure were less likely to answer 'don't know' to items testing their knowledge on constituents and regulation ($p<0.001$) than those with lower marketing exposure. Those reporting a higher level of exposure to e-cigarette marketing were, however, also more likely to respond incorrectly to the true statement "Some e-cigarettes contain nicotine" (RRR=1.12, $p=0.031$) than those with a lower marketing exposure.

Adult smokers' and former smokers' recall of advertising channels for e-cigarettes

Three surveys with adult smokers (and some former smokers) asked them to recall where, and how often, they had seen e-cigarettes advertised. The first survey, from the Netherlands, repeated the survey measures 1 year later.

An online longitudinal panel survey by Nagelhout et al. (2016) in the Netherlands measured adult (≥16 years) current smokers' recall of seeing e-cigarette advertising over the previous 6 months in three sources, with baseline data collected in May and June 2013 and follow-up data in May and June 2014 (n=1198 respondents competed both surveys). Noticing e-cigarette advertisements in the previous 6 months increased significantly from 13.3% in 2013 to 36.0% in 2014 ($p<0.001$). Regarding specific advertising channels, recall of noticing e-cigarette advertising in the previous 6 months increased significantly from 2013 to 2014 on television from 6.6% to 27.4%, on radio from 1.4% to 4.0% and in print from 8.2% to 16.7% ($p<0.001$). In a series of regression analyses, no association was found between noticing e-cigarette advertisements and starting ever use (OR=0.86, $p=0.332$) or current use (OR=0.85, $p=0.458$) of e-cigarettes between baseline and follow-up. Noticing e-cigarette advertisements was associated with more disapproval of smoking (Beta=0.05, $p=0.019$) and with quit attempts (OR=1.37, $p=0.038$), but not after adjustment to the multivariate model; when there was no association between noticing e-cigarette advertisements and quit success (OR=0.92, $p=0.807$).

In a telephone panel survey from New Zealand, conducted between August and December 2013, 48.9% of current smokers and recent quitters (n=267) reported seeing advertising for e-cigarettes within the previous fortnight (Li et al. 2014/Li et al. 2015a). Among those who reported seeing an advert (n=128), television was the most frequent advertising channel (78%), followed by radio (13%), the internet (8%), in-store advertising (6%) and in newspapers (2%). Examining the responses by quitting behaviour, the researchers found that 39.3% of daily smokers (non-attempters), 55.0% of daily smokers (recent quit attempters) and 51.7% ex-smokers (serious quitters) reported seeing advertising of e-cigarettes in the previous two weeks. The adjusted model (adjusted odds ratio) comparing responses, showed that overall exposure to e-cigarette advertising did not differ by smoking and recent quit attempt status, ever-use of e-cigarettes or any sociodemographic variables that were included in the model. Further analysis of the data from those who had never used an e-cigarette (n=172) on their susceptibility to e-cigarette use, found that 43.8% of never e-cigarette users in the sample self-reported that they had 'past two-week exposure to e-cigarette advertising', however the exposure to advertising variable did not predict susceptibility to e-cigarettes for never users in the adjusted model (Li et al. 2015a).

Baumann et al's survey looked at a specific hospitalised population of adult (19-80 years) current smokers in Alabama, USA in relation to their exposure to e-cigarette advertising over the previous 6 months (Baumann et al. 2015). Data were collected face-to-face over the period December 2012 to September 2013 and results were reported by race (Black or White hospitalised smokers). Over the 9-month study period, Whites reported 56% higher exposure to e-cigarette advertising than Blacks (mean=25 vs. 8 in the first month to mean=79 vs. 45 in the final month, respectively; $p<0.0001$). Adjusting for demographic variables and smoking behaviours, Whites patients' exposure to e-cigarette adverts was 33% higher, on average, than Blacks' exposure ($p<0.0001$). White and Black patients reported seeing e-cigarette adverts in different settings: radio/television and stores were the largest source of e-cigarette ad exposure for both groups; more White patients than Black patients reported encountering advertisements in stores (40% vs. 34%, $p=0.03$) and on the internet (13% vs. 6%, $p=.0005$); and a higher proportion of Black patients than White patients reported exposure to radio or television adverts (73% vs. 67 %, $p=0.03$); exposure to adverts in newspapers or magazines did not differ between the racial groups ($p=0.65$). There was a rising trend during the 9-month study period for the number of reported e-cigarette advertisement exposures for the previous 6 months with an average 14% increase each month of the 9-month period ($p<0.0001$); the increasing rate was significantly greater for White patients compared to Black patients ($p<0.001$). The association with self-reported e-cigarette ever use was significantly related to advertisement exposure for Black patients ($p=0.006$) but not for White patients ($p=0.061$) after controlling for demographic and smoking behaviour variables. An increase of self-reported exposure to 10 e-cigarette advertisements resulted in a 6% increase in the likelihood of having ever used an e-cigarette.

Other adult populations' recall of advertising and promotional channels for e-cigarettes

Two further online surveys assessed e-cigarette ad recall among adult populations. Both were conducted in the USA. The first study used a target population of adults who had heard of e-cigarettes, while the second study did not target any specific traits or behaviours.

In 2013, from October to December, Tan et al. surveyed n=1449 adults who had heard of e-cigarettes in an online panel survey in the USA in relation to any associations between self-reported exposure to e-cigarette advertising and perceived harms of second-hand vapour from other people's e-cigarettes (Tan et al. 2015a, b). The survey measured the frequency of respondents' exposure to adverts promoting e-cigarettes from three sources in the previous 30 days and how positive, neutral or negative the respondents perceived the advert information to be. Mean frequency of exposure to advertising (in convenience stores, liquor stores or gas stations; television, radio, or newspapers and magazines; or social media such as Facebook, Twitter or YouTube) was 1.6 (SD±0.6) on a 4-point scale ranging from never (1) to five times or more (4) in the past 30 days.

Significant correlates of higher frequency of exposure to e-cigarette advertising included being a current smoker versus being a non-smoker and having observed others vaping. The majority of respondents perceived the information in the e-cigarettes advertising to be positive (47.5%), fewer perceived it as a mixture of positive and negative (22.2%), and 3.2% as negative. 72.9% (n=1056) reported exposure to at least one form of e-cigarette advertising from the three sources in the past 30 days. Multiple regression analysis found that frequency of e-cigarette advertising exposure was not associated with lower perceived harmfulness of second-hand vapour from others' e-cigarettes to one's health nor associated with lower perceived comparative harm of second-hand vapour versus second-hand cigarette smoke. Perceived negative valence of e-cigarette advertising exposure versus no exposure was associated with higher perceived harm across all three outcomes: harmfulness of second-hand vapour to one's health, concern about the health impact of breathing second-hand vapour and the comparative harm of second-hand vapour versus second-hand cigarette smoke.

In the second survey with n=17,522 adults, those who had heard about e-cigarettes were asked their source of awareness (Pepper et al. 2014a). (Prior to questionnaire items about e-cigarettes, the online survey had displayed images of e-cigarettes and listed typical brands.) Eighty-six percent of respondents had heard of e-cigarettes prior to the survey (94.9% of current smokers, 90.1% of former smokers and 80.6% of never smokers). From a list of provided sources of awareness, most answered another person (34% of never smokers, 39% of former smokers, 48% of current smokers), followed by seeing them for sale in stores including gas stations (22% of never smokers, 27% of former smokers, 47% of current smokers). The next most common response was an advert on TV (31% of never smokers, 35% of former smokers, 40% of current smokers) followed by online (12% of never smokers, 12% of former smokers, 28% of current smokers). (Those that responded 'online' were also asked where online, with the options of Twitter, an ad or user on Facebook, an ad or user on YouTube, an ad on some other Web site, a Web site that sells e-cigarettes, and an online news source, however the data were not reported.) Around 12-16% were aware of e-cigarettes due to an ad in a newspaper or magazine.

3.2.4.2 Overall exposure to TV advertising

A study from the USA examined time series data (Nielsen Monitor-Plus) for commercial advertising reach over the time period of January 2011 to September 2013 to assess the extent to which young adults aged 18 to 24 years had been exposed to e-cigarette television advertisements (Duke et al. 2014). Exposure to television e-cigarette advertisements increased for 18-24 year-olds by 321.0% from January 2011 to September 2013. Regarding television media types, 75.0% of all USA e-cigarette advertising exposure to youth occurred on cable networks; 13.2% was on network television; 11.3% was spot television advertising; and 0.5% was on syndicated television within the studied time period. The majority of exposure of advertisements was by one e-cigarette brand (*blu*), which accounted for 80.4% of all nationally aired TRPs directed at 18-24 year-olds in the first three-quarters of 2013. The next leading brands (*Starfire* and *FIN*) accounted for 7.8% and 6.7% respectively of exposure to this age-group and *NJOY* and 'other' brands accounted for 3.0% and 2.1% of exposure. A graph representation in the article also showed the quarterly trends of exposure to e-cigarette advertising for 35-54 year-olds and ≥55 year-olds (Duke et al. 2014, p.4). Exposure to e-cigarette television advertisements was consistently higher for the two older age groups. Exposure to those aged 55 years and over was almost double the exposure for 18-34 year-olds in the earlier and latter quarters of the time period.

3.2.4.3 Recall of other promotional channels for e-cigarettes

Three cross-sectional observational studies explored recall of other promotional channels for e-cigarettes with adult samples. All were online panel surveys in the USA. One was conducted with current smokers (Wackowski et al. 2015); two with adults who had tried e-cigarettes (Piñeiro et al. 2016, Pepper et al. 2014d).

Current smokers (smoke some days or every day) were asked in April 2014 whether they had ever heard of e-cigarettes prior to participating in the survey, and if they had ever heard about or seen them from a list of sources (Wackowski et al. 2015). Data were collected from 519 respondents, amongst whom 94% had heard of e-cigarettes. The reported sources of awareness were seeing e-cigarettes in a store (86.4%), seeing someone using them in person (83.0%), hearing about them from a friend, family member or co-worker (73.0%), seeing adverts in print or online (71.5%), seeing or hearing about them from adverts on television or radio (68.0%), or from the news (60.9%) or they saw e-cigarettes at an event (17.7%). With regards to common marketing channels (advertising, visibility

at events and available for sale in stores), some significant interactions by demographic, cigarette smoking and e-cigarette use characteristics were identified. Seeing or hearing of e-cigarettes in a store or at an event, was more common among the younger (18-44 years) than older (≤45 years) age groups. Smokers who reported that they had made a quit attempt in the past year were more likely than those who had not to have seen e-cigarettes in a store (92.8% versus 82.4% respectively, $p<0.01$); and those who intended to quit smoking within the next 6 months were more likely than those who did not to have seen or heard of e-cigarettes at an event (24.2% versus 11.1%, $p<0.01$), via television or radio adverts (74.1% versus 61.6%, $p<0.05$) or in a store (90.9% versus 83.5%, $p<0.05$). A majority of respondents (59.9%) believed that using e-cigarettes was less harmful compared to smoking regular cigarettes. When asked why they had responded this way, among other tangible sources of information, 44.2% [36.9–51.5] indicated this idea had come from e-cigarette adverts.

Piñeiro et al. (2016) is the only study with an adult sample in this review to report marketing outcomes by gender. Data were collected between August and November 2013 from n=1815 adults with a history of daily smoking, who had smoked tobacco cigarettes for at least one year and who had used e-cigarettes in the previous month. 66.8% (n=1212) of respondents were male and 33.2% (n=603) were female. When this group of e-cigarette users were asked where they got their information about e-cigarettes from, women e-cigarette users were more likely than men to report getting information about e-cigarettes from friends or family (36.7% vs. 27.2% respectively; $\chi^2=16.91$ $p<0.001$), television or media adverts (5.1% vs. 2.2%, $\chi^2=11.05$ $p=0.001$), and gas stations or cigarette stores (4.8% vs. 1.7%, $\chi^2=15.30$ $p=0.001$), whereas men were more likely to report getting information about e-cigarettes online than women (93.0% vs. 85.1%, respectively; $\chi^2=28.93$ $p=0.001$). For the whole sample, advertising (3.2%) and stores (2.7%) were the least reported source of information about e-cigarettes. In terms of e-cigarettes availability from commercial sources, when this group of e-cigarette users were asked where they bought their e-cigarette supplies, women e-cigarettes users were more likely than men to report purchasing them from gas stations or cigarettes stores (9.1% vs. 4.1%, respectively; $\chi^2=18.44$ $p=0.001$) and men using e-cigarettes more likely than women to report buying them online (88.6% vs. 75.8%, respectively; $\chi^2=18.44$ $p=0.001$).

The third survey collected data in March 2013 from n=3878 adults who had ever used an e-cigarette (even one puff) (Pepper et al. 2014d). Prior to questionnaire items about e-cigarettes, the online survey had displayed images of e-cigarettes and listed typical brands. The survey requested respondents' reasons for trying e-cigarettes, asking them to tick all the answers that applied from a list including appealing advertising. The most common reasons given were: I was curious about e-cigarettes (53%), a friend or family member used, gave, or offered an e-cigarette (34%), e-cigarettes can help me quit or cut back on smoking regular cigarettes (30%). The reason selected the least often was the advertising for e-cigarettes appeals to me (6%); one third (34%) of those who selected this reason had discontinued e-cigarette use. From the open-ended responses, 21 participants (0.4%) noted that they started using e-cigarettes because of price promotions or free samples.

3.2.4.4 Receptivity to e-cigarettes advertising and promotions

One online survey with n=307 18-40 year old undergraduate college students in Hawaii examined young adults' receptivity to e-cigarettes advertising and promotions (Pokhrel et al. 2015).

Receptivity to advertising was assessed by measuring respondents 'liking' for e-cigarettes adverts they had seen, using 5 scaled items relating to appeal. Among the whole sample, the most popular responses were negative. 23.8% liked e-cigarette ads or commercials relative to other ads or commercials, however, 41.2% reported that they liked e-cigarettes ads/commercials the least. 21.5% found e-cigarette ads or commercials funny, while 45.9% reported that they never found them funny.

10% found e-cigarette ads or commercials sexy, while 65.9% reported that they never found them sexy. 78.0% of respondents never wished they were like the people in the e-cigarette ads/commercials and 87.7% responded that they tended not to pay attention to e-cigarette ads/commercials. Those who self-reported having ever used an e-cigarette (lifetime use) were more likely to like e-cigarette advertising than those who never used in e-cigarette (mean score 8.7 SD±2.6 vs 7.4 SD±2.8 p<0.001).

Receptivity to e-cigarette promotions was assessed by asking the respondents whether they would wear or use an item that has the name of an e-cigarette product on it and if they could recall ever buying or receiving for free any product which promoted an e-cigarette brand or was distributed by an e-cigarette company. Summed scores provided a measure of receptivity to e-cigarette promotions. Lifetime e-cigarette users (ever used an e-cigarette) were more receptive to e-cigarette promotions than lifetime e-cigarette non-users (mean score 3.4 SD±0.7 vs. 3.2 SD±0.4, p<0.001). The researchers used structural equation modelling to test whether exposure and receptivity to e-cigarette marketing would be associated with perceptions that e-cigarettes are less harmful than cigarettes. Marketing receptivity was found to have a significant effect on low e-cigarette harm perceptions (ie. respondents' scale of agreement with 14 statements on whether e-cigarettes reduce harm, improve health and reduce addiction), such that higher marketing receptivity was associated with perceptions that e-cigarettes are less harmful (p<0.001). However, it is worth noting that harm perceptions were assessed through general statements (ie. 'E-cigarettes improve breathing and reduce coughing') rather than direct comparisons with perceptions of harm from combustible tobacco.

3.2.4.5 Recall of e-cigarette brands

Two studies examined recall of e-cigarette brands; both were cross-sectional surveys which included younger adults in their samples from age ≥15/≥16 years. The first study was an on-line panel survey from Canada (Shiplo et al. 2015). The second was an in-home face-to-face survey from New Zealand (Li et al. 2015b).

Shiplo and colleagues' online survey in October 2013 asked respondents who had ever tried or currently use e-cigarettes (used in the last 30 days) in Canada to recall the e-cigarette brands they had used (Shiplo et al. 2015). Results were reported for sub-samples of 16-24 year old non-smokers (n=311) and smokers, (n=323), and ≥25 year old smokers (n=461). Among all ages of ever e-cigarette users, the most common brands reported were VaPUR, Blu and other. Among those reporting to be current e-cigarette users, 47.4% (n=27) of 16-24 and 52.2% (n=24) of ≥25 year-old smokers reported having a usual e-cigarette brand, with similar brand frequencies as ever e-cigarette users. None of the 16-24 year old non-smokers (smoked <100 cigarettes in their lifetime and none in the previous 30 days) reported having a usual e-cigarette brand. 3.2% (n=10) of 16-24 year-old non-smokers and 13.6% (n=44) of 16-24 year-old smokers did not know the brand of e-cigarettes they used. 7.2% (n=33) of ≥25 year-old smokers did not know the brand of e-cigarettes they used.

In 2014, Li and colleagues interviewed a sample of n=2594 adults (≥15 years) residing in permanent, private dwellings in New Zealand about which e-cigarette brands they had ever or currently used (Li et al. 2015b). Multiple responses were allowed, chosen from a list of 15 brands, plus 'other' and 'don't know'. Among all ever-users (ever tried an electronic cigarette, n=355), over half (57.8%) could not name the e-cigarette brand(s) that they had ever tried; 17.8% of current users of e-cigarettes (using an e-cigarette 'at least once a day', 'at least once a week', or 'at least once a month', n=31) could not name their current brand.

3.2.4.6 Experimental Studies with Adults

Seven studies, all conducted in the USA, used an experimental design. Three examined e-cigarette marketing with younger adult samples ranging from 18-36 years (Trumbo & Kim 2015, Villanti et al. 2015, King et al. 2016), three with current smokers (≥18 years) (Kim et al. 2015b, Maloney & Cappella 2015, Pepper et al. 2014b), and one with a general adult population sample without specific traits or behaviours (Smith et al. 2015). Six of the studies were administered via an online survey and one in a laboratory setting. Additionally, one was a randomised control trial, the only one identified for this review (Villanti et al. 2015). A brief description of each study is outlined below, organised by the target population.

Experimental studies with young adults

Trumbo and Kim (2015) exposed n=296 undergraduates from a public university to 3 e-cigarettes video adverts (brands *blu, NJOY* and *Mistic*) in an online survey in 2013. Participants rated each brand and advert on appeal (how enjoyable, likeable and appealing they were). The ad for *blu* was significantly more appealing to the undergraduate group than the adverts for *NJOY* and *Mistic* ($p<0.01$). In a regression analysis, appeal of e-cigarette advertising videos was independently positively associated with intention to use an e-cigarette in the near future ($p=0.001$). Furthermore, the appeal of e-cigarette advertising videos was not controlled by the addition of tobacco or e-cigarette ever use variables in the analysis, remaining positively associated with intention to use an e-cigarette ($p=0.004$).

In a randomised control trial, measures of curiosity about e-cigarettes, likelihood of e-cigarette use and e-cigarette trial among never-users were collected at two time points (January and June 2013) via an online panel survey (Villanti et al. 2015). One group of 18-34 year olds was exposed to four images of e-cigarette advertising (brands *blu, Fin, NJOY, White Cloud*) (n=1583); the control group was not exposed (n=1613). At the first wave, e-cigarette never users in the exposed group were significantly more likely to report curiosity to try an e-cigarette, or that they would try an e-cigarette if offered by a friend, compared to those in the unexposed group. The percentage of young adults who had never used an e-cigarette, but reported that they would try an e-cigarette soon did not vary significantly. At the 6-month follow-up, the proportion of e-cigarette never users in the exposed group who reported having tried an e-cigarette since, did not vary significantly from those in the control group. However, ad exposure was significantly associated with e-cigarette trial at 6-month follow-up among never users of both e-cigarettes and cigarettes at baseline (3.6% exposure group vs. 1.2% control group; AOR=2.85; 95% CI=1.07, 7.61). There was no association between ad exposure and self-reported ever or current cigarette use among young adults who had never used e-cigarettes.

In a laboratory experiment in 2014, set up to resemble a living room, participants viewed e-cigarette video adverts on a computer screen (King et al. 2016). In order to explore ad imagery, overt branding and product names were omitted to reduce potential bias to specific brands. The sample comprised 18-36 year old self-reporting smokers (5-20 cigarettes per day) who were not currently attempting to quit. One group (n=38) viewed the e-cigarette videos; the control group (n=40) viewed adverts for bottled water. E-cigarettes ad exposure increased ratings of desire to use an e-cigarette ($p<0.001$) and bottled water ad exposure increased ratings of desire to drink water ($p=0.029$). Exposure to the e-cigarettes adverts, relative to the water adverts, increased the reported urge for a regular cigarette ($p<0.001$), as well as increased ratings of desire to smoke a cigarette of the participants' preferred brand ($p<0.023$).

Experimental studies with adult smokers (≥18 years)

In January 2013, n=519 current tobacco smokers' receptivity to a *blu e-Cigs* television advert and their thoughts about smoking and quitting, their urge to smoke and likeliness to try e-cigarettes after viewing the advert, was examined in an online panel survey (Kim et al. 2015b). The authors compared findings between those who had prior experience of using e-cigarettes and those who had never used them. Those who had tried e-cigarettes were significantly more receptive to the *blu e-Cig* advert than non-users ($p<0.05$); although non-users were fairly receptive to the advert. Viewing the e-cigarette advert prompted thoughts about smoking cigarettes (a little, somewhat, very or a lot) in 75.8% of the sample, a mean=42.1 (SD±1.9) urge to smoke (on a scale of 0 'no urge' to 100 'strongest urge I have ever experienced') and prompted thoughts about quitting smoking (a little, somewhat, very or a lot) among 74.6% the sample, with no significant differences between e-cigarettes users and non-users. Amongst the smokers who were not currently using e-cigarettes, 66.0% reported that they were somewhat or very likely to try e-cigarettes after viewing the *blu e-Cig* advert.

Later that year, a between-subjects study design explored whether exposure to e-cigarette adverts with visual vaping cues increased urges to smoke tobacco cigarettes compared to exposure to e-cigarette adverts without visual vaping cues, and no exposure to adverts (Maloney & Cappella 2015). The n=884 sample, comprising daily, intermittent and former smokers, were exposed to one of three conditions via an online panel survey: the cue condition group viewed e-cigarette adverts with visual depictions of vaping cues; the no-cue condition group viewed the same ads but with only words rather than visual vaping cues displayed; and a no-ad control group. For daily smokers, the main effect of the e-cigarette adverts cue condition on urge to smoke a tobacco cigarette was significant ($p<0.001$); their post-test urge to smoke a tobacco cigarette was also significantly higher than daily smokers in the no-cue ($p<0.001$) and in the no-ad conditions ($p=0.001$). There were no significant main effects on urge to smoke among intermittent smokers or former smokers between exposure conditions. The experiment also assessed whether exposure to vaping cues decrease smokers' and former smokers' (a) self-efficacy to quit/continue abstaining from smoking tobacco cigarettes, (b) attitudes toward quitting smoking/smoking abstinence, and (c) behavioural intentions to quit/continue abstaining from smoking. Among daily and intermittent smokers, there were no significant main effects across the three conditions for the three measures. Among former smokers, there were no significant main effects across the three conditions for post-test self-efficacy to continue abstaining from smoking tobacco cigarettes or for attitudes toward abstaining from smoking tobacco cigarettes.

Another study focused on the impact of ad message themes and visual cues on smokers' interest in trying e-cigarettes (Pepper et al. 2014b). In a between-subjects factorial design, n=3,253 adult current smokers who had never tried an e-cigarette were randomly assigned to view one of nine stills for a mock e-cigarette brand. The stills varied by image (a person using an e-cigarette, a rechargeable kit, no cigarette) and headline message comparing e-cigarettes with regular cigarettes (highlighting a difference, a similarity, or neither, between the products). Respondents were asked "How much does seeing this ad make you want to try e-cigarettes?" There was higher interest for trying e-cigarettes after viewing adverts with messages about the differences between e-cigarettes and regular cigarettes and images that showed a person using an e-cigarette. Adverts with the headline "Better than a cigarette" and an image showing a person using an e-cigarette created significantly more interest in trying e-cigarettes than the control ($p<0.05$). Greater interest was triggered in trying e-cigarettes when ad message stated that e-cigarettes were healthier than cigarettes, less expensive than cigarettes, or helpful to quit smoking ($p<0.05$) compared with the control message.

Experimental study with adults from the general population

Using a general adult population sample, Smith et al. (2015) compared images of magazine adverts for the e-cigarette brand *blu with* a matching set of adverts for the snus brand *Camel*, with n=600 participants screened from an online panel survey. Amongst respondents exposed to e-cigarette adverts, advert receptivity, interest in trying e-cigarettes and favourable product attitudes, were significantly higher for current smokers than non-smokers ($p<0.001$). In the snus condition, equivalent (although weaker) relationships existed. When asked which product they would choose for a free sample from a choice of e-cigarette, tin of smokeless tobacco, pack of cigarettes or 'please do not send me any of these', those in the e-cigarette condition were significantly more likely to choose an e-cigarette (39%) compared to those exposed to the snus condition ($p=0.014$). Within both conditions, current smokers were significantly more likely to choose an e-cigarette than non-smokers ($p<0.001$).

3.2.4.7 Summary

This section outlined findings from 22 studies that examined how adults respond to e-cigarette marketing. None of the adult studies were conducted in the UK, with the vast majority from the USA. Fifteen studies were observational designs, including one longitudinal study; seven studies were experimental designs.

As with the child observational studies (Section 3.2.3), the greatest proportion of studies measured a*dvertising channel recall*; five from the USA and one each from the Netherlands, Canada and New Zealand. Most of the studies also assessed frequency of exposure in addition to advertising awareness. The studies targeted different adult populations, including young adults, former and current smokers and ever e-cigarette users, and show that all populations were aware of e-cigarette advertising from a wide variety of sources. In studies from the USA, advertising exposure was found to be associated with ever e-cigarette use and also current smoking. There were some mixed results on how advertising exposure related to consumer knowledge. One study found that participants reporting a higher level of exposure were less likely to answer 'don't know' to items testing knowledge on e-cigarette constituents and regulation, yet more likely to report incorrectly to statements on nicotine. Another study found that frequency of exposure was not associated with lower perceived harmfulness of second-hand vapour or lower perceived comparative harm of second-hand vapour versus second-hand cigarette smoke. Exploring advertising exposure among current and former smokers in New Zealand, one study found that exposure did not differ by smoking, recent quit attempts, or ever use of e-cigarettes. In the same study, exposure was not associated with susceptibility to use e-cigarettes for never users. One longitudinal study from the Netherlands found no association between current smokers noticing e-cigarette adverts and starting ever use of e-cigarettes at one year follow up. However, noticing adverts was associated with greater disapproval of smoking and quit attempts, although not quit success.

Two studies suggest that adult *exposure to e-cigarettes advertising* increased in the review period. A time series analysis from the USA found that between 2011 and 2013, young adults' (18-24 year olds) exposure to TV e-cigarette advertising increased by over 300%, with the vast majority of exposure by one e-cigarette brand. Further, exposure for older age groups was consistently higher than that for younger adults, with almost double the level of exposure for those aged 55 years and over. Although not strictly measuring exposure, the longitudinal study conducted in the Netherlands found a significant increase in current smokers noticing e-cigarette adverts between 2013 and 2014.

Three studies, all from the USA, examined *recall of other promotional channels*. In general, however, these are small inclusions of other promotional avenues, rather than the focus of the study. In one study a tiny proportion of the sample reported that they started using e-cigarettes because of free

samples or price promotions. Another study highlighted that men and women obtain e-cigarette information from different promotional sources, although compared to other sources of information such as family and friends, promotional sources were the least reported sources. Regarding recall of other promotional channels, one study reported some positive findings regarding quitting, with those having made a recent quit attempt more likely to recall having seen e-cigarettes in stores, and those intending to quit in the next six months more likely to recall having seen e-cigarettes at events, than those who had not.

Few studies examined *receptivity to advertising and promotions* and *brand recall.* In the USA, young adults' receptivity to e-cigarette advertising was examined in one study by exploring ad appeal. Overall, responses to e-cigarette adverts were negative compared to other adverts. However, those that had ever used an e-cigarette were more likely than those who had not, to like e-cigarette advertising. Similarly, ever users were more likely than never users to be receptive to e-cigarette promotions. Only two studies explored e-cigarette brand recall. In a New Zealand study only around half of e-cigarettes users could report having a usual brand. In Canada, more than half of ever users could not name a brand that they had tried.

Seven *experimental studies,* all conducted in the USA were identified. Overall, these studies show the impact of e-cigarette advertising, such as ad exposure and receptivity, on variables such as intention and desire to use an e-cigarette and urge to smoke a tobacco cigarette. In several studies e-cigarette advertising was associated with intention or desire to use an e-cigarette among populations of young adults. In one study with young adult smokers, e-cigarette advert exposure was associated with increased desire to smoke a tobacco cigarette. Highlighting the impact of advertising images on current and former adult smokers, in one study visual vaping cues were found to increase the urge to smoke a tobacco cigarette among daily smokers, but not intermittent or former smokers. In another study advertising message was found to be important in generating interest in trying e-cigarettes among smokers who had never tried an e-cigarette. Only one randomised control trial was identified for the review. This showed that among never e-cigarette users, ad exposure was associated with curiosity to try an e-cigarette, and at six month follow-up, ad exposure was associated with e-cigarette trial (but not ever cigarette use) among never users of both e-cigarettes and cigarettes at baseline. However it should be noted that at six month follow-up, never smokers in the ad exposure group reporting to have tried an e-cigarette did not differ from the control group.

3.2.5 Studies with Healthcare Professionals

One observational study that measured source of awareness of e-cigarettes (including from commercial advertising) was conducted with paediatric healthcare professionals rather than a population of potential users (Pepper et al. 2014c). In April 2013, Pepper and colleagues surveyed online n=615 physicians and nurse practitioners who provide preventive care to preteens and adolescents ages 11–17 years in Minnesota, USA. (Prior to questionnaire items about e-cigarettes, the online survey had displayed images of e-cigarettes and listed typical brands.) Among healthcare providers who provide preventive care to teenagers, who were aware of e-cigarettes (n=516), the most frequently reported sources of information from a given list of nine potential sources were: patients (62%), news stories (39%), and advertisements (37%). More than 20% had seen them for sale. A substantial minority of respondents reported having heard of e-cigarettes through professional sources (including journal articles and newsletters) (24%) and colleagues (11%).

3.3 Regulatory framework for e-cigarette marketing

This section of the report outlines findings from interviews and documentary review intended to capture the current and future regulatory framework for e-cigarette marketing in the United Kingdom. It begins with a background section that describes developments up to 2014, followed by findings related to:

- Early e-cigarette marketing
- CAP/BCAP and MHRA roles
- CAP consultation and code
- Views on previous code
- Tobacco Products Directive
- E-cigarette marketing post TPD
- Additional national regulations
- Summary

3.3.1 Early E-Cigarette Marketing

E-cigarettes first began to appear on the UK market in 2007 accompanied by minimal levels of promotion. Marketing was typically characterised by a modest amount of local press advertising and the companies involved tended to be small, independent e-cigarette importers or manufactures. By 2010 the market was beginning to grow rapidly, illustrated by an increase in the number of people using e-cigarettes and also e-cigarette companies, who were beginning to promote products more widely, and with more concerted advertising campaigns. A noticeable increase in e-cigarette advertisements in non-broadcast media, particularly newspapers, depicting cigarette-like products began to raise concerns from members of the public and the tobacco control community. Broadcast ads, although permitted, could not show e-cigarette products, however, questions were still raised in some quarters about the potential appeal of some of their content to children.

At that time there were no e-cigarette specific rules for advertising in non-broadcast or broadcast media. Instead, the rules governing the advertising of e-cigarettes were a complex mix of general consumer product and tobacco advertising rules. For tobacco, all forms of advertising were (and still are) banned under the Tobacco Advertising Directive. For non-broadcast media, e-cigarettes were subject to existing, general rules under the Committee for Advertising Practice (CAP) and Broadcast Committee for Advertising Practice (BCAP) codes which protects from misleading, harmful, offensive or otherwise socially irresponsible advertising. Rules concerning e-cigarette advertising in broadcast media were captured by existing, broadly written prohibitions in the tobacco section of the CAP/BCAP code which is based on the Tobacco Advertising Directive. Intended to prevent the indirect promotion of tobacco products, this limits advertising for products with similar characteristics to tobacco. As the advertising emerging at that time was largely for first generation ‘cig-a-like’ e-cigarette products, this resulted in a de facto ban on TV e-cigarette advertising showing e-cigarette products.

Using existing CAP/BCAP frameworks for e-cigarette advertising therefore presented regulatory challenges. As promotion grew, it became apparent that attempts to fit existing rules around these new products were not ideal. Complaints from members of the public, alongside enquires from e-cigarette marketers looking for product-specific guidance, meant that the lack of specific rules concerning the advertising of e-cigarettes had become a policy issue for CAP/BCAP by 2013. It was decided that new e-cigarette rules were required to protect consumers and provide clarity to the e-cigarette industry about what they could and could not do with regards to advertising. A CAP/BCAP consultation in 2014 informed new rules for e-cigarette advertising which provided a variety of specific

protections, particularly for children and non-smokers. Crucially these new rules allowed e-cigarettes to be shown in use on TV provided that that it was clear that they were not tobacco products. The new rules were intended to be interim measures while the requirements of the revised EU Tobacco Products Directive were being finalised.

3.3.2 CAP/BCAP and MHRA Roles

CAP and BCAP have responsibility for writing the advertising rules for non-broadcast and broadcast media respectively. They share a policy and advice team, and a compliance team. However, enforcement of the rules across the UK rests with the Advertising Standards Authority (ASA). The ASA is a separate organisation with authority to take forward and enforce the rules of the CAP and BCAP codes independently from CAP/BCAP. E-cigarettes that are sold as consumer products (currently all of the UK market) are subject to CAP/BCAP rules.

The Medicines and Healthcare products Regulatory Agency (MHRA) is the statutory authority for the regulations around advertising medicines which has a well-established regulatory framework. E-cigarettes which have been granted a medicinal license are subject to the MHRA advertising rules, in addition to the CAP/BCAP rules. The MHRA has no involvement in the advertising of unlicensed, consumer e-cigarette products.

Advertising regulations for medicines have a number of quality standards. Manufacturers are required to comply with standards for describing product characteristics which includes prescribing information. They must also present the product objectively in any advertising, provide information on actual use and not seek to mislead consumers or advertise to children. Celebrity or health professional endorsement is also not permitted. Medicines advertising does not permit direct comparisons of named products, although product characteristics can be referenced.

The MHRA has powers to investigate complaints about the advertising of licensed medicines. In most cases this involves engagement with the company in question, a response from the company and an agreement being reached which can involve the manufacturer issuing a correction. The outcome is then published on the MHRA website. In exceptional cases further action can be taken as breaching medicines advertising rules can be a criminal offense. The ASA can also investigate complaints about the advertising of licensed medicines as both the CAP and BCAP code reflect the advertising requirements of the Human Medicines Regulations.

As we outlined in Section 1 of this report, only one e-cigarette has gained a medicinal license in the UK (or indeed any other country). This product is called e-Voke and is manufactured by a subsidiary of British American Tobacco. However, e-Voke is not yet available on the UK market so cannot be prescribed or sold over the counter. If and when it becomes available, marketing of the product will be subject to MHRA rules on the advertising of medicines, and CAP/BCAP rules on the advertising of e-cigarettes, as would any other future e-cigarette or nicotine vapouriser that gained a medicines license.

3.3.3 CAP/BCAP Consultation and Code

As we outline above, up until 2014 practice and standards for e-cigarette advertising were guided by general consumer product and tobacco advertising rules. In this section of the report we describe how this changed following a consultation carried out by CAP/BCAP which established a new framework (or code) that applied until May 2016 when it was superseded by new regulations based on the EU Tobacco Products Directive.

CAP/BCAP launched a UK wide consultation on new advertising rules for e-cigarettes in February 2014. The proposals that were consulted on included (CAP 2014):

- specific rules designed to offer particular protection to the young, the vulnerable and to non- and former-users of nicotine. This includes rules prohibiting e-cigarette ads from appealing to under 18s or showing anyone under 25 using an e-cigarette
- rules that specifically address concerns about the indirect promotion of tobacco products via advertising of e-cigarettes
- proposals to prohibit health or medicinal claims for e-cigarettes unless the product is licensed for those purposes
- a requirement for advertisers to make clear that the product being advertised is an e-cigarette and whether or not it contains nicotine

Stakeholders responded to the consultation and in all 110 responses were received. These varied in their content with a small number of responses calling for all forms of advertising to be removed. However, most feedback recognised the need for some forms of promotion but that this needed to be responsible. Responses to the consultation are still available on the CAP website. The suggestions outlined in the consultation were upheld and some additions made, specifically regarding cross-promotion, the need to have no individuals under the age of 25 appearing in advertisements and regulations around scheduling to avoid children's programmes.

Following the consultation, Section 22 of the CAP Code and Section 33 of the BCAP Code were developed to cover electronic cigarette advertising (CAP, 2015). The rules were based on seven principles:

- Ensure your ads are socially responsible
- Don't target or feature children, or include content which is likely to appeal particularly to children
- Don't confuse e-cigarettes with tobacco products
- Don't make health or safety claims
- Don't make smoking cessation claims
- Ensure you don't mislead about product ingredients
- Don't mislead about where products may be used

The new rules applied from November 10th 2014. CAP and BCAP committed to conducting an internal review of how these rules had been interpreted and applied and this was carried out one year later towards the end of 2015. A report from this review is not currently publicly available.

Complaints were submitted to the ASA regarding particular e-cigarette ads both prior to and following the introduction of the 2014 code. According to CAP, these were not significant in number. The ASA receives around 35,000 complaints a year about all advertising, and relatively few (around 700-800, with around half of these focusing on one particular advert) were received about e-cigarette adverts in the 12 months following the introduction of the new rules. The ASA has an approach to

enforcement following complaints which is the responsibility of their investigation teams. In most cases companies who breach the code are unaware of it or poorly informed, and information exchange and advice can resolve the situation. However, the ASA has formally investigated at least 14 cases of e-cigarette advertising in the UK and rulings on each of these have been published on the ASA website.

3.3.4 Views on Previous Code

Participants from the tobacco control community said that they welcomed some product specific advertising restrictions on e-cigarettes that were introduced by CAP and BCAP. However, there were mixed views on the 2014 code. Some said that they thought it appropriate to have rules which were not as strict as those for tobacco as they did not want smokers to receive a message that vaping was similar to smoking. Others said that the CAP/BCAP rules did not go far enough to control advertising. One participant expressed concern over billboards and poster advertising: they said that the introduction of the rules had resulted in little change to the style of advertising, with imagery glamorising vaping.

Participants had fewer concerns over TV advertising under the code. While all participants said that the potential impact of TV advertising to young people and non-smokers was an issue, it was felt that TV advertising under the rules had achieved the right balance between not promoting e-cigarettes to young people/non-smokers and making adult smokers aware of e-cigarettes as an alternative to smoking. One participant noted that under the framework, advertising tended to have a stylish adult-oriented theme, rather than the youth-oriented advertising the same companies were perceived to be airing in the USA or elsewhere.

There were mixed views over the enforcement of the rules. Several participants highlighted that some provocative TV advertisements had been banned when the rules were first imposed. This indicated adequate enforcement. However, there was also some understanding amongst participants that the fact that an advert was released which then generated complaints could result in an indirect form of publicity for the product given the controversy complaints could generate. This could inadvertently draw attention to the particular brand in question or the issue of e-cigarette advertising in general. However, there was consensus amongst participants that the ASA appeared to have acted swiftly to deal with complaints and that television adverts that were perceived as inappropriate had largely been removed following ASA intervention under the previous code.

The prevailing viewpoint for the CAP/BCAP framework was that e-cigarette advertising required consistent monitoring to ensure messages focused on e-cigarettes as an alternative product for smokers, rather than something that was attractive for recreational use among non-smokers. There was some scepticism over whether e-cigarette marketers had simply been treading carefully until the new TPD regulations were in force and there was doubt over underlying motives behind e-cigarette marketing, particularly where tobacco companies were involved.

3.3.5 Tobacco Products Directive

On May 20th 2016 new rules concerning e-cigarette advertising, set out in Article 20(5) of the Tobacco Products Directive (2014/14/EU), became applicable to EU member states. Although less restrictive than the rules for tobacco advertising, the TPD prohibits the advertising of nicotine-containing, unlicensed e-cigarettes in media with cross-border impact, including TV, radio, online (athough with scope for retailers to retain websites making limited claims), newspapers, magazines and cross-border sponsorship. Specifically the TPD states:

Member States shall ensure that:

> (a) commercial communications in information society services, in the press and other printed publications, with the aim or direct or indirect effect of promoting electronic cigarettes and refill containers are prohibited, except for publications that are intended exclusively for professionals in the trade of electronic cigarettes or refill containers and for publications which are printed and published in third countries, where those publications are not principally intended for the Union market
>
> (b) commercial communications on the radio, with the aim or direct or indirect effect of promoting electronic cigarettes and refill containers, are prohibited
>
> (c) any form of public or private contribution to radio programmes with the aim or direct or indirect effect of promoting electronic cigarettes and refill containers is prohibited
>
> (d) any form of public or private contribution to any event, activity or individual person with the aim or direct or indirect effect of promoting electronic cigarettes and refill containers and involving or taking place in several Member States or otherwise having cross-border effects is prohibited
>
> (e) audiovisual commercial communications to which Directive 2010/13/EU of the European Parliament and of the Council applies, are prohibited for electronic cigarettes and refill containers

In the UK, responsibility for interpreting the TPD requirements, and the advertising of non-licensed e-cigarette products, rests with the Department of Health (DH). How the TPD is applied at a UK-wide level has been set out in The Tobacco and Related Products Regulations (TRPRs) 2016, which came into force on May 20th 2016. In its application of the TPD and the framework for enforcing the new advertising regulations, the DH has aimed to strike a balance between the perceived benefits of current smokers receiving information about e-cigarettes to encourage them to switch, and the need to protect never smokers, particularly children, from viewing the products as appealing. Associated guidance on the advertising provisions of the TRPRs has been developed by DH. Table 4 below illustrates the DH's interpretation of the requirements.

Table 4: Summary of requirements

Media type	Legislative position	Implementing measure
Broadcast TV advertising and sponsorship	Prohibited	Implemented through the BCAP Code and Broadcast Code
Broadcast TV product placement	Prohibited	Communications Act 2003 as amended by the Tobacco and Related Products Regulations 2016
Radio advertising and sponsorship	Prohibited	Implemented through BCAP Code and the Broadcast Code
On-demand television advertising, sponsorship and product placement	Prohibited	Communications Act 2003 as amended by the Tobacco and Related Products Regulations 2016
Newspapers, magazines and periodicals – except trade publications and third country publications	Prohibited	Tobacco and Related Products Regulations 2016
Internet display advertising, email and text message advertising - except trade publications and third country publications	Prohibited	Tobacco and Related Products Regulations 2016
Sponsorship of activity/individuals involving or taking place in several Member States or otherwise having cross-border effects	Prohibited	Tobacco and Related Product Regulations 2016
Company's own websites, and other non-paid-for online space under their control	No advertising or promotion but factual information about products, factual 'how to' videos permitted	Tobacco and Related Product Regulations 2016
Retailer sites	No advertising or promotion but factual information about products, factual 'how to' videos and sales lists permitted	Tobacco and Related Product Regulations 2016
Blogs/tweets/independently compiled, non paid for reviews	Permitted	
E-cigarette trade press and trade to trade communication	Permitted	
Cinema, fax, outdoor posters, posters on sides of buses (not travelling outside of the UK), leaflets, and direct hard copy mail	Permitted	

Source: Department of Health (2016)

In the first instance it is anticipated that the ASA will deal with infringements of the regulations. However, legal enforcement of the regulations is the responsibility of local Trading Standards teams. The Department of Health has written to Trading Standards across the UK to alert them to the new legislation and requirements around enforcement. In the first year of implementation, it is anticipated that the ASA's approach should be supportive of manufacturers who may not realise they are not following existing regulations, although appropriate action will be taken if required. In particular, repeat offenders and those referred by the ASA are likely to be dealt with by Trading Standards.

As the law surrounding e-cigarette advertising has now changed, one next step is to put the new requirements into further detailed guidance within the CAP/BCAP codes. A CAP consultation titled "**Consultation on the advertising of electronic cigarettes: CAP and BCAP's proposals for changes to**

their Codes and guidance in response to the European Tobacco Products Directive taking effect in the UK" was launched on September 29th 2016 and will be open until October 31st 2016 This will ensure the TRPRs are reflected adequately in the codes. For advertising in permitted media, such as billboards, posters, leaflets and on buses, the existing CAP rules still apply.

3.3.6 E-cigarette Marketing Post-TPD

Interviewees were asked to provide their perspective on potential issues related to e-cigarette marketing following the introduction of the new rules contained within the TPD. Interviewees gave a number of examples of issues that may arise. These included: challenges to the TPD; health claims made by manufacturers; non-nicotine containing products; the difference between promotion and information; and the potential diversion of resources to non-restricted media. These are outlined below.

3.3.6.1 Challenges to the TPD

At the time of the interviews, the UK's referendum on membership of the European Union had not been held. Discussion of challenges to the Tobacco Products Directive thus centred around recent and imminent efforts to challenge the new law. Legal challenges to the TPD had taken place in UK and EU courts, brought forward by the tobacco industry and also one independent e-cigarette manufacturer, Totally Wicked. These had been ongoing for many months, but were overturned, notably by the European Court of Justice on May 4th 2016. In the UK, a subsequent challenge was posed by the tabling of a 'fatal' motion in the House of Lords which could have resulted in a debate and possible legislative changes that would have resulted in the TPD not being implemented. However, this 'fatal' motion brought by Lord Callanan, which focused on Article 20 of the TPD (the e-cigarette provisions) was modified to one of 'regret' due to pressure from opposition parties. The debate in the Lords therefore focused on the potential unintended consequences of Article 20 but did not result in any changes to the legislation.

Although not addressed by interviewees, it is worth noting that the result of the EU Referendum in the UK, which resulted in a majority of the public supporting leaving the European Union, could have future implications for the provisions of the Tobacco Products Directive including those that focus on e-cigarettes. This is unlikely to happen quickly given the timeline for negotiations regarding the UK's departure which will take two years or more. However, this may become an issue beyond that phase and mean that current marketing restrictions are challenged or overturned. This is an issue for future research.

3.3.6.2 Health claims

Current regulations on e-cigarette marketing state that health claims can only be made for medicinally licensed e-cigarette products, with non-licensed products prohibited from health claims. It was noted by some participants that due to growing evidence on the potential benefits of e-cigarettes, including for example, the message contained within a Public Health England report that e-cigarettes are around 95% less harmful to health than smoking (McNeill et al. 2015), marketers may want to make claims that unlicensed products are safer than smoking. A challenging issue may therefore arise surrounding the use of general statements, such as the one within the PHE report, in place of product-specific claims. It was highlighted by those closely involved in the implementation of regulations that some

careful thought would be needed to manage this. CAP and BCAP's current consultation will seek views on the issue of health claims.

3.3.6.3 Non-nicotine containing products

The TPD applies only to advertising for nicotine containing e-cigarettes or refill cartridges. While non-nicotine containing products are not specifically subject to the new rules, the rules also state that advertising is prohibited that *indirectly* promotes nicotine-containing products. Many participants noted uncertainty about what this will mean in practice and whether there is the potential that a non-nicotine product could be advertised under the same brand name as a nicotine-containing product prohibited from advertising. This type of brandsharing could have unintended consequences and at the time of writing, the key agencies involved in TPD implementation were unclear how this may develop. Concern was also raised by some interviewees that non-nicotine containing products could be used by young non-smokers and allowing these products to be advertised may increase their appeal to this group, although this is an issue for future research.

3.3.6.4 Promotion vs information

The TPD prohibits the advertising and promotion of e-cigarettes on companies' own websites and retailer sites, but not the provision of factual information about products. It is determined within the TRPRs that information not sought directly from a consumer is likely to be promotion, but that a consumer who actively seeks out a business's webpage is requesting information. In this context the Department of Health has offered guidance on the interpretation of what may be considered information rather than promotion. However, those involved in implementing the regulations highlighted that this would need monitoring to ensure informational messages were not crossing over to promotion. The current (2016) CAP and BCAP consultation will also pay attention to this issue.

3.3.6.5 Diversion of resources to non-restricted media

While the TPD restricts the types of advertising with arguably the greatest reach, it also allows e-cigarette companies to continue to communicate with consumers about their products, including for example, online information, and through billboards, posters and leaflets. Many participants said that they expected an increasing focus on advertising in non-restricted media, such as billboard and bus advertising. Here comparisons were drawn with tobacco advertising, where billboards became a creative and impactful advertising vehicle in the face of TV advertising bans. Some participants also raised concerns about the likelihood of future investment in more extensive or appealing point-of-sale displays, for which CAP rules do not apply, and whether this could increase appeal to never smokers including young people. Others, however, emphasised the importance of smokers being able to see and obtain information about products at the point of sale in order to help more smokers to move away from tobacco.

3.3.7 Additional National Regulations

Within the UK some variation on e-cigarette regulation is permitted under devolution. In addition to the implementation of the TPD, which is UK-wide, individual countries may choose to implement additional domestic advertising restrictions or further restrictions, for example, with regards to the sale of e-cigarettes or use of e-cigarettes in enclosed spaces. Current proposals for additional regulations in the UK, and also Ireland, are outlined below.

3.3.7.1 Domestic advertising restrictions

The Health (Tobacco, Nicotine, etc. and Care) (Scotland) Act was passed by the Scottish Parliament in March 2016. The Act makes provision for Scotland to prohibit or restrict domestic forms of advertising beyond the scope of the TPD. This includes advertising via billboards, leafleting, brand sharing, free distribution, nominal pricing and domestic advertising events. The Act relates to all consumer nicotine vapour products (NVPs) and related products, such as refills, liquids and chargers, *whether they contain nicotine or not*. Although the legislation has been passed, in order for it to be implemented, further detailed regulations are required. At the time of writing, the Scottish Government were planning to hold a formal consultation on the regulations in spring/summer 2017, with regulations in place by April 2018 at the latest. It is anticipated that the Scottish Government will consult with CAP (as with other stakeholders) and it is notable that CAP now have an office based in Scotland. Even with these additional changes in Scotland, advertising legislation for products licensed as medicines will continue to come under the MHRA framework. There are no current proposals to restrict domestic advertising in other countries of the UK.

3.3.7.2 Other restrictions

The Health (Tobacco, Nicotine, etc. and Care) (Scotland) Act also makes provisions for a number of further restrictions on the sale of e-cigarettes. This includes: a minimum purchase age of 18 (as exists in England); the power to prohibit their sale from vending machines; making it an offence to purchase an e-cigarette on behalf of someone under 18 ('proxy purchasing'); a requirement for e-cigarette retailers to register on the tobacco and nicotine vapour product retailer register; and a requirement that registered retailers should operate an age verification policy.

The Health (Miscellaneous Provisions) Act (Northern Ireland), passed by the Northern Ireland Assembly in March 2016, makes provisions for regulations prohibiting the sale of nicotine products to under 18s, prohibiting the sale of e-cigarettes from vending machines, and to create an offence for proxy purchasing. It also makes provisions for banning the use of e-cigarettes in enclosed vehicles when children are present, although regulations will be required to implement this.

The Public Health (Wales) Bill was rejected by Welsh Assembly Members in March 2016. The Bill proposed restricting the use of e-cigarettes in enclosed public places, although it did not include any additional marketing restrictions beyond the TPD. There was some speculation that the e-cigarette elements of the defeated Bill could be brought forward by the new Welsh Government that was elected in May 2016. However, Plaid Cymru, the nationalist party in Wales, made it clear that they would only support the nomination of the proposed Labour first minister for the Assembly if e-cigarette regulations were *not* included in a future Public Health Bill. It therefore appears extremely unlikely that there will be further regulations on e-cigarettes in Wales, beyond UK and TPD rules, in the near future.

In the Republic of Ireland, The Advertising Standards Authority for Ireland (ASAI) introduced rules for e-cigarette advertising on March 1st 2016 within the *Code of Standards for Advertising and Marketing Communications in Ireland.* The code, broadly similar to the existing CAP code in the UK, applies to e-cigarettes sold as consumer products and those which are authorised by the Health Products Regulatory Authority (HPRA), although only products authorised by the HPRA may make health or medicinal claims. To date no products have been registered as medicine products in Ireland.

The EU (Manufacture, Presentation and Sale of Tobacco and Related Products) Regulations 2016 transposing the Tobacco Products Directive have been signed into Irish law by the Minister for Health,

and came into effect on 20th May 2016. There are no proposals to further regulate domestic advertising in Ireland, although the Department of Health is proposing additional rules on the sale of e-cigarettes, including the introduction of a licensing system for e-cigarette retailers and prohibition of sales of e-cigarettes to, and by, under 18s.

3.3.8 Summary

Prior to the introduction of the TPD, the rules concerning e-cigarette advertising were set out in the CAP/BCAP code. Stakeholders had mixed views on the effectiveness and enforcement of the rules, for example, some felt that the rules did not go far enough to adequately control e-cigarette advertising while others felt that that less strict rules than those for tobacco were entirely appropriate given the considerable potential for e-cigarettes to benefit smokers. Generally, however, it was agreed that oversight on TV advertising under the code was working well. On May 20th 2016 new rules for e-cigarette advertising were introduced through Article 20 of the TPD, prohibiting advertising with cross-border impact, including TV, radio, print and sponsorship. UK-wide, the Department of Health has interpreted the TPD requirements within the Tobacco and Related Products Regulations 2016. However, some countries within the UK are proposing additional regulations. Scotland has passed legislation to place further restrictions on domestic advertising and there are plans in Scotland and Northern Ireland to impose additional restrictions on the sale of e-cigarettes.

4 CONCLUSIONS

This report includes findings from three different types of research. First, documentary analysis of print and online sources of data regarding the e-cigarette market in the UK. Second, a rapid review of the peer-reviewed international literature on e-cigarette marketing building on our previous work on this topic. Finally, an interview study, supplemented by a review of policy documents that describes previous and current e-cigarette marketing regulation in the UK. In this conclusion we summarise key findings from each element of the report and conclude with a brief discussion of research gaps and future research priorities on e-cigarette marketing.

4.1 The E-cigarette Market

Quantifying the size and scale of the UK's e-cigarette market is challenging but our description provides an overview of what is currently known here and in other major markets such as the USA. We found that terminology and data pertaining to e-cigarettes is inconsistent across a variety of sources. In some instances, the e-cigarette market is referred to as the 'vapour market' and split into 'e-cigarettes' and 'vapours, tanks, mods (VTMs) and personal vapourisers'. In others, 'e-cigarettes' is used as a homogenous term to describe the fragmented market comprised of first-generation e-cigarettes (also referred to as cig-a-likes and including disposable devices), second-generation e-cigarettes (fountain pen like, rechargeable and refillable) and third-generation e-cigarettes (also known as VTMs, personal vaporisers, modular units or open systems). This creates reported discrepancies on whether the tobacco industry (TI) owns the majority of the market or the independent sector dominates.

What is clear is that the global vapour market is valued at $11.92 billion. At present, this represents less than one percent of the tobacco market. The industry consensus is that the market will continue to grow and mature, reaching a projected market value of $50 billion by 2025/2030. Some analysts have suggested that annual sales of e-cigarettes could exceed those of tobacco by 2024. In the UK, the e-cigarette market in 2015 was estimated to be worth £445 million and is expected to grow by 15% to £510 million in 2017.

This market is separated into e-cigarettes (currently worth $1.6 billion in the US) made up of convenience stores, food, drug and mass retail channels ($700 million), online ($500 million) and other ($400 million) channels; VTMs and personal vapourisers (currently worth $2.5 billion in the US) comprised of vape shops ($1.4 billion), online and other retail channels ($600 million); and convenience-stores, food, drug and mass retail channels ($500 million).
The tobacco industry currently owns most of the leading e-cigarette brands, including in the UK. However, non-tobacco industry owned VTMs and personal vapourisers make up a large and increasing share of the vapour market.

Early investments were weighted heavily towards first-generation, disposable cig-a-likes, which mimic tobacco cigarettes more closely. However, these devices are being displaced in the UK by the rapid expansion of tank systems and of e-liquids. The majority (around 66%) of e-cigarette users in the UK are currently using tanks. This shift is also strongly evident in other leading western European markets.

Traditional retail channels such as supermarkets and high street shops are popular for first e-cigarette device purchases, but currently unable to attract some users to make subsequent purchases. Instead, users are opting for more advanced devices or information not available in traditional stores so go to specialised vape stores or purchase their devices online. Prices online for vapour products are

generally cheaper than they are in offline vape stores, especially for tank starter kits. The prices of tank products appear to be more standardised across websites, suggesting more stable demand.

According to some analysts, the decline in e-cigarette pricing is at least partly due to the expanding vapour category and development of VTMs and refills. Users are interested in products that are cheaper than tobacco cigarettes and there is little doubt that some types of e-cigarettes – particularly refillable devices – offer a more affordable option than taxed tobacco products in the UK.

If analysts' predictions are accurate, the vapour market will continue to expand globally in the coming years, even outstripping tobacco sales in a decade's time. Products, pricing, promotion and availability are likely to vary, however, depending on the regulatory environment and this is something that requires careful monitoring. Other key factors that will influence growth are the acceptability and appeal of the products to users, and industry investments, particularly from large companies.

4.2 Rapid Review of the E-cigarette Marketing Literature

The literature review element of our report focused on empirical, peer-reviewed studies published between January 2011 and March 2016 that used quantitative measures to examine the marketing of e-cigarettes. This is a substantial and growing literature and we found 73 studies published in 75 papers. The literature is dominated by studies from the USA. Only six studies were conducted in the UK and three from other parts of Europe (Finland, the Netherlands and Switzerland).

As we outline in the limitations section below (Section 4.4), the relevance of this fairly extensive literature for the current e-cigarette marketing environment in the UK is likely to be limited. The EU Tobacco Products Directive and additional incoming regulations in Scotland mean that the e-cigarette marketing environment has fundamentally changed, with all broadcast media banned, for example. However, it is possible to draw out key findings that may still apply to permitted forms of advertising and regarding any benefits and any potential hazards of marketing for smokers and non-smokers, adults and young people.

4.2.1 Nature of e-cigarette marketing

First, our review examined the nature of e-cigarette marketing including on social media, other promotion in the media, advertising spend and pricing, and marketing in retail environments.

Social media is used to promote e-cigarettes, both by manufacturers and retailers, and by vapers. We found a number of articles analysing YouTube videos and Twitter feeds. These types of studies are growing in number but do seem plagued by problems with distinguishing what is paid or unpaid for promotion by producers, and what is user-generated content. YouTube studies found limited promotion via chart music videos from 2013-2014 although this may have grown since. Other types of videos on YouTube contained e-cigarette content but study results are conflicting in describing the extent to which this is paid for advertising. One study of 265 videos between 2007 and 2011 found only 8.8% could be classified as advertising that was not user generated. E-cigarette content is prevalent on Twitter and two studies found between half and over two thirds of tweets to be commercial and promotional. Another study looking at individual Twitter accounts, however, found that the vast majority of people tweeting about e-cigarettes were users/vapers or vaping community and advocacy groups, rather than those actively selling e-cigarettes.

Few pricing studies were found but we touch on this in the future research section below. Price is a form of promotion as price can be used to market products. One EU study in 2014 found tobacco products were cheaper than e-cigarettes in most countries in Europe except in the UK where e-cigarettes were cheaper overall.

E-cigarette marketing in the retail environment has grown in recent years as a number of studies identified, including two in the UK. Some studies looked at general availability of products and those that compared this between years (in a UK study 2013 and 2014, and in the USA 2012 and 2013) found more products were available and more retailers were selling e-cigarettes. This is consistent with the growth in the market described in Section 3.1 of this report. In both these studies, in-store promotion also increased between the two years. The authors of both articles expressed concern about this – the US study focused on shops near college campuses and suggested that this type of promotion may contribute to youth use of e-cigarettes, and the UK study highlighted that e-cigarette point of sale displays were commonly located near products 'of interest to children' like sweets and gum.

4.2.2 Effects of marketing on children

A relatively small number of studies (nine) examined perceived and actual effects of e-cigarette marketing on children and young people under the age of 18, with two of these being from the UK.

This literature shows that in the USA and UK (and one study in Finland), children reported being aware of e-cigarette marketing. For example, in a representative survey of UK 11-16 year olds in 2014, four in ten reported seeing e-cigarette adverts on TV, one third on posters/billboards, one quarter adverts in print media and one in ten had heard e-cigarette adverts on the radio. Awareness or recall of some form of e-cigarette marketing was also high in the US studies all of which were conducted in 2013 and 2014. Exposure to e-cigarette marketing was lower in Finland in 2013 (10%) but an advertising ban had already been introduced in that EU country at the time of the study.

Some of the same studies also asked those who had tried e-cigarettes where they had obtained them. Across studies the most common source of access was friends (35.9%-79.9% between four studies), with commercial sources less frequent than informal sources. These studies were conducted during the period when age of sale restrictions were either not yet in place or very recently introduced.

One UK study looked at brand awareness and found this to be very low indeed: 84% of 11-16 year olds in a 2014 representative survey could not recall a single e-cigarette brand when asked.

Only two experimental studies with young people were identified but these are interesting as they aim to examine actual rather than perceived effects of marketing, albeit under 'laboratory' conditions. The study in England was with 11-16 year olds who had never smoked or vaped. Those assigned to view ads for e-cigarettes with flavoured e-liquids (vs unflavoured or no adverts) viewed these ads as more appealing and reported more interest in trying the products compared to the other groups. However, susceptibility to tobacco smoking was no different between the three groups after seeing the ads, which is reassuring given concerns that simply viewing adverts for e-cigarettes might prompt children to want to smoke tobacco. Although using a different design and focusing on different types of e-cigarette advertising from the UK study, an American experiment with young people who had never tried an e-cigarette found that viewing adverts did increase the appeal of these products and reported intention to try an e-cigarette, but viewing the ads did not affect participant's perceptions of the harmfulness of tobacco cigarettes.

4.2.3 Effects of marketing on adults

The literature on e-cigarette marketing and adults is more extensive than that for young people, at least within the 2011-2016 period covered by this review. As noted in the results Section (3.2.4), unfortunately none were conducted in the UK and therefore relevance may be limited. That said, there are some useful discussion points to highlight, and the experimental studies included are particularly interesting.

The largest body of literature in this section were cross-sectional studies examining recall of e-cigarette advertising. Awareness was generally higher than in the studies with children and the American studies demonstrated that a larger proportion of participants reported seeing some form of e-cigarette advertising compared to studies in the Netherlands (where the prevalence of e-cigarette use is lower than in the USA or indeed the UK) and New Zealand (where the domestic sale of nicotine containing e-cigarettes is illegal).

Studies also found that the extent of e-cigarette advertising increased over time. One American study used time-series analysis to look at Nielsen data for advertising reach between 2011 and 2013, focusing on 18-24 year olds (Duke et al. 2014). The exposure of this age group to television adverts for e-cigarettes grew by just over 300% during the study period. Likewise longitudinal research from the Netherlands found that participants (all smokers aged 16+) were more likely to report seeing e-cigarette ads during the two time periods studied – from 13.3% in the spring of 2013 to 36% at the same time the following year.

Exposure to e-cigarette advertising also varies between groups and across the studies we reviewed there were strong associations with smoking and vaping status. Overall, studies found that smokers were more likely to recall seeing e-cigarette advertising than non-smokers. One study also found that those who had observed others vaping were also more likely to recall being exposed to e-cigarette advertising. Likewise those that had ever tried e-cigarettes were more likely to report higher exposure to e-cigarette advertising than those who had never tried. All of these were cross-sectional studies so it is impossible to ascertain cause and effect, but these findings may arise for a number of reasons. First, are ads more prevalent in communities where there are more smokers or vapers? This is unlikely to be the explanation as most of the data relates to broadcast media rather than, for example, billboards or point of sale. Secondly, are ads more appealing to smokers? This is undoubtedly the intention of promotion (to encourage smokers to try or switch) in which case there may be benefits to this promotion. Vapers noticing ads is perhaps unsurprising as we tend to be more interested in a range of consumer products that we are familiar with. However, it also appears that marketing may not be a main source of information for people about vaping. In studies that assessed sources of information about e-cigarettes (all from the USA), participants were more likely to report friends, family or colleagues as sources of advice or accounts than any form of marketing (TV, print, point of sale).

Receptivity to e-cigarette adverts among general samples of adults was not particularly high, at least from one study in Hawaii with 18-40 year old undergraduates (Pokhrel et al. 2015). They were shown e-cigarette ads and asked whether they: liked them; found them funny; found them sexy; or wished they were like the people in the ads. For all the measures, more respondents voted negatively (ie. for 'liking' ads overall, 23.8% liked e-cigarette ads relative to other types of ads, and 41.2% liked them least compared to other types of ads). However those that reported they had ever used an e-cigarette were more likely to rate the ads positively.

The seven experimental studies with adults provide some of the most detailed results. All were from the USA. These support some of the findings from the surveys, in that at least one study found that

current e-cigarette users were more receptive to adverts (in this case for Blu branded e-cigarettes). The same study also found that smokers who had never tried an e-cigarette could be encouraged to think about trying one after viewing ads in the lab - 66% in Kim et al.'s (2015b) study - suggesting this could provide encouragement. Importantly, another experiment (Maloney & Cappella 2015) did not find that viewing e-cigarette ads changed smoker's existing desire to quit, and Pepper and colleagues (2014b) found that ads which communicated messages that e-cigarettes are: healthier than cigarettes; less expensive than cigarettes; or helpful to quit smoking; increased smokers' interest in trying e-cigarettes. This suggests that the content of marketing is important - although current regulations in many jurisdictions prevent companies from making health claims which does restrict what can be communicated to consumers.

4.3 Regulatory Framework for E-cigarette Marketing

Section 3.3 of our report aimed to describe the development of e-cigarette marketing in the UK and the previous regulatory framework, before moving on to describe recent changes introduced following the transposition of the EU Tobacco Products Directive into UK law. What is clear is that approaches to regulating marketing changed over time as e-cigarette use increased, and occurred at least in part because of concerns about these products. Whether or not the current regulatory framework strikes the right balance between still permitting some marketing and protecting the public (particularly children) from promotion that may have adverse consequences, is the source of much debate. The current framework removes cross-border advertising (including all broadcast media) but not domestic marketing such as billboards and print media ads. Even these forms of marketing will soon be outlawed in Scotland (but not in other parts of the UK) once regulations supporting the 2015 Health (Tobacco, Nicotine etc and Care) Act of the Scottish Parliament are introduced, likely next year. As we outline above, it is important that future research evaluates the impact of these changes and any future restrictions. The UK public health community has a consensus statement which makes clear that e-cigarettes are safer than continued smoking and that they have a useful role to play in tobacco harm reduction. Whether the current marketing regulations framework is consistent with supporting more smokers to switch to less harmful nicotine-containing devices is unclear, and this needs studied. The challenge in all of this is to harness the promise of e-cigarettes and other vapour products while not promoting them to those groups (non-smokers, never smoking children who would not otherwise have smoked) for whom e-cigarette use almost certainly has no benefit.

4.4 Future Research

In reviewing the information collected for this report it becomes apparent that there are a significant number of gaps in relation to both research and policy on electronic cigarettes and other vaping devices.

The first section of this report focused on the e-cigarette market and provided an overview which contains partial information. In the time available for our study, we identified that it is very difficult to gain an accurate picture of which products, brands, and companies dominate in the UK market. E-cigarettes are a rapidly changing class of products and information becomes quickly out of date. There is a need for ongoing review and research of the dynamics of the e-cigarette market and also critical analysis of the approaches and strategies employed by different companies and actors in that market. Two authors of this report (de Andrade and Angus) are involved in a larger CRUK funded study on this topic which is due to report in 2017. We anticipate that this will update and expand on the overview we have provided here, and also suggest future research questions not only relevant to the UK but further afield.

Our rapid review of the literature had a number of limitations in that it focused just on studies between 2011 and 2016. It was also limited to quantitative research, using search terms we have employed in our previous reviews. There is a growing qualitative literature on e-cigarettes including some studies on marketing which could be examined in future reviews. We also found that many of the studies we included had questions on marketing (particularly those looking and youth and adult responses to marketing) as part of a larger survey or longitudinal study and therefore did not examine the issues in depth. Most of the data we identified was also cross-sectional in nature and therefore cannot demonstrate causality, making conclusions about the impact of marketing difficult to make. Finally in terms of limitations, there are still relatively few studies conducted on this topic in the UK and given the country specific nature of some marketing this is warranted.

The literature review also identified some clear priorities for future research. There is a need for studies on e-cigarette branding and awareness and appeal of different brands. This is not straightforward given the number of brands on the market, differences between countries and changes in brand names and ownership. However it is worth future examination. We also found no studies with children under the age of 11 that ask questions about e-cigarette marketing. We also found no UK studies on adult's responses to e-cigarette marketing, which is surprising given the volume of research on e-cigarettes that researchers based in this country are conducting. Finally, there is a clear need for better designed research, using experimental and longitudinal designs that can aim to separate cause from effect. Even in the UK where most e-cigarette marketing is now prohibited under the TPD, the forms of marketing that remain should be the focus of future research, both to identify positive effects (encouraging smokers to try vaping, for example) and any unintended consequences, particularly for never smoking young people.

The policy and regulatory changes we describe in the final section of our report also provide opportunities for future study. Importantly, the new TPD regulations impose restrictions on the advertising of e-cigarettes. This will have likely implications for the development of the e-cigarette market and future product promotion. It has been predicted that there may be an increase in advertising among non-restricted media such as billboards. There is also uncertainty over how advertisers will approach non-nicotine containing products. The potential impact of all of these things on young people and adults, non-smokers and smokers needs exploration. It is important that regulation strikes the right balance by addressing potential inappropriate promotion to non-smokers while providing smokers with the information they need to try e-cigarettes and to switch to them as an alternative to tobacco. How will regulation affect knowledge, attitudes and behaviour regarding e-cigarettes? Further, it would be useful to know the approach of other EU member states, to compare the environment in which e-cigarettes are sold and promoted in the UK to that of other countries, and investigate the implications of any differences.

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APPENDICES

Appendix 1: Rapid review data extraction headings

1. study objective(s): *for the whole study, not just marketing objectives*
2. study details/methods
    a. study design
    b. intervention groups
    c. number of experiments
    d. equipment
    e. exposure
    f. measurement conditions
3. target population: *include country*
4. sample size
5. measures: *all marketing measures (and any variables the marketing variables are related to in the results)*
6. outcomes
7. major conclusions *the authors' own*
8. limitations: *the authors' own; additional reviewers'*
9. funding source / author disclosures / conflicts of interest.