Plain Tobacco Packaging: A Systematic Review

Crawford Moodie[a,d], Martine Stead[a,d], Linda Bauld[a,d], Ann McNeill[c,d], Kathryn Angus[a,d], Kate Hinds[b], Irene Kwan[b], James Thomas[b], Gerard Hastings[a,d], Alison O'Mara-Eves[b]

a: Institute for Social Marketing & CRUK Centre for Tobacco Control Research, Stirling Management School, University of Stirling

b: EPPI Centre, Institute of Education, University of London

c: Division of Epidemiology & Public Health, University of Nottingham

d: UK Centre for Tobacco Control Studies

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ABBREVIATIONS

ASH UK	Action on Smoking and Health UK
AUS$	Australian dollars
B&H	Benson & Hedges
BAT	British American Tobacco
CBRC	Centre for Behavioural Research in Cancer
CCLAT	la Convention-cadre de lutte anti-tabac
CI	confidence interval
CNCT	Comité National Contre le Tabagisme
CRUK	Cancer Research UK
CTCR	Centre for Tobacco Control Research
DH	Department of Health (UK)
EPPI Centre	Evidence for Policy and Practice Information and Co-ordinating Centre
EC	European Commission
EU	European Union
FCTC	Framework Convention on Tobacco Control
HM Government	Her Majesty's Government (UK)
ISM	Institute for Social Marketing
ITC	International Tobacco Control
JTI	Japan Tobacco International
KT&G	Korean Tobacco and Ginseng Company
KS	King Size
L&B	Lambert & Butler
MYO	make your own
MP	Member of Parliament
MWV	MeadWestvaco
NHS	National Health Service (UK)
OR	odds ratio
PHRC	Public Health Research Consortium
POS	point of sale
QATSO	quality assessment tool for systematic reviews of observational studies
QR	Quick Response bar code
RYO	roll your own
TAPA	Tobacco Advertising and Promotion Act (UK)
TDR	Tvornica Duhana Rovinj
TVNZ	Television New Zealand
UK	United Kingdom
UKCTCS	UK Centre for Tobacco Control Studies
USA	United States of America
WHO	World Health Organization

EXECUTIVE SUMMARY

Introduction and Methods

This systematic review outlines findings from 37 studies that provide evidence of the impacts of plain tobacco packaging. The review was conducted following the publication of the March 2011 White Paper *Healthy Lives: Healthy People* which set out a renewed Tobacco Control Plan for England. One of the key actions identified in the plan was to consult on possible options to reduce the promotional impact of tobacco packaging, including plain packaging. This systematic review was commissioned to provide a comprehensive overview of evidence on the impact of plain packaging in order to inform a public consultation on the issue.

The report begins with an introduction that briefly describes how tobacco marketing and packaging have been regulated to date, and outlines the origins of plain packaging as a potential policy measure. A contextual section discusses how tobacco packaging has evolved and its multi-functional role in promoting tobacco products.

The Framework Convention on Tobacco Control (FCTC) proposes that plain packaging would have three benefits: it would reduce the attractiveness and appeal of tobacco products, it would increase the noticeability and effectiveness of health warnings and messages, and it would reduce the use of design techniques that may mislead consumers about the harmfulness of tobacco products. The review aimed to examine all available current evidence on the effects of plain packaging in these three areas. It employed systematic review methodology and examined studies from 1980 to the present day. The review focused on primary research but did not put limits on study design. Some systematic reviews include only randomised controlled trials of interventions, but we were aware that this type of evidence cannot exist for plain packaging as plain packaging has not yet been implemented in any jurisdiction. The review therefore looked at all feasible study designs. We searched 21 electronic databases from the fields of health, public health, social science and social care. For the databases, a comprehensive search strategy was developed and tested. We also searched websites, Google Scholar and the tobacco industry's legacy library. We carried out citation chasing and contacted experts to find further studies. Studies were managed by EPPI-Reviewer 4.0, the EPPI-Centre's online review software.

A total of 4,518 citations were identified following initial searching, and after screening and quality appraisal 37 studies were included. Data were extracted from each of these to inform a narrative synthesis organised around five main headings: appeal of cigarettes, packs and brands; salience of health warnings; perceptions of harm; smoking-related attitudes and behaviour; and barriers and facilitators to the introduction of plain packaging.

Appeal of Cigarettes, Packs and Brands

This section of the review outlines findings on how plain packs impact on the appeal of cigarette products, packs and brands. Findings focused on three main elements of appeal: attractiveness, quality, and smoker identity and personality attributes associated with the brand, with key messages from qualitative studies and differences between sub-populations in the studies presented separately.

In terms of attractiveness, 19 studies examined perceptions or ratings of the attractiveness of plain packs (16 cross-sectional surveys, two mixed methods studies including a cross-sectional survey element and one intervention study). All these studies found that plain packs were rated as less attractive than branded equivalent packs, or were rated as unattractive, by both adults and children. Those studies that tested a range of branded and unbranded packs found that this difference

increased as progressively more branding elements and descriptors were removed; in other words, the plainer the pack, the less attractive.

Twelve studies (ten cross-sectional surveys, one mixed methods study and one intervention study) examined perceptions of the quality of plain packs in terms of perceived quality, taste, smoothness and cheapness. The studies which compared perceptions of plain and branded packs consistently found that plain packs were perceived to be poorer quality by both adults and children. The study which compared different colours of plain packs, without comparing them with branded packs, found that lighter coloured packs were generally associated with weaker taste.

Thirteen studies examined perceptions of smoker identity and personality attributes associated with plain packs (nine cross-sectional surveys and three mixed methods studies). Plain packs consistently received lower ratings on projected personality attributes (such as '*popular'* and '*cool'*) than branded packs. Visual experiments which measure the strength of association between specific brands and person types found an association between particular brands and smoker identity and saw that this association weakened or disappeared with plain packaging. Studies that looked at whether a pack was perceived to be targeted at particular 'types' of smokers found that plain packs were perceived as being more likely to be smoked by 'older' or 'less fashionable' people than branded packs.

In the ten qualitative studies that examined appeal, four key themes emerged to explain why plain packs were consistently rated as less attractive and lower quality and had a poorer image than branded packs. These were that: plain pack colours have negative connotations; plain packs weaken attachment to brands; plain packs project a less desirable smoker identity, and plain packs expose the reality of smoking.

From the studies which examined sub-group differences in the appeal and attractiveness of plain packs, some patterns emerged. Non-smokers tended to find plain packaging less appealing than did smokers, and younger respondents tended to find it less appealing than did older respondents. Gender differences were examined in one study, which suggested that women found plain packaging less appealing than did men. No consistent differences emerged from the studies which explored differences by ethnicity or socio-economic status.

Salience of Health Warnings

This section of the review outlines findings on how plain packaging impacts upon the salience of health warnings, in terms of recall, attention, seriousness and believability.

Twelve studies (three cross-sectional surveys, three mixed methods studies, one intervention study and five qualitative studies) examined whether plain packs increase people's ability to notice and recall the health warnings on packs or whether plain packs affect the perceived seriousness and believability of the warnings. One of the survey studies measured eye movements to measure visual attention to packs, while the other survey and mixed method studies briefly showed participants different plain and branded packs and then asked them what they recalled, using either unprompted or prompted measures or both.

Of the seven studies which statistically compared responses to warnings on plain packs and branded packs, four studies suggested that plain packaging increases the salience of health warnings, one study found no difference, and two found mixed results. The impact of health warnings appeared to be influenced by the size, type and position of the warnings used in the studies. One study which recorded eye movements as an indicator of attention paid to warnings suggested that non-smokers and weekly smokers paid more attention to warnings on plain packs than did daily smokers. No study examined gender, age or other socio-demographic differences.

From the qualitative studies, two themes emerged: that plain packs were perceived as having less 'clutter' on them to detract from the health warning, and that the dullness and seriousness of the packs enhanced the seriousness and believability of warnings.

Perceptions of Product Harm and Strength

This section of the review outlines findings on the impact of plain packaging upon perceptions of the harmfulness and strength of cigarette products, packs and brands.

Sixteen studies (13 cross-sectional studies, one intervention study and two qualitative studies) examined whether and how perceptions of the harmfulness and strength of plain packs differ from perceptions of the harmfulness and strength of branded packs, or how different kinds of plain packs differ in terms of perceived harmfulness and strength. Perceptions of harmfulness and strength were assessed in several ways, by asking respondents which packs: would deliver the most tar and/or nicotine or would be 'lighter' in tar; were a greater risk to health compared to other brands; would be associated with greater or lesser harm; would trigger discussions on harmfulness; inform the smoker about the health effects; and would be more likely to make you think that the cigarettes inside were dangerous. Perceptions of harm also included questions on which packs you would purchase if trying to reduce the risks to health or which were perceived as 'easier to quit'. From a public health perspective, all conventional cigarettes pose a similar health risk; smokers can alter the way they smoke cigarettes of different tar and/or nicotine machine-measured yields in order to compensate for differences and satisfy their nicotine addiction. In addition there is no evidence that brands differ in ease of quitting. As brightly coloured and attractive branded packs can reduce perceptions of the harmfulness of cigarettes, the desired outcome of these studies is that plain packs should be perceived as equally harmful as, or more harmful than, branded cigarettes, and plain packs should be seen as equally easy to quit as branded cigarettes or harder to quit.

The 14 studies which used quantitative methods to examine the impact of plain packs on perceptions of harm and strength found that findings were mixed as perceptions varied according to the colour of the plain pack. In general, darker coloured plain packs were seen as more harmful, and lighter coloured plain packs less harmful, than branded cigarettes. This indicates that misperceptions about the relative harmfulness of cigarettes were reduced when darker coloured plain packs were shown. Descriptor terms such as 'gold' or 'smooth' also affected response: in general, plain packs without descriptors were perceived as more harmful than packs with descriptors. This suggests that descriptor terms have the potential to mislead consumers about harm when used on plain packs, as on branded packs. Studies which examined perceptions of which pack was more effective in terms of raising awareness of health risk tended to find that plain packs were perceived as more effective than branded packs.

The studies which compared sub-group differences in response found that in general, smokers were more likely to have misperceptions about the harmfulness of packs, both plain and branded, than smokers. Few direct comparisons were made in respect to age, gender or other socio-demographic differences, and no consistent pattern emerges from these.

Smoking-related Attitudes, Beliefs, Intentions and Behaviour

This section outlines findings from 16 studies that examined whether and how plain packs impact on smoking-related attitudes and beliefs, the perceived impact of plain packs on smokers and young people in general, and the perceived impact of plain packs on respondents' own smoking-related intentions and behaviours.

Two studies found that plain packs were associated with more negative feelings about smoking and one study showed that plain packs were less likely than branded packs to reinforce beliefs among women that smoking helps people to stay slim or control their appetite; a fourth study found that plain packs had no impact on beliefs about smoking and weight control.

Seven studies asked participants how the introduction of plain packs might impact on the smoking behaviour of smokers in general and/or young people in general. The overall pattern of findings is mixed, but tends to be supportive of plain packaging being perceived to have a likely deterrent effect on smoking. In three of the five studies which examined perceptions of the impact on young people, plain packs were perceived as likely to reduce onset of smoking by young people, while in the other two studies which examined this, plain packs were perceived as no more likely than branded packs, or only slightly more likely than branded packs, to reduce the amount that young people smoked. Among the four studies which examined perceptions of the impact of plain packs on smokers in general, plain packs were perceived as likely in three of the studies to encourage smokers to reduce their consumption or to quit.

Four studies examined the potential impact of plain packs on participants' own smoking behaviour. Again the overall pattern is mixed but tends to be supportive of plain packaging having a deterrent effect on smoking. A naturalistic intervention study (Moodie et al 2011b) found that when young adults in Glasgow put their own cigarettes in plain packs they were more likely to think about quitting and to want to quit. Likewise, a survey in New Zealand (Hoek 2011a) found that respondents exposed to minimally branded or plain packs were more likely to say that they would engage in cessation-related behaviours. The other two studies reported mixed results, with existing smokers tending to feel that plain packs would make no difference to them, and non-smokers tending to feel that plain packs might deter them from smoking, or having mixed views on this. The seven studies using qualitative methods identified similar themes, suggesting that plain packs were perceived as likely to trigger thoughts of quitting, strengthen determination to quit, or to remove one form of temptation.

Studies that looked at differences in response by smoking status tend to suggest that non-smokers and lighter/less regular smokers are more likely than smokers and heavier/more regular smokers to perceive that plain packs would discourage the onset of smoking, encourage cessation or reduce consumption. Studies that looked at differences by age tend to suggest that younger respondents were more likely than older respondents to perceive that plain packs would discourage the onset of smoking, encourage cessation or reduce consumption. No differences were reported by gender.

Facilitators and Barriers to the Introduction of Plain Packaging Policies

This section of the review outlines findings on issues that can be described as facilitators and barriers to the introduction of plain packaging. Twelve of the studies included in the review addressed these, focusing on three main themes: public opinions of plain packaging policies, benefits or harms of plain packaging, and studies that address the harms identified.

Six studies included material on what the public would think about the introduction of plain packaging. Five of the studies were conducted in Australia and no UK studies were included. The studies reported varying levels of support, with the overall pattern suggesting a slight majority in favour. Non-smokers were more likely to approve than smokers.

Five qualitative studies explored views of particular benefits or harms that could result from plain packaging. Suggested benefits included that plain packaging could reduce tobacco consumption, by 'inconveniencing smokers' and by deterring young people from starting smoking, and that plain packaging would reinforce messages about the health risks of smoking by making the health warning

more prominent. It was also suggested that plain packaging would make cigarette packs look different by removing their branding, underlining the difference between tobacco and other consumer products that do not present such a danger to health. A further suggested potential benefit to the consumer was that the packs would be cheaper to produce, resulting in a reduction in price.

Four suggested potential harms were also identified in qualitative studies. First, that plain packs could increase the appeal of smoking to young people by making it 'forbidden', and second, that this could increase tobacco smuggling. Thirdly, it was suggested that plain packaging might increase the time taken by shop assistants to locate the correct brand. Finally some smokers expressed the view that they or others might not be able to differentiate or choose between brands when plain packaging was introduced.

Two of the harms identified – problems with brand identification and increased transaction times – were explored in other studies in the review. An experiment with young Canadian smokers found that plain packaging would not affect brand recall, and a study with young people found that the information on plain packs would be easier to process than the branded packs and would not affect brand choice. Finally an Australian study tested purchasing arrangements for branded and plain packs on a university campus and found that the average transaction time was significantly quicker for plain packs compared to branded packs.

Discussion

This review found that there is strong evidence to support the propositions set out in the Framework Convention on Tobacco Control relating to the role of plain packaging in helping to reduce smoking rates; that is, that plain packaging would reduce the attractiveness and appeal of tobacco products, it would increase the noticeability and effectiveness of health warnings and messages, and it would reduce the use of design techniques that may mislead consumers about the harmfulness of tobacco products. In addition, the studies in this review show that plain packaging is perceived by both smokers and non-smokers to reduce initiation among non-smokers and cessation-related behaviours among smokers. The review also found some evidence of public support for plain packaging, although the majority of the public opinion studies were conducted in Australia.

The review had a number of strengths and limitations. Strengths include the diversity of research methods used in the studies, the diversity of samples and study sites, the different types of plain packaging assessed and the consistency of the findings across studies. The main limitation was that because plain packaging has yet to be introduced in any country, it has not yet been possible to evaluate the impact of the policy in practice. Individual studies in the review were also limited by elements of study design. For example, many of the surveys included convenience sampling and reporting was of variable quality in some of the articles and reports examined. In addition a number of types of literature were not covered by the review including internal tobacco industry documents and marketing practices. Despite these limitations there was consistency in study findings regarding the potential impacts of plain packaging. This consistency of evidence can provide confidence about the observed potential effects of plain packaging. If and when introduced, existing evidence suggests that plain packaging represents an additional tobacco control measure that has the potential to contribute to reductions in the harm caused by tobacco smoking now and in the future.

1 INTRODUCTION

This introductory section briefly describes how tobacco marketing has been regulated to date (1.1), how packaging specifically has been regulated and the potential public health benefits of plain packaging (1.2), and then outlines the aim and scope of the review (1.3).

1.1 Regulation of Tobacco Marketing

Smoking is the largest cause of avoidable morbidity and mortality and of health inequalities in the UK. It causes over 100,000 deaths every year (HM Government 2011) and costs society £14 billion (Policy Exchange 2010). Globally, tobacco is responsible for the death of one in ten adults worldwide, equating to over five million deaths each year (WHO 2011a). Cigarettes contain over 4000 chemicals of which 60 are known or suspected carcinogens, such as cadmium, phenol and hydrogen cyanide (Mackay et al 2006). Smoking harms nearly every organ of the body and is a leading cause of cancer, heart disease, respiratory disease and a range of other conditions (US Surgeon General 2004). Each year more than 80,000 people in England die prematurely from a smoking related disease (The NHS Information Centre 20011). Although smoking rates have halved since the main health risks were first reported in the 1950s, approximately 10 million people in the UK continue to smoke – just over one in five of the adult population (Office for National Statistics 2009).

In an effort to reduce smoking rates, a number of tobacco control measures have been put in place since the 1960s to restrict how tobacco products are promoted and sold. One of the first in the UK was the Television Act in 1964, which banned advertisements for cigarettes on television. Additional restrictions on tobacco marketing were introduced in the decades following the Television Act. However it is the last decade, with the implementation of the Tobacco Advertising and Promotion Act (HM Government 2002a), that has witnessed the most significant changes to the tobacco marketing landscape. It is also within this same period that the UK became a Party to the Framework Convention on Tobacco Control (FCTC), the first international treaty negotiated under the auspices of the World Health Organization (WHO). The FCTC was adopted by the World Health Assembly on 21 May 2003 and entered into force on 27 February 2005 (WHO 2005), and at the end of 2011 had 174 Member Parties. It aims to reduce the adverse social, health and economic impacts associated with tobacco use (WHO 2011b) and includes a number of supply and demand measures intended to help prevent smoking initiation and encourage cessation. The FCTC defines tobacco advertising and promotion as *"any form of commercial communication, recommendation or action with the aim, effect or likely effect of promoting a tobacco product either directly or indirectly"*, and tobacco sponsorship as *"any form of contribution to any event, activity or individual with the aim, effect or likely effect of promoting a tobacco product or tobacco use either directly or indirectly"* (WHO 2005, p4). Article 11 of the FCTC relates to packaging and labelling of tobacco products and Article 13 relates to tobacco advertising, promotion and sponsorship.

Prior to the FCTC entering into force, but consistent with Article 13, the Tobacco Advertising and Promotion Act (TAPA) was implemented in the UK between 2003 and 2005. The TAPA banned or restricted most forms of permissible tobacco advertising, promotion and sponsorship (see Table 1.1). The final phase of the TAPA in 2005 coincided with the EC Tobacco Advertising Directive, which prohibited tobacco sponsorship and advertising with a cross-border dimension, for example, in print, radio or the internet. The TAPA and the Tobacco Advertising Directive have significantly restricted opportunities to market tobacco products in the UK. Neither the display of tobacco products within the retail environment nor the use of branded packaging was subject to regulation, however, although the explanatory notes for the TAPA did provide reserved powers for the UK Government to

control displays of tobacco products if these became quasi-advertisements (HM Government 2002b). More recently, the Health Act 2009 has extended the TAPA to end the open display of tobacco products in England, Wales and Northern Ireland. The legislation will come into place in England for large shops (mainly supermarkets) in April 2012 and all other shops retailing tobacco products in April 2015. Similar provisions for Scotland are set out in the Tobacco and Primary Medical (Scotland) Services Act 2010.

Table 1.1: Phases involved in implementation of TAPA across the UK

Phase	Implementation date	Effect of ban
1	Feb 2003	Advertising on billboards, cinemas, and general press (newspapers and magazines)
2	May 2003	Direct mail and on-pack promotions
3	July 2003	Domestic sponsorship
4	Dec 2004	Restrictions on point-of-sale advertising (limiting size of advertising in-store to A5)
5	July 2005	Brand sharing and international sponsorship

1.2 Regulation of Tobacco Packaging

By 2009, 26 countries were reported to have 'complete' bans on tobacco marketing (WHO 2009). However, these bans do not cover all marketing media, with branded packaging a notable exclusion. This has led to growing interest in the public health ramifications of packaging in many countries. Three aspects of packaging have attracted particular attention: health warnings, pack descriptors, and the concept of plain packaging.

1.2.1 Health Warnings

At present, cigarette packages in most countries carry a health warning, although the size, position, and nature of these warnings vary considerably across jurisdictions.

The 2011 WHO report on the global tobacco epidemic highlights that consumers of tobacco products have a 'fundamental right to accurate information about the risks of smoking' and that a basic requisite for reducing tobacco use is that every person be informed of the health consequences, addictive nature, and potential for disability and premature death posed by tobacco consumption and exposure to tobacco smoke (WHO 2011b, p18). Health warnings on tobacco packages have emerged as an important medium for communicating these health risks. Warnings have very high reach and frequency of exposure among smokers; a 20 pack a day smoker is potentially exposed to these warnings over 7000 times per year. These warnings also provide an opportunity to communicate with smokers during the act of smoking. In addition, as tobacco packaging is displayed each time the product is used and is often left in view of others between use, this results in high levels of exposure to the health warnings among non-smokers as well (Hammond 2011).

There is strong evidence that prominent warnings are effective in increasing perceptions of risk, including beliefs about specific health effects (Hammond 2011). Health warnings on cigarette packages are among the most prominent sources of health information in many Western countries. Indeed, more smokers report getting information about the risks of smoking from packages than any other source except television (Hammond et al 2006). There is also evidence that beliefs about specific health effects increase following implementation of health warnings for the same effects (Hammond 2011). Although some smokers use techniques to avoid being exposed to the warnings, mainly those not wanting to quit or those wanting to quit but having trouble doing so, even then the

warnings are considered to have achieved their function given that the pack no longer holds the same appeal (Cavalcante 2003). Prospective research has also found that missing out on cigarettes as a direct result of noticing the health warnings predicts quit attempts among smokers (Borland et al 2009).

The use of on-pack warnings was first required in 1971, as a result of an agreement between the UK Government and the tobacco industry. These health warnings, included on one of the side panels on all cigarette packets, carried the message "WARNING by H.M. Government, SMOKING CAN DAMAGE YOUR HEALTH". Almost 20 years later, in accordance with European Commission (EC) Directives 89/622 and 92/41 1989, health warnings across the European Union (EU) were required to cover at least 4% of the principal display areas of the pack (although for countries with two official languages this increased to 6% of both main display areas, and to 8% for countries with three official languages). The current Tobacco Products Directive (2001/37/EC) stipulates that warnings should cover 30-35% of the front and 40-50% of the back of tobacco packs in all EU states, a significant increase from the Directives it abrogated. With bordering, these updated warnings cover 43% of the front and 53% of the back of packs.

All cigarettes on display in the UK were required to feature these larger warnings by October 2003, and October 2004 for all other tobacco products. As specified by the Tobacco Products Directive, 14 specific warnings were to be used on the reverse of the pack alongside two general warnings on the front of the pack. In May 2005, the European Commission adopted a library of 42 images (three images for each of the 14 specific warnings) which EU member countries were permitted to use on the reverse panel of tobacco packs, if they chose to do so. Although not obliged to do so, the UK Government decided to use these 'pictorial' warnings, which were to be displayed on all cigarette packs sold by October 2008 and all other tobacco products by October 2009.

1.2.2 Pack Descriptors

Another element of packaging that has received policy attention is the use of descriptors that may mislead consumers about product harm. Article 11.1(a) of the FCTC specifies that Parties shall implement measures to ensure that tobacco packaging and labelling does not promote a tobacco product by any means which are false, misleading, deceptive or likely to create an erroneous impression about the product's characteristics, health effects, hazards or emissions, including any term, descriptor, trademark or figurative or other sign that directly or indirectly creates the false impression that a particular tobacco product is less harmful than others. These may include terms such as 'low tar', 'light', 'ultra-light' or 'mild' (WHO 2005). These descriptors were already banned in the EU in accordance with the current Tobacco Products Directive. Since October 2003 no legally manufactured tobacco products within the UK have been allowed to use these descriptors, which are no longer permitted in a total of 89 countries (WHO 2011b).

1.2.3 Plain Packaging

In 1976 French retail chain Carrefour launched a line of low-priced foodstuffs sold in plain white packages (Prendergast & Marr 1995). The concept of plain packaging to reduce the appeal of tobacco products was first suggested a decade later, in 1986, by a Canadian doctor at the annual meeting of the Canadian Medical Association. In 1989, the New Zealand Department of Health's Toxic Substance Board recommended that cigarettes be sold in white packs with simple black and white text and no colours or logos. Following on from this, in 1992, the Australian Ministerial Council

on Drug Strategy requested a report on plain packaging, and in 1994 the Canadian House of Commons Standing Committee on Health opened hearings on plain packaging.

Interest in plain packaging has revived again in recent years. In 2007 the European Commission considered plain packaging as a possible policy option in the second report on the application of the current Tobacco Products Directive, stating that '*in order to decrease the smoking initiation and to protect EU consumers on equal basis in all Member States the introduction of generic (black & white) standardised packaging for all tobacco products could be explored as a possibility to reduce the attractiveness*' (European Commission 2007). In 2008, France placed plain packaging on the agenda at EU level during its Presidency of the EU, and the UK Department of Health addressed plain packaging in a consultation on the future of tobacco control. The following year, the Finnish Minister of Health and Social Services Paula Risikko recommended to the then Commissioner for Health Androulla Vassiliou that plain packaging should be introduced at EU level, and an Australian Senator Steve Fielding tabled a Private Members Bill that would involve the plain packaging of tobacco products. In this same year, Lithuanian MP Gediminas Navaitis registered a draft law to add an article to the Law on Tobacco Control proposing the introduction of plain packaging, which the Lithuanian Parliament rejected in 2010 (International Law Office 2010). The European Commission consulted in 2010 on the possible revision of the current Tobacco Products Directive, including questions about tobacco packaging. The idea was again raised in the UK by the Government in *A Smokefree future: A Comprehensive tobacco control strategy for England* (HM Government 2010). In April 2011, Belgian MP Catherine Fonck tabled a bill in the Belgium House of Representatives that would amend existing legislation on the protection of consumer health with respect to food and other products, and see plain tobacco packaging introduced from January 2013. In July 2011, Siv Fridleifsdottir, a member of the Iceland Parliament and a former national Minister of Health, announced plans to introduce a private member's bill in Parliament with a series of tobacco control measures, including plain packaging (Pidd 2011).

The first country to decide to implement plain packaging is Australia, which announced its plan to introduce plain packaging from 2012 (Australian Government 2010). In New Zealand, the report of the Māori Affairs Committee to the House of Representatives in recommended implementing plain packaging at the same time as is planned in Australia (Report of the Māori Affairs Committee 2010).

1.2.4 The Proposed Public Health Benefits of Plain Packaging

The guidelines for the implementation of Article 11 of the FCTC, adopted at the third Conference of Parties to the FCTC, suggests that plain packaging might be expected to deliver public health benefits in three ways. It "may:

1. increase the noticeability and effectiveness of health warnings and messages;
2. prevent the package from detracting attention from them [health warnings]; and
3. address industry package design techniques that may suggest that some products are less harmful than others". (WHO 2008a, p8).

It is difficult to separate the first two of these proposed benefits, as increasing the noticeability of health warnings on the pack, a necessary precursor to effectiveness given that warnings that cannot be seen cannot be effective (Moodie et al 2010), is dependent upon preventing the pack graphics and structural design (shape, size and method of opening) from detracting attention from the warnings in the first place. The guidelines for the implementation of Article 13 of the FCTC explain that "tobacco pack or product features are used in various ways to attract consumers, to promote products and to cultivate and promote brand identity, for example by using logos, colours, fonts,

pictures, shapes and materials on or in packs or on individual cigarettes or other tobacco products" (p2). The guidelines for Article 13 recommend plain packaging to eliminate the effect of advertising and promotion on packaging and also the product: "there should be no advertising or promotion inside or attached to the package or on individual cigarettes or other tobacco products" (WHO 2008b, p7). Section 2.4 discusses in more detail how pack elements such as graphical design, shape and colour are currently used to attract consumers and to convey information and suggestions about the harmfulness of products.

The Australian Government's recent decision that all tobacco products sold in Australia would be in plain packaging from 2012 is based on the rationale for plain packaging outlined in Articles 11 and 13 of the FCTC. Its legislative proposal on plain packaging "aims to:

1. reduce the attractiveness and appeal of tobacco products to consumers, particularly young people;
2. increase the noticeability and effectiveness of mandated health warnings; and
3. reduce the ability of the retail packaging of tobacco products to mislead consumers about the harmful effects of smoking or using tobacco products" (Australian Government Department of Health and Ageing 2011).

1.3 Review Aims and Scope

Healthy Lives, Healthy People: A tobacco control plan for England, published by HM Government in March 2011, aims "to drive down the prevalence of smoking and to support comprehensive tobacco control" (HM Government 2011, p5). One of the key actions identified in the Tobacco Control Plan is to consult, by the end of 2011, on possible options to reduce the promotional impact of packaging, including plain packaging. This systematic review examines current evidence on the effects of plain packaging, in the three areas outlined in the FCTC, ie. whether plain packaging reduces the attractiveness of tobacco products, whether it increases the noticeability and effectiveness of warnings, and whether it reduces the use of pack design techniques that might mislead consumers about the harmfulness of tobacco products.

1.3.1 Review Aims

The primary aim of this review is to assess the impact of plain tobacco packaging on the:

1. appeal of the packaging or product;
2. salience and effectiveness of health warnings; and
3. perceptions of product strength and harm.

The secondary aims are to assess any other potential impacts (benefits or disbenefits) of plain packaging not identified by the FCTC; examine whether the effects of plain packaging vary by gender, age, socio-economic status and ethnicity; and describe the facilitators and barriers to the introduction of plain packaging identified within the included studies.

1.3.2 Scope of Review

This review sought to identify all research on plain tobacco packaging which specifically assessed one of the three areas identified by FCTC. It has not, however, examined the potential public health

benefits of non-packaging-related tobacco control measures, or the economic, legal or trade implications of plain packaging or any impact that plain packaging might have on the illicit trade of tobacco products.

Plain packaging is defined in the review as: the standardisation of pack colour and removal of all branding from packaging, with the exception of brand name which appears in a standardised font, typeface and position on the package. Some definitions of plain packaging are more explicit, and also cover the standardisation of pack shape, size and method of opening. In all definitions, however, relevant legal markings, such as health warnings and tax stamps, are retained.

2 CONTEXT: THE MULTIFUNCTIONAL ROLE OF TOBACCO PACKAGING

As context for the findings in this systematic review, this section examines how tobacco packaging has evolved and its multi-functional role in promoting tobacco products. The section outlines the origins and elements of tobacco packaging (2.1), discusses packaging's role as part of the wider marketing strategy for a product or brand (2.2), and examines how packaging relates specifically to point of sale and to measures to control this (2.3). Section 2.4 discusses in more detail the various ways in which tobacco packaging is used to communicate with and attract consumers, including the ways in which packaging might detract from warnings and use design techniques to suggest that some products may be less harmful than others.

2.1 Tobacco Packaging and its Origins

Until the mid-19th century, minimal effort was made by tobacco growers and manufacturers to differentiate their products (Congdon-Martin 1992). Most cigarettes were wrapped in sheets of paper twisted or glued at the edges (Mullen 1979), while other early packaging containers for tobacco products, used from the 19th century onwards, included cloth bags, wooden boxes, metal tins, glass bottles, jars and canisters, and cardboard tubs (see Congdon-Martin 1992). This changed when some tobacco manufacturers began to name their products "in the hope of creating product identification and loyalty" (Congdon-Martin 1992, p4). Using hot irons these names were 'branded' onto the wooden caddies and crates used for shipping the tobacco around the world. As a result many named brands soon became available, with the manufacturers faced with the task of creating a distinct identity for each. Packaging, which with the advent of mass consumerism had been transformed by the late 19th century into a "no nonsense tool of persuasion" (Heller 1999, p216), was one way to do this. The development of colour lithography towards the end of the 19th century was a significant milestone, as it meant that paper labels could be replaced with images printed directly onto tin, paper, cloth and glass (Congdon-Martin 1992).

The advent of machine-made cigarettes in the 1880s saw a significant growth in the cigarette market, but even with metal, glass, wood and paper available to package tobacco, before 1900 some cigarettes were still sold by weight. Mullen (1979) explains that 'heavily decorated wooden cabinets displayed a range of loose cigarettes in the tobacconist's shop in sliding drawers behind a glass front, which would be weighed up and tipped into small envelopes' (p11). By the start of the 20th century all cigarettes typically came in packages. Cigarette package testing can be traced back to this time (Thibodeau & Martin 2000).

Cigarette packaging includes not only the container but also coupons, cards, inserts and 'onserts'. Cigarette coupons that could be exchanged for gifts were used inside little cloth sacks of Bull Durham tobacco in the early 1880s in the USA (Goodrum & Dalrymple 1990) and their use continued and spread over the following decades; by 1931 there were a total of 22 coupon schemes in Britain (Mullen 1979). The gifts from these schemes included both novelties and household necessities, such as clothing and razors (Mullen 1979). These coupon schemes continued to be used in the UK until they were no longer permitted by the TAPA.

Plain pieces of card were used inside early tobacco packs to protect the contents. Tobacco companies in the USA then decided to make greater use of these cards, and began to print colourful pictures and advertisements on them (The London Cigarette Card Company 1982). The customary format of the cards, subsequently introduced in Britain in the 1880s, was to feature a picture on the front and an advertisement or check list of subjects on the back. With most smokers at the time being male, the most dominant themes on cards were actresses, beautiful women, sports,

pioneering and politics (The London Cigarette Card Company 1982). The first cards were 'singles' unrelated in subject matter, "but it was not long before enterprising manufacturers hit upon the idea of producing sequences of cards on particular themes, the object being to encourage the smoker to continue buying that particular brand in order to collect all the cards" (The London Cigarette Card Company 1982, p9).

Cigarette cards became very popular in the early 20th century (The London Cigarette Card Company 1982) and were considered a 'national craze' in the UK (Mullen 1979). Although suspended with the onset of the first World War, they quickly regained momentum in the 1920s and 1930s before production was largely discontinued in 1940 (The London Cigarette Card Company 1982), concomitant with the shift towards king-sized and filtered cigarettes (Mullen 1979). The use of these cards in the UK continued sporadically until 2003, when Imperial Tobacco included cigarette cards depicting former Superkings advertising campaigns (The Grocer 2003a). Following a complaint, Bristol Trading Standards Officers, responsible for local enforcement of the TAPA, investigated this matter and ruled that the inserts constituted an advertisement under the TAPA (Marketing Week 2004).

Inserts are a cost-effective way of using the package to convey additional information to the consumer (Selin & Sweanor 1998). In the UK, inserts were used before the TAPA to offer money off future purchases (Off Licence News 2002). Such promotions are no longer permitted, and inserts are instead used to inform customers about packaging redesigns and brand features. Brands such as Mayfair, Richmond and Silk Cut within the last two years have, for example, used inserts to remind consumers that the product has "the same great quality, taste and value" (Moodie & Hastings 2010), or to promote a new tactile finish to the pack. Before pack descriptors such as 'Light' and 'Mild' were prohibited (see 2.4.3 below), inserts were also used by tobacco companies to explain how colour coding would be subsequently used to signify product strength. In countries with pictorial health warnings, such as Brazil and New Zealand, some tobacco companies have included inserts (adhesive pamphlets) the same size as the health warnings, thus allowing smokers to use these to conceal the warning if they choose to do so (Cavalcante 2003, TVNZ 2011).

Another feature of tobacco packaging is the use of 'onserts', which are attached to the outside of packs. For instance, Camel Cash or 'C-notes', which were introduced in the USA in 1991, were designed to look like spoof US currency and could be redeemed for Camel branded items. It has been suggested that the need to collect the substantial number of Camel Cash dollars required to redeem prizes may have created an incentive for consumers to remain loyal or increase consumption (Richards et al 1995).

2.2 The Role of Packaging in Marketing Strategy

Tobacco companies state that the role of tobacco packaging is to guide brand navigation, brand differentiation and inter- and intra-brand competition among adult smokers (Japan Tobacco International 2008). However, textbooks and literature on marketing strategy suggest that packaging has multiple functions beyond allowing consumers to identify, distinguish and select a brand. Packaging is considered a vital instrument in modern marketing activities and one central to any 'integrated' marketing strategy (Ahmed et al 2005, Rundh 2009), particularly for fast moving consumer goods (Simms & Trott 2010). Marketing communications are intended to work in synchronicity to create brand awareness, increase brand appeal, foster positive brand attitudes and perceptions, and maintain and increase market share, with packaging often the end point of these communications. The importance of packaging is reflected in Pilditch's (1961) description of the pack as the "silent salesman". Marketing and retail academics and packaging experts have discussed/shown how the package can heighten product appeal, create positive impressions, make

emotional connections, influence product perceptions and choice within the store , aid purchase decisions and help drive the sale (Sara 1990, Grossman 2006, Schwartz 1971, Silayoi & Speece 2004, Young 2004, Silayoi & Speece 2007, Clement 2007, Wells et al 2007, Elliot 2009, Ogba & Johnson 2010). Section 2.4 illustrates in more detail how packaging elements such as design, colour and shape are used to communicate with and influence consumers.

Advertising and packaging have traditionally worked together (Sara 1990) , with advertising helping to make a brand symbolic and rich in meaning, and this meaning recalled, reinforced and delivered by the package itself (Pollay 1994). In turn, the pack itself has been used as a promotional and advertising vehicle. For instance, in the UK, before the TAPA was introduced, every pack of Royals had a peel-off section featuring a scratch panel which, when scratched, revealed a money-off voucher or a free pack offer (The Grocer 2002). The packaging for a popular Canadian brand, Du Maurier, has been used to advertise a new brand on the Canadian market (Non-Smokers Rights Association 2009).

The TAPA has removed many marketing channels in the UK and has limited the opportunities for packaging and advertising to work in conjunction. However, packaging remains an important marketing tool. Furthermore, with the removal or restriction of other forms of marketing, the pack appears to have assumed greater significance for communicating with customers. An industry journal in 1991 stated that "the role of the cigarette pack as the creator and bearer of an image will be more significant than ever" (Tobacco International 1991, p14). Similarly, in a tobacco industry periodical Eindhoven (1999) states that "it has been argued that manufacturers can lessen the effects of tobacco advertising bans and restrictions by including their products in elegant packs. If a brand can no longer shout from the billboards, let alone from the cinema screen or the pages of a glossy magazine, it can at least court smokers from the retailer's shelf, or from wherever it is placed by those already wed to it" p17).

2.3 Packaging and Point of Sale

After the removal or restriction of other forms of marketing in the UK through the TAPA, point of sale (POS) and packaging were the main forms of promotion available for communicating brand imagery (Slade 1997, Wakefield et al 2002). Articles in the retail press at the time suggested that tobacco companies recognized the importance of the in-store unit or gantry stocked with cigarette pack as a means of communicating with consumers in the absence of other channels: "Gallaher believes that the tobacco gantry's importance as a selling tool will certainly increase when the advertising ban goes ahead" (The Grocer 2002, p4), and "Watkins [*Imperial Tobacco spokesperson*] sees the tobacco unit as the best place to promote the product" (Watts 2003).

POS gantries displaying packages will remain in place until 2015 for smaller businesses in England and Scotland, after which they will be prohibited under the Health Act 2009 in England, Wales and Northern Ireland, and the Tobacco and Primary Medical Services (Scotland) Act 2010 in Scotland. The removal of POS gantries is likely to reduce exposure to packaging among non-smokers within the retail environment. However, packs will continue to be important and visible in other ways. Mizerski (2011) summarises five ways, proposed by various academics, in which packaging will continue to function as a marketing tool:

1. "The present cigarette package acts as an advertisement in a retail store point of sale (POS) display where some element of the package is visible to a store customer.

2. The package makes cigarette use appear ubiquitous and makes potential and new users believe smoking is more 'normal' than it is. The literature is not clear on how plain packaging would change this perception beyond making the imagery of the user less glamorous.
3. The product package is visible to present smokers that want to quit, or have quit smoking, and the exposure to the branded package excites them and gives them 'cravings' for tobacco and the 'urge' to smoke again.
4. The prominent branding used on packs ensures long term loyalty from new users by providing favorable and compelling images they can continue to experience.
5. The present packaging reduces the effectiveness of present health warnings by reducing their potential size and the competition from 'eye-catching' branding logos" (Mizerski 2011, p2-3).

Within the retail environment, even after displays are prohibited, consumers will continue to have some exposure to packaging in stores when tobacco purchases are made and during routine retail duties, such as refilling shelves and stock-taking. Outside the retail environment, packs will continue to function as a marketing tool through their handling and display by smokers. John Digianni, a former cigarette pack designer, has stated that "a cigarette pack is unique because the consumer carries it around with him all day…It's part of a smoker's clothing and when he saunters into a bar and plunks it down, he makes a statement about himself" (Koten 1980). Similarly, a document from Rothmans describes the company as being "very aware that every customer carries the Rothmans logo, on the package, with him or her all the time. That package comes out many times a day, and every time it is seen makes a personal comment about the person who carries and shows it" (Rothmans of Pall Mall Canada Limited 1982, p7). It has been argued that the cigarette pack is typically viewed by the smoker and others many times a day, "on the smoker's person or at least within easy reach twenty-four hours a day" (Mullen 1979, p40), and in the process the smoker adopts some of the brand's personality and identity (Wakefield et al 2002).

2.4 How Packaging Communicates With and Attracts Consumers

The FCTC states in Article 13 that tobacco packs "are used in various ways to attract consumers, promote products, and cultivate and promote brand identity" (WHO 2008b, p6). This section discusses in more detail how different aspects of the pack are used to communicate with and attract consumers. It also discusses how these aspects might potentially detract attention from warnings and use design techniques to suggest that some products are less harmful than others, as suggested in Article 11 (WHO 2008a). Seven themes are discussed: graphical design, structural design, descriptors, colour, sensory packaging, interactive packaging, and other aspects of packaging.

2.4.1 Graphical Design

The use of graphical design on cigarette packs to create a distinct identity for each brand dates back over a century. The American Tobacco Company introduced brightly coloured and instantly recognisable images on the fronts of packs from the late 19th century (Mullen 1979). By the start of the 20th century, the importance of the graphical design of tobacco packaging, which includes image layout, colour combinations and typography (Silayoi & Speece 2007), was apparent across the globe (Mullen 1979). The graphical design of cigarette packs was described as almost an art form (Mullen 1979) by the middle of the 20th century, with commentators suggesting that "cigarette package designs had proven that there were infinite ways to sell a paper-wrapped stick of tobacco" (Thibodeau & Martin 2000, p21).

Distinctive graphics function as a brand identifier, allowing consumers to navigate through the 'clutter' to find their brands (Silayoi & Speece 2004). However, the primary function of graphical design is to make the package aesthetically appealing, so that it stands out and creates a favourable brand image (Silayoi & Speece 2007, Ogba & Johnson 2010). Brand image has been defined as the associations with, or perceptions of, the brand in consumers' minds (Carter 2003),. Tobacco industry documents highlight the importance of carefully planned designs in creating and driving favourable brand imagery (Wakefield et al 2002). As one tobacco industry document states: "In the cigarette category brand image is everything. The brand of cigarettes a person smokes is their identity. Cigarettes tell others who they are as a person" (Rothmans Benson and Hedges 1996, cited in Pollay 2004).

Changes to the graphical design of the pack help to create and drive brand image. Unlike structural innovation, which tends to be most frequent for premium brand cigarettes, changes to pack graphics occur for all brands and all tobacco categories. These changes typically involve some alteration to logos, symbols, colours or fonts, which helps to refresh and modernise the brand (Ford & Moodie in press). Such changes can have a significant impact on sales, as demonstrated by the graphical redesign of the Lambert & Butler range in the UK in November 2004, which increased sales by 60 million pounds (Good 2006).

Design changes are often slight, as designers are keen not to lose too many of the familiar elements which help to give brands their intangible qualities (Thibodeau & Martin 2000). However, one current trend is to release limited-edition packs which may depart considerably from the existing pack graphics. Limited edition packs are intended to generate consumer attention, make the product more attractive (Brinson 2008) and increase the speed of sales. As a Dutch design agency director states, "If you look at the limited-edition packs, you will notice how quickly they all sell out. Because when consumers see an attractive pack, they want it. They want to have the newest thing" (Neuber 2009). Limited edition packs can also become collectibles, for those who value exclusivity, and can have a lasting impact on brand perceptions (see Ford et al in press). Limited edition packs are increasingly being used for tobacco products in the UK, with the retail press suggesting that at least 14 limited edition packs have been released in the UK between 2009 and 2010, compared with only one between 2002 and 2003 (Ford & Moodie in press).

2.4.2 Structural Design

Changing the structural design of packaging – for example, its shape or opening method - can be complex, technically challenging, time consuming and costly (van de Laar & van den BergWeitzel 2003), but structural innovation can help differentiate products, aid recognition and stimulate interest. Structural innovation is considered a means of adding value, creating appeal and driving sales, and has been considered 'the primary driving factor in revitalizing brands and entire product categories' (Young 2004, p68).

An early example of structural innovation was Marlboro's departure in the 1950s from the conventional soft pack of the time to a flip-top box (Thibodeau & Martin 2000). This design remains in wide use, although in recent years further innovations in method of opening have been researched and introduced. For example, several consumer tests have been conducted of slide pack, which are pushed open from the side. A slide pack for Dakota, a brand for RJ Reynolds, was described as more likely than a branded pack to be perceived as unique, contemporary, attractive, fun, and a pack that customers would feel comfortable carrying (RJ Reynolds 1990). However, another industry study suggested that slide packs were seen as a novelty item at best, and may not function as well as soft and flip-top packs (Tektronix 1995).

A review (Moodie & Hastings 2011) of the tobacco retail press from 2002 to 2008, which covers the period before and after the introduction of the TAPA, found that changes to the structural design of tobacco packaging, in terms of method of opening and shape, appeared to be more prevalent towards the end of this period, when most other forms of marketing had been prohibited. In the period from January 2009 to June 2011, mentions of structural innovation within the retail press were more prevalent than in the seven year period between 2002 and 2008 (see Ford & Moodie in press). This suggests that there has been an increased focus on structural packaging innovation by tobacco companies since the TAPA, and particularly within the last few years. One of the first examples of pack innovation after the introduction of TAPA was the 2006 Benson and Hedges (B&H) Silver slide pack from Gallaher. The introduction of the new pack was accompanied by an increase in sales of almost 75 million pounds in 2007 (The Grocer 2007a), reported to be the biggest growth of any of the top 20 cigarette brands in this year (The Grocer 2007b). A spokesperson for the company attributed the sales growth to the novel packaging (Moodie & Hastings 2010). In 2011, the company Japan Tobacco International (JTI) started selling B&H Silver in both slide and traditional flip-top packs, and reported that "the slide pack had outsold the traditional flip-top box where Silver had been available in both formats at the same price" (The Grocer 2011a). As the brand name appearance and price were similar for the two different pack formats, the main factor explaining the difference in sales appears to have been the pack design. Another example is the Philip Morris Marlboro Filter Plus slide-up pack, in which the top half of the pack slides up and back: this achieved a 2.5% market share in Romania in the first quarter of 2009 (Camilleri 2009).

A recent pack innovation is that of the '*wallet'* (also called the '*book'* or '*split'*) pack. British American Tobacco (BAT) introduced wallet packs for Kent cigarettes in 2008 in Russia. The Russian Tobacco Media Group (2008) states that the pack is divided into two sections and opens like a wallet, thereby doubling the surface area of the pack and providing additional space for communication with consumers. A sales director for Gestel Printing Company similarly describes how recent trends in packaging and printing have been to "create and use more space for communication with the consumer to compensate for the loss of advertising possibilities for tobacco products" (Brinson 2008). As an example of how this additional communication space is used, a Kent wallet pack introduced in Chile in 2007 displayed a phone number on the inside of the pack which, when called, led to an invitation to a series of 'secret' parties at summer hot spots in Chile (ASH UK 2007). A wallet pack for the Dunhill brand was introduced in Australia in 2006, but was subsequently withdrawn from the market because one of the pack halves did not carry the required pictorial warnings and thereby breached labelling laws (Freeman et al 2008). This same pack was subsequently introduced the UK in 2008, with two differences: 1) it did not have a perforated line in the middle of the pack that allowed it to be split into two, and 2) when opened it did not display any health warnings on the inside of the pack. Investment in installing the necessary equipment to enable this pack alteration in Russia totalled 3.5 million US dollars (Russian Tobacco Media Group 2008); the amount illustrates the high value the company placed on having the additional communication space.

Other recent innovative methods of opening include the Marlboro Bright Leaf '*lighter*' pack, which opens like a zippo lighter; the Lambert & Butler Silver '*side-flip*' pack, which opens like a slide pack but in a rotating fashion; the Silk Cut '*V*' pack' which opens with a V-shaped lid; and the Lambert & Butler Silver '*GlideTec*' pack, which opens via sliding a section on the front panel. The Chief Executive of Imperial Tobacco Alison Cooper described the patented GlideTec pack as creating "a wow factor", with the consumer research "some of the most positive we have ever seen" (Cooper 2011). The pack allows the smoker to offer a cigarette with a one-hand motion, to embrace the 'sociability of smoking'. Cooper stated that since its launch in selected accounts in the UK since April 2011, the results have been "tremendous" (Cooper 2011).

Pack shape can assist with consumer recognition, reinforce branding and make products more appealing (van de Laar & van den BergWeitzel 2003, Silayoi & Speece 2004), especially in cluttered marketplaces where products need to differentiate themselves (Heller 1999). Recent innovation has led to some novel cigarette pack shapes for a number of existing and new brands or brand variants. One UK trend since 2008 has been towards narrower and thinner packs, called slims, demi-slims, super-slims and compact king-sized packs, which sometimes contain slightly thinner cigarettes (Carpenter et al 2005). Super-slims products are now available in the UK for four cigarette brands (Silk Cut, Vogue, Allure, Richmond). The increasing use of these novel pack shapes may be to stimulate interest through innovation, allow shelf standout, and facilitate inter- and intra-brand differentiation, or increase brand lines.

Industry documents suggest that slimmer packs are predominantly targeted at young women (Toll & Ling 2005, Carpenter et al 2005) and are designed to appeal to women as fashion statements (Lambat 2007). A new line of super-slims cigarettes called 'Sweet Dreams' was recently withdrawn in Russia by manufacturer Donskoy Tabak in response to criticism that it was aimed at teenage girls (Miller 2011). Imperial Tobacco (2011) recently reported strong growth in the super-slims market in Eastern Europe, with Belarusian based tobacco company Neman, in conjunction with JTI, implementing a new production line for super-slims products in summer 2011. The cost of the technical equipment for this production line was reported to be over 5 million euros (Neman 2011). Prior to this, between 2008 and 2010, three production lines valued at over 16 million euros were installed in the factory for producing compact king-size and super-slims formats in octagonal and round corner packs (Mitreva 2011). Some of these smaller 'purse' packs have proved successful to date in the UK, with growing market share (see Ford & Moodie in press).

2.4.3 Packaging and Product Strength and Harm

The pack has been used for many years as a vehicle for communicating messages about strength and harm. For instance, the rear panel of a Chesterfield pack from the US in the 1950s displayed the information: "For a full year now, a medical specialist has given a group of Chesterfield smokers thorough examinations every two months. He reports no adverse effects to their nose, throat or sinuses from smoking Chesterfields" (Mullen 1979, p57). Similarly, a pack of Giraffe cigarettes from Malaysia from around the same time stated on the rear panel that "The pure tobacco is then performed (sic) by special process, for these reasons the cigarettes are absolutely harmless to the throat" (Mullen 1979, p53). Other packs adopted a different tack to imply less harm; for example, a pack of Trim cigarettes from 1960 claimed to be 'clinically tested' (Thibodeau & Martin 2000).

Concerns about the health risks of smoking prompted the introduction of 'low tar' and 'mild' cigarettes in the 1960s and 1970s (Peace et al 2007), which were developed and promoted with an implied reduction in health consequences (Hurt & Robertson 1998). Descriptors on packaging such as 'low tar' and 'light' were used to signify lower tar and nicotine delivery in comparison to branded cigarettes, as measured by a standardised smoking machine test developed at this time. Subsequently it was found that machine tests did not accurately replicate human patterns of smoking, and that such products did not deliver the claimed lower levels of tar and nicotine (Gallopel-Morvan et al 2011). Several research studies suggested that consumers were misled by descriptors such as 'light' and 'mild' and may consequently have underestimate the health risks associated with smoking (Kozlowski et al 2000, Shiffman et al 2001, Borland et al 2004, Cummings et al 2004, Wilson et al 2009). Since October 2003, no legally manufactured tobacco products within the UK have been allowed to use descriptors such as 'low tar', 'light', 'ultra-light' or 'mild', which were prohibited in the EU in accordance with the current Tobacco Products Directive, and no longer permitted in a total of 89 countries (WHO 2011).

Following the prohibition of these kinds of descriptors, replacement descriptors were adopted by some brands. For instance, Camel Lights and Ultra-lights became Camel Smooth and Refined, respectively (The Grocer 2003b). It has been suggested that these replacement descriptor terms may have a similar misleading effect on consumer understanding of the relative harms of smoking these products (Hammond & Parkinson 2009, Mutti et al 2011).

Other descriptors which appear on packs include claims, such as on the American Spirit brand, that the tobacco is 'additive free' and 'natural' (Thibodeau & Martin 2000). The pack also features an image of a Native American, a symbol of 'unspoiled' America, to emphasise the use of pure tobacco, unsullied by chemicals (Thibodeau & Martin 2000).

Colour coding is commonly used for consumer goods to make it easier for consumers to process information quickly (Silayoi & Speece 2004), and it helps differentiate brand variants. For tobacco products, it has been suggested that colour is also used to communicate product strength and harm (Cavalcante 2003). Industry documents reveal that the use of lighter pack colours and shades to communicate reduced harm has been researched extensively by manufacturers (Philip Morris 1990, The Research Business 1996, Pollay & Dewhirst 2001, Wakefield et al 2002). Certainly, pack colour could be used to convey reduced harm via 'sensation transference', a concept first suggested in the 1930s (Recker & Kathman 2001), where consumers fail to distinguish between the product and the package but instead transfer feelings about the package, including the colour, to the product itself. This has been demonstrated for a wide range of consumer goods and is widely accepted within the marketing literature (Banks 1950, Brown 1958, McDaniel & Baker 1977, Schlackman & Chittenden 1986, Sara 1990, Hawkes 2010).

Tobacco companies have also responded by using numbering systems or colour coding. As an example, in the UK Lambert & Butler Lights became Lambert & Butler Gold and Superkings Lights became Superkings Blue (Curtis 2003, Devlin et al 2003). Finally, pack shape has been used in conjunction with colour to convey particular messages to consumer. Section 2.4.2 describes how narrow and thin cigarette packs have recently been introduced on the UK market. Most of these packs in the UK and elsewhere feature a clean-looking package design, used to reflect purity (Thibodeau & Martin 2000), lighter ('healthier') colours such as white, green, pink and purple, and often include flower imagery, symbolic of nature.

2.4.4 Packaging with Sensory Appeal

Another recent innovation for cigarette packaging in the UK is the use of texturing or lacquering on packs to create a **tactile sensation**. Touch provides an important means of developing an emotional or affective connection with the product or package, particularly those that are handled frequently (Spence & Gallace 2011). As smokers interact by touch with their packs many times a day, the use of tactile packaging is well suited to tobacco products. Customers are generally unable to touch tobacco packs within the retail environment, which prevents them from benefitting from the full sensory experience. As packaging company Vaasen explain, although the brand experience begins in-store when consumers see the packs displayed, "the real experience begins when they are holding the pack in their hands" (Vaassen 2011, p115).

A spokesperson for packaging company Huber group states that 'haptic-effect' coatings, which create a tactile sensation when touched, are growing in popularity among packagers (Mapother 2011a). In 2007 it was reported that approximately a third of the world's largest brands were developing 'sensory branding' strategies (Johnson 2007). The first example of tactile packaging in the UK after TAPA was the Silk Cut 'touch' pack with a textured feel, introduced by JTI in 2010 (Walker

2011a). These packs are now available in several European countries, and Philip Morris launched tactile packaging for two brands in 2011 (Philip Morris 2011a, Philip Morris 2011b). As technological developments mean that it is now quicker and less expensive to produce tactile designs, this is likely to create further opportunities for innovative branding and packaging (Spence & Gallace 2011).

Fragranced packaging has existed for over a hundred years. At the start of the 20th century the Imperial Tobacco Company in the UK had female-oriented brands such as Musk Rose, with flowers on the pack and perfumed cigarettes inside. Mullen (1979) explains that the use of roses, even by association, was intended to breathe fragrance over the pack. Recent years has seen revived interest in the potential of scented packaging. For instance, the packaging for female-oriented brand Virginia Slims Uno Fresh, marketed by Philip Morris in Russia in 2009, was reported to have a flowery aroma meant to complement the smell of a woman's hair and clothes (Anon 2011). Industry documents suggest that scented cigarettes help to address female sensitivity to unpleasant odour (Carpenter et al 2005) and are instantly connected to emotions, mood and memory, which can subconsciously affect purchase decisions (Kaplan & Zarrilli 2005).

The potential of hearing, a seemingly extraneous sense in respect to tobacco packaging, has also been explored. For instance, there is a distinctive 'click' heard when closing the Marlboro Bright Leaf 'lighter' pack or the Lucky Strike 'click' pack. Whether this type of packaging will appeal to consumers of tobacco products is unclear but sounds made by a food item's packaging can, and often does, provide meaningful information (Spence & Gallace 2011), and auditory cues are thought to play a significant role in modulating the perception and evaluation of foodstuffs, even though consumers are often unaware of the influence of such auditory cues (Zampini & Spence 2004).

Some of these previous examples are designed to appeal to more than one sense but the impact of this multi-sensory appeal, at least for tobacco products, is not yet known given their recent introduction to the UK and other markets.

2.4.5 Interactive Packaging

An even more recent innovation in the packaging field is '*interactive*' packaging. An example of interactive packaging is Ronhill Unlimited, which Croatian based tobacco company TDR, owner of the Ronhill brand, has described as the first interactive cigarette packaging in the world (Packaging Europe 2011). The pack has a Quick Response (QR) bar code, which is a two-dimensional code consisting of black modules arranged in a square pattern on a white background that is readable by smart phones (and QR barcode readers), incorporated into the pack design. When the QR code on the reverse panel of the pack is scanned with a mobile phone that has the technology to enable this, the information encoded may provide the user with text, images or a link to a web address. When a user of the Ronhill Unlimited pack scans the QR code with a mobile phone, it directs them to a regional mobile web page where they can find information about the nearest place where smoking is permitted, which it does by using a map that shows their current location (Packaging Europe 2011). This particular link follows smoke-free legislation in Croatia, which limits opportunities to smoke indoors in public places. The user of the Ronhill Unlimited pack can also add new locations where smoking is permitted. QR codes can be used to link to a wide variety of types of information, opening up new possibilities for tobacco and other consumer goods companies for communicating with consumers.

2.4.6 Other Means of Communicating With and Attracting Consumers

Packaging can also be used to communicate value for money, to appeal to cost-conscious consumers. Value can be communicated to consumers via the packaging in two main ways: 1) variations in pack size and 2) the use of price-marking (Moodie & Hastings 2011). Variations in pack size, such as packs containing 14, 19 or 24 cigarettes rather than the traditional 10 or 20, allow consumers to select the quantity most convenient for them (Simms & Trott 2010), and at the price most affordable to them. For example, 14-pack formats, which were introduced to the UK market in 2006 and again in 2010 (Moodie & Hastings 2011), were designed to create the impression of better value for money and to discourage smokers from 'down-trading' (switching to a cheaper brand) (Forecourt Trader 2006, Walker 2011a).

Price marking on packs has become more common for many consumer goods, including tobacco products, in recent years (Walker 2011b). Price marking appears to spur increased sales for a range of products; a trade communications manager for Cadbury has been quotes as saying "Pricemarked packs are used to make products sell faster in store" (Britton 2011). When price-marked Sterling packs were introduced at the end of 2008, market share increased from 5% to 6.1% in just over 4 months (Walker 2009). The use of cigarette pack price marking in the UK was typically restricted to economy brands (Moodie & Hastings 2011) but can now also be increasingly found on standard-priced and premium brands and new brand offerings (Ford & Moodie in press).

Finally, packaging can also be used to communicate messages about a company's concern for the environment (Packaging Digest 2003). With environmental concerns high among consumers (Finco et al 2010), the use of more environmentally friendly materials or manufacturing processes may have benefits not only for the environment but also for a company's reputation, as the use of such packaging can help portray companies as responsible corporate citizens (Ford et al in press). As an example of the use of green packaging for tobacco products, a popular Canadian brand of cigarettes informs, via the pack, that '*we have replaced our aluminium foil with paper. It keeps the product just as fresh and is now kinder to the environment. Small steps make the difference*' (Moodie & Ford 2011). Similarly, in the UK Lucky Strike cigarette packs are now certified by responsible forest management assurance schemes, and have the scheme logo clearly marked on their packaging (Ford et al in press).

2.5 Summary

This contextual section has described the different elements of tobacco packaging and discussed the role that packaging plays as part of a brand's overall marketing strategy. It has shown that packaging has increased in importance as a marketing tool for tobacco companies with the restriction or prohibition of other forms of promotion. It has outlined how pack elements such as graphical design, structural design, descriptors, colour, sensory appeal, interactivity and appeals on the basis of value and environmental concern are used to communicate with and appeal to consumers, as well as to potentially convey misleading impressions about the relative harm of different cigarette products.

3 METHODS

This chapter outlines the methods used in the review. It begins by setting out the research questions (3.1) that the review aimed to address. It then describes the stages of the review: defining relevant studies (3.2). searching (3.3), screening (3.4), quality assessment (including data extraction) (3.5) and synthesis (3.6).

3.1 Review Questions

The review questions were:

1. What effect, if any, does plain packaging have on:
    - the appeal of packaging or product;
    - the salience and effectiveness of health warnings;
    - perceptions of product strength and harm?

2. Are there any other potential benefits of plain packaging not identified by the FCTC, or any disbenefits to plain packaging, and what are these?

3. How do effects for all the above vary by gender, age, socio-economic status and ethnicity?

4. What are the facilitators and barriers to plain packaging having an impact?

Review question 1 is predicated upon the proposed benefits of plain packaging according to the FCTC, as outlined in the previous section. Review question 2 examines other possible impacts of plain packaging, such as impacts on beliefs and intentions regarding smoking in general. Review question 3 examines differences by key population sub-groups for smoking risk and harm. Finally, review question 4 examines any evidence, reported within the included studies, about the factors which may assist, reduce or impede the introduction of plain packaging. It was anticipated that these could include aspects of the policy and economic environment; public, policymaker and stakeholder understanding of and attitudes towards plain packaging as a policy measure; industry and retailer responses; and the presence or absence of related policies and interventions (for example, larger health warnings, legislation on point of sale display).

3.2 Defining Relevant Studies

To be included in the review, studies had to meet these criteria:

1. from or after 1980
2. about human populations
3. about tobacco
4. about packaging
5. primary research.

The review aimed to be comprehensive and to include all studies that had been conducted on the plain packaging of tobacco products. Therefore we set a cut-off date of 1980 as the first study in this area was published in 1987 (Trachtenberg 1987). We stipulated that the studies should be primary research but did not put limits on study design. Some systematic reviews include only randomised

controlled trials of interventions, but we were aware that this type of evidence cannot exist for plain packaging as plain packaging has not yet been implemented in any jurisdiction. We therefore looked at all feasible study designs. This resulted in four types of study being included in the final group: cross-sectional surveys, qualitative studies, mixed methods studies combining survey and qualitative approaches, and interventions testing the impact of plain packs on individuals and retailers. We did not limit our search to English papers, again to be as comprehensive as possible. This resulted in some relevant papers in French being identified and these were translated. We also included unpublished material as we wanted to be able to examine findings from recent research. As a result there were eight studies that were at the review stage of the publishing process that were included. We were also made aware at the search stage of several ongoing and recent studies on plain packaging which have not yet been fully analysed or for which permission for inclusion could not be obtained; these have not been included in the review. A table describing characteristics of these studies is available in Appendix 5. A cut-off date of the 31st August 2011 was set for receipt of full text papers for screening.

3.3 Search Strategy

We searched 21 electronic databases from the fields of health, public health, social science and social care (see Appendix 1). For the databases, a comprehensive search strategy was developed and tested using indexing and free-text terms in PubMed (see Appendix 2). This was then adapted to other databases. Additionally, researchers at Stirling University conducted some text mining on key texts, using TerMine™ software, to help build terms for the searches.

We also searched a number of websites, Google Scholar and the tobacco industry's legacy library (Legacy Tobacco Documents Library), see Appendix 1 and searched for further studies through citation chasing. Personal contact was made by a researcher at Stirling University with: academics and market research groups known to have conducted research on plain packaging, either currently or in the past; academics involved in research concerning tobacco packaging, although not specifically plain packaging; and non-governmental organisations that have written on the topic of plain packaging. Data or reports were not directly requested from the tobacco industry as the search strategy was intended to pick up any publicly available reports from the industry. In addition, other data on packaging held by the industry was likely to be commercially sensitive and would be unlikely to be released to the researchers. A total of 50 emails were sent requesting information on any plain packaging research that individuals were aware of or involved in; the message also included a cut-off date and a request to forward the email on to others who may be able to assist. Contact was also made with individuals collating plain packaging research within the European Commission and the Australian Government Department of Health and Ageing. Studies were managed by EPPI-Reviewer 4.0, the EPPI-Centre's online review software (Thomas et al 2010).

3.4 Screening of Studies

The searches yielded 4,518 citations. After stripping out duplicates, 3,401 title and abstract records were screened for initial topic relevance, resulting in 169 papers being identified for retrieval and full text screening. These full text papers were screened against the list of inclusion criteria 1-5 (see Section 3.2 above) by two researchers at the EPPI-Centre, who included 41 studies for data extraction and quality assessment. The quality assessment, described below, was used as an additional inclusion screening criterion for papers. A chart in Appendix 3 shows the flow of included studies through the review process.

All 41 studies were coded using the standard classification system (Peersman et al 1997) and further codes were added to capture information specific to this review. The review coding tool was developed by the EPPI-Centre in consultation with the team at Stirling. Two researchers extracted data on each paper, one from the EPPI-Centre (KH or IK) and one from Stirling University (KA, RP or SB), and agreed a final version.

We extracted data on: study aims and design (aims and impacts, funding, design, country and date of publication); the sample studied (sample size, age, gender, smoking status, ethnicity, and socioeconomic status); sampling strategy, recruitment and consent processes; data collection and analysis (description of plain and branded packs, methods of data collection, methods of analysis); and findings (impacts on knowledge, attitudes and behaviour; views on policies to introduce plain packaging; benefits and harms, and facilitators and barriers to introducing plain packaging).

3.5 Quality Assessment of the Studies

Each of the 41 studies was appraised for quality and relevance. Three different quality tools were used, depending on the type of study being assessed. The assessment was completed by the two reviewers who carried out the data extraction. The quality scoring was agreed by the two reviewers as part of the data extraction process.

(i) **Survey studies** were assessed using six quality criteria informed by those proposed for assessing the quality of epidemiological or correlational research as described by Wong and colleagues (2008), and by principles of good practice for critical appraisal of primary research (Centre for Reviews and Dissemination 2009). The six quality criteria covered three main domains relating to sampling, data collection and data analysis. Each study was assessed according to whether:

- methods for sampling the population under study were appropriate;
- reliable and valid measurement tools were used for independent and dependent variables;
- the response rate was reported;
- investigator(s) controlled for confounding variables when analysing associations;
- reviewers had concerns about the statistical methods used;
- the length of follow-up in longitudinal studies was appropriate, where applicable.

The category of survey studies included some that had an experimental design (i.e. where there were between group comparisons in the survey) as well as those examining opinions across a single sample. A seven points ratings system was used (see Appendix 4). Studies were required to meet all seven criteria to score a high quality rating, meet four to six criteria to be rated as medium quality and meet zero to three criteria to rated as low quality.

(ii) **Qualitative studies** were assessed using criteria developed and used in previous EPPI-Centre reviews (Rees et al 2009) and informed by principles of good practice for conducting social research with the public (Harden et al 2004). Each study was considered according to whether:

- steps were taken to strengthen sampling rigour;
- steps were taken to strengthen data collection rigour;
- steps were taken to strengthen the rigour of data analysis;
- study findings were grounded in/supported by data;
- the breadth and depth of findings were appropriate for the review;
- participants' perspectives / experiences were privileged.

For each of the six criteria, studies were rated between zero and 3 points, and the ratings were summed (see Appendix 4). Studies were required to score 17 or 18 points for a high quality rating, between nine and 16 to be rated as medium quality and zero to eight to be rated as low quality.

(iii) The quality of the **intervention studies** was assessed using a set of criteria devised by the EPPI-Centre in consultation with a statistician (Shepherd et al 2003). The criteria are designed to assess key biases to the results of trials, based on empirical methodological research, and were used in a previous published systematic review (Shepherd et al 2010). To meet the rating of high trustworthiness, the studies had to meet these three criteria:

1. Selection bias
   Studies needed to have either i) allocated participants using an acceptable method of randomisation OR ii) reported baseline values of major prognostic factors for each group for virtually all participants as allocated AND ensured baseline values of major prognostic factors between groups were balanced in the trial OR adjusted for imbalances in the analysis

2. Attrition bias
   Studies needed to i) report their attrition separately according to allocation group, AND have an attrition rate of less than 10% across groups (if they differed) and less than 30% overall OR if the baseline values of major prognostic factors were balanced between groups for all those remaining in the study for analysis.

3. Outcome reporting bias
   Studies needed to report all the outcomes they intended to measure as described in the aims of the study.

The overall relevance of each study was assessed by considering its aims, sample, methods for data collection and analysis and findings relative to our review's aims. Study relevance was rated as high, medium and low.

As a result of data extraction and the quality assessment process, two studies were excluded as the data were considered to be of low quality for the purpose of this review (Trachtenberg 1987, Freeman 2011) and two studies because analysis was incomplete (Hammond 2011c, Hammond 2011d). Thus the review included 37 studies (with results and methodologies reported in 49 papers). A complete list of the included studies is in the References (Section 6.1).

3.6 Synthesis

In order to structure the findings, a framework was constructed that encompassed the range of impacts measured. As Table 3.1 shows, the number of studies within each section of the framework ranged between three (knowledge) and 25 (perceived attractiveness of the packaging and product).

Table 3.1: Number of studies for each measured impact

Which impacts were measured?	No. of Studies
Attractiveness of packaging and the product	25
Attitudes, beliefs or feelings towards the packaging or product	22
Salience of health warnings	21
Knowledge, attitudes, beliefs or feelings towards the brand	16
Perceptions of product strength and harm	13
Attitudes, beliefs or feelings towards smoking	10
Smoking related intentions	12
Pack preferences	9
Support for plain packaging	9
Other	5
Knowledge of tobacco harms, constituents, ingredients	3

Following this analysis, the above impacts were organised into five overarching themes under which findings are summarised narratively:

- Impact of plain packs on appeal (Attractiveness of packaging and the product; Attitudes, beliefs or feelings towards the packaging or product; Knowledge, attitudes beliefs or feelings towards the brand; Pack preferences).
- Impact of plain packs on the salience and effectiveness of health warnings (Salience of health warnings).
- Impact of plain packs on perceptions of product strength and harm (Perceptions of products strength and harm; and Knowledge of tobacco harms, constituents, ingredients).
- Impact of plain packs on smoking-related attitudes, beliefs, intentions and behaviour (Attitudes, beliefs or feelings towards smoking; and Smoking related intentions).
- Facilitators and barriers to plain packaging having an impact (Support for plain packaging; and other).

Within each of the first four themes, impact on particular sub-groups of the population, where they are analysed by the studies, are described. The final theme describes the studies that tested public support for plain packaging and any benefits or harms that respondents identified.

The type of synthesis described above is known as a narrative synthesis (or “thematic summary”). The possibility of combining the studies statistically in a meta-analysis was explored. Given the diversity of research questions addressed in the included studies, most of which vary on at least four dimensions (typically populations, interventions, comparators, and outcomes), it is not appropriate to conduct a quantitative synthesis of these studies. In other words, there was too much heterogeneity. A formal framework analysis was also considered to be an inappropriate method as studies were reasonably homogenous in terms of their conceptual framework.

In narrative syntheses such as the one presented here, reviewers need to be wary of “vote counting” statistically significant results. Such an approach takes no account of the relative size of studies, their methodological quality or the magnitude of their effects (Cooper & Rosenthal 1980). In order to avoid potential vote counting approaches, we adopted two approaches:

1. Indicate the direction of effects in the text and produce tables of direction of effects at the start of each section of the report to summarise the evidence.

2. Report effect sizes, which are statistical measures that indicate magnitude, direction, and statistical significance of the effects.

The first approach is quite straightforward and is evident throughout the report. We have placed the directions of effect tables before results from the quantitative studies, in four of the sections: appeal (4.2), salience of health warnings (4.3), perceptions of product harm and strength (4.4), and smoking related attitudes, beliefs and behaviour (4.5). The second approach was more complicated, and our approach is described below.

Unfortunately, very few studies reported effect sizes for their findings (the exceptions are Hammond 2011b and White 2011). Instead, the studies typically reported descriptive data (usually frequencies) or represented findings only using text descriptions. This meant that we needed to calculate effect sizes based on the data available in the studies. This was complicated because the number of effect sizes that could possibly be calculated for each study tended to be very large, as results are reported within the same study for different combinations of the four dimensions:

- population sub-groups (eg. gender, age);
- interventions (eg. plain white pack with text health warning, plain grey pack without health warning, plain brown pack with graphical health warning, different font sizes);
- comparators (ie. plain versus branded packs, different types of plain packs, and no comparator); and
- outcomes (eg. recall, taste).

As such, it was not practicable to calculate effect sizes for every possible breakdown of findings from each study. It was decided that the calculation of effect sizes should focus on the research questions of particular interest to this review's audience.

Two types of subgroups were identified as being of particular interest: **smoking status** and **age groups**. These were selected for two reasons. Firstly, of all the subgroups, these two were reported in the most studies. Secondly, in terms of tobacco control, differences between these groups are particularly important as they can provide insights into likely impacts on smoking uptake (for non-smokers and young people) and cessation (for smokers). Further, evidence suggests that young smokers may be disproportionately affected by the health risks as they are likely to continue smoking as adults, and are more likely to become heavy smokers; two thirds of adult smokers in the UK started before the age of 16 (The NHS Information Centre 2011).

We focused on two broad groups of outcomes: **appeal/attractiveness** and **perceived behavioural effects** (eg. motivation to quit, deterring uptake). Attractiveness was the most commonly reported outcome group, so we were most likely to find calculable data in the text, and the results from the perceived behavioural effects are intended to inform tobacco strategies to reduce smoking in adults and children, as set out in *A Smokefree Future* (HM Government 2010)

In calculating the effect sizes, we focused on the subgroup differences on ratings on the outcomes of interest for plain packs only (ie. not comparisons with branded cigarettes or other types of plain packs). This decision was driven by the 2x2 structure of effect size calculation (for odds ratios), the lack of independence in the data given that the same person typically rated both comparators, and conceptual consistency in interpreting effect sizes across studies.

The 'plainest' package option in each study was used as the basis of the calculation. In summary, of the four dimensions described above, our focus was on:

- population sub-groups: smoking status or age;
- 'interventions': the plainest pack, typically plain white pack with text health warning;
- comparators: no comparator; and
- outcomes : attractiveness/appeal or perceived behavioural effects.

As indicated above, many studies reported insufficient data to calculate effect sizes for the research questions of interest. The type of data available in each study varied; the most common types of data were frequencies or proportions (eg. proportion of participants rating the plain package as 'unattractive') and consequently most of the effect sizes are odds ratios. Odds ratios are calculated as

$$OR = \frac{ad}{bc}$$

where *OR* = odds ratio effect size, and *a, b, c,* and *d* are the frequencies of observations as defined in the following 2x2 contingency table:

	Agree with statement	Disagree with statement
Group A	*a*	*b*
Group B	*c*	*d*

and where the Groups A and B represent the different subgroups (eg. smokers and non-smokers, children and adults).

One study (Germain 2010) reported means and standard deviations of a 5-point scale, so the standardised mean difference (*d*) was calculated for that study using

$$d = \frac{\overline{X}_{G1} - \overline{X}_{G2}}{SD_{pooled}}$$

where *d* is the standardised mean difference effect size, $\bar{X}_{G1}$ and $\bar{X}_{G2}$ are the means of the outcome scores for group 1 and group 2, respectively, and SD_{pooled} is the pooled standard deviation (square root of the pooled within-groups variances).

In most cases, frequency data had to be derived from data reported in the study (eg. by combining across subgroups that were not of interest such as gender groups, to get the frequency across all people for the actual group of interest). As such, almost all effect sizes involved some derivation from the original studies and some might not reflect conclusions actually drawn by the original study authors. All effect sizes were calculated using the Campbell Collaboration effect size calculator available online at http://www.campbellcollaboration.org/resources/effect_size_input.php.

4 FINDINGS

This section begins with an overview of the characteristics of the 37 studies included in the review (4.1). Findings are then presented for each of the main themes in turn: *Appeal of cigarettes, packs and brands* (4.2), *Salience of health warnings* (4.3), *Perceptions of product harm and strength* (4.4), *Smoking-related attitudes, beliefs, intentions and behaviour* (4.5), and *Facilitators and barriers to the introduction of plain packaging* (4.6).

Sections 4.2 to 4.5 all follow the same structure, beginning first of all with an overview of the studies which addressed the outcome and a Direction of Effects table summarising the overall pattern of findings. Findings are then reported for quantitative studies and for qualitative studies in turn. Finally, analyses of sub-group differences are reported by smoking status, age and gender, and other variables. Section 4.6 adopts a thematic structure, reporting sub-group differences where relevant within each thematic section.

As described in Section 3.6 above, only two of the studies reported effect sizes, and these are reported in the review where relevant. In addition, the review authors calculated effect sizes for studies where data were available for one of two broad groups of outcomes (**appeal/attractiveness** or **perceived behavioural effects**) *and* one of two subgroups (**smoking status** or **age groups**). Not all studies reported sufficient data to calculate an effect size for these outcomes and subgroups.

4.1 Characteristics of Included Studies

Table 4.1 summarises the study aims, design, the study population, the description of the plain packs used in the study, the nature of the comparison in the study (ie. plain versus branded), types of findings and the study relevance/quality. Relevance and quality ratings were determined during the quality appraisal process and resulted in the identification of 6 high quality studies and 31 medium quality studies with none of the studies in the review rated as low quality.

There were 37 studies included and data extracted. Twenty-three of these were surveys (some of which had an experimental element to their design – i.e. included between group comparisons) eight were qualitative studies and two were intervention studies. Four were mixed methods studies with quantitative and qualitative components. The majority (n=15) of the studies were written in 2011, and eight were unpublished manuscripts at the time of inclusion in the review.

Most of the studies were conducted in Australasia (Australia n=10, New Zealand n=5), with six carried out in Canada and four in the United States. Six were run in the UK, five in France and one in Belgium. One study was from Brazil. The sample sizes range from 14,270 (Bondy 1996, a national survey) to 20 (CNCT 2008b, a small qualitative study). Sixteen of the studies focus on young people, and eight include smokers only. Under the thematic groupings of the findings, 28 studies examine the impact of plain packaging upon appeal, 12 the impact of plain packaging on the salience of health warnings, 16 the impact of plain packaging on perceptions of product harm and strength, 16 the perceived impact of plain packaging on smoking-related attitudes, beliefs, intentions and behaviour, and 12 facilitators and barriers to the introduction of plain packaging.

Table 4.1: Characteristics of included studies (n=37)

	Study	Aims	Design/ Data collection methods	Population	Description of plain pack	Nature of comparison: branded pack and plain pack	Types of findings	Study Relevance/ Quality (score)
Quantitative (n=23)								
1	**Bansal-Travers 2011**	To examine the impact of cigarette pack design, product descriptors, and health warnings on risk perception and brand appeal	Survey Interview method	**Location:** US **Sample size:** 397 **Age:** 18-55+ years **Gender:** mixed **Smoking status:** mixed **Sample type:** convenience sample	Plain white, name of brand in plain text and number of cigarettes in box. No health warning or descriptors.	Background colours	Appeal Harm	**Rel:** Medium **Qual:** Medium
2	**Beede 1990**	To investigate adolescents' attitudes toward cigarette brands and 'plain packs' proposal and its impact on smoking behaviour	Survey Interview method Focus groups	**Location:** New Zealand **Sample size:** 567 **Age:** 12-14 years **Gender:** mixed **Smoking status:** mixed **Sample type:** convenience sample	White background with black printing - individual brand names are retained. Size, type face styles, health warnings, pack size and tar and nicotine contents consistent across all packs	Background colours	Warnings Facilitators & barriers	**Rel:** High **Qual:** Medium
3	**Bondy 1996**	To investigate smoking attitudes, knowledge and behaviours among youth	Survey Questionnaires	**Location:** New Zealand **Sample size:** 14,270 **Age:** 10-19 years **Gender:** mixed **Smoking status:** unclear **Sample type:** national representative sample	'Generically packaged cigarettes' in uniform colour (no details)	Background colours Graphic health warning	Appeal	**Rel:** Low **Qual:** High

4	**Centre for Behavioural Research in Cancer 1992a**	To investigate support for pack changes and standard packaging for cigarette packs	Survey Interview method	**Location:** Australia **Sample size:** 1310 **Age:** 16-50+ years **Gender:** mixed **Smoking status:** mixed **Sample type:** national sample	Sand colour with text warning on pack front, information on constituents on side panel, and information on the entire rear panel about health risks and available help	No features compared: approval of plain packs only	Facilitators & barriers	**Rel:** Low **Qual:** Medium
5	**Donovan 1993**	To assess the appeal of standard pack and the effect on smoking behaviours	Survey Interview method	**Location:** Australia **Sample size:** 1070 **Age:** 11-49 years **Gender:** mixed **Smoking status:** mixed **Sample type:** convenience sample	Standard packs with health warnings and in red and blue colour, but in lighter shades	Background colours Graphic and textual health warnings	Appeal Smoking attitudes & behaviour Facilitators and Barriers	**Rel:** High **Qual:** Medium
6	**Doxey 2011**	To examine the impact of female oriented cigarette packaging and plain packaging on women's beliefs and attitudes about smoking	Survey Online	**Location:** Canada **Sample size:** 512 **Age:** 18-25 years **Gender:** females only **Smoking status:** mixed **Sample type:** convenience sample	Plain packages as female-oriented packages without descriptors and with the colour and brand imagery removed. Pictorial health warning covering 50% of the principal display surface	Background colours Graphic and textual health warnings Message of health warnings Pack descriptors Pack shape and design Others : non-female packs	Appeal Harm Smoking attitudes & behaviour	**Rel:** Medium **Qual:** Medium

7	**Environics Research Group 2008a**	To examine the issue of the size of health warning messages on branded and plain packs among youths	Survey Interview method	**Location:** Canada **Sample size:** 1000 **Age:** 12-18 years **Gender:** mixed **Smoking status:** mixed **Sample type:** national representative sample	No details of colour given but plain packs had a brand name and health warning messages but no brand markings such as colours, fonts and logos	Size of health warnings	Harm Smoking attitudes & behaviour Facilitators & barriers	**Rel:** Medium **Qual:** Medium
8	**Environics Research Group 2008b**	To examine the issue of the size of health warning messages on branded and plain packs among adults	Survey Interview method	**Location:** Canada **Sample size:** 1000 **Age:** 18-55+ **Gender:** mixed **Smoking status:** smokers only **Sample type:** national representative sample	No details of colour given but plain packs had a brand name and health warning messages but no brand markings such as colours, fonts and logos	Size of health warnings	Harm Smoking attitudes & behaviour	**Rel:** Medium **Qual:** Medium
9	**Freeman 2010**	To assess what options of Australia's future tobacco control policy as the most important and effective	Survey Online	**Location:** Australia **Sample size:** 69 **Age:** not stated **Gender:** not stated **Smoking status:** not stated **Sample type:** purposive sample	Not applicable: Plain packaging policy	Not applicable: Plain packaging policy	Facilitators & barriers	**Rel:** Low **Qual:** Medium
10	**Gallopel-Morvan 2010b**	To assess the appeal of normal branded packs and white, grey, brown plain packs	Survey Interview method Hypothetical scenario	**Location:** France **Sample size:** 540 **Age:** 15-25 years **Gender:** mixed **Smoking status:** mixed **Sample type:** convenience sample	Grey, white or brown plain pack, with name of the brand, same font, same size and the usual health warning *Fumer tue* covering 30% of the front of the pack	Message of health warnings	Appeal Warnings Harm	**Rel:** High **Qual:** Medium

11	**Gallopel-Morvan 2011**	To examine perceptions of cigarette packaging of regular packs, limited edition packs and plain versions of the same cigarette brands (a) or regular packs and plain versions of the same cigarette brands (b)	Survey Interview method Hypothetical scenario	**Location:** France **Sample size:** 836 **Age:** 18-65+ **Gender:** mixed **Smoking status:** mixed **Sample type:** national representative sample	White, grey and light brown with brand name in black standardised font and text warning *Fumer tue* on pack front	No specific features compared: Respondents asked their views on plain packs relating to reduced consumption, quitting and health risks	Appeal (a, b) Harm (b) Smoking attitudes & behaviour (a,b)	**Rel:** High **Qual:** Medium
12	**Germain 2010**	To examine the effect of health warnings on plain packaging on adolescents' perceptions of cigarette packs	Survey Online	**Location:** Australia **Sample size:** 1087 **Age:** 14-17 years **Gender:** mixed **Smoking status:** mixed **Sample type:** convenience sample	3 plain cardboard brown packs Pack 1: retained the brand name font and positioning of descriptor Pack 2: with brand name in standard font in prominent position and with descriptor Pack 3: with smaller brand name in standard font and no. of cigarettes in larger font Pack 4: pack 3 with a large graphic health warning (covering 80% of the front of the pack) All the conditions had the same graphic health warning visible on the top (ie. 30% of the pack face)	Background colours Graphic and textual health warnings Message of health warnings Size/location of health warnings Brand fonts	Appeal Warnings Harm	**Rel:** High **Qual:** Medium

13	**Hammond 2009**	To examine the effect of health messages, labels and appeal of branded cigarette packs and plain packs on adults (a) and youths (b)	Survey (a), (b) Online	**Location:** UK **Sample size:** 516 (a), 806 (b) **Age:** mean 38.5 years (a), mean 14.6 years (b) **Gender:** mixed **Smoking status:** smokers only (a), mixed (b) **Sample type:** convenience sample	Plain packs with plain white or brown background. Name of each brand in Arial 14 point font All packs displayed the same pictorial health warning covering 30% of the 'front' of the pack	Background colours Graphic and textual health warnings Message of health warnings Pack descriptors	Appeal Harm	**Rel:** Medium **Qual:** Medium
14	**Hammond 2011a**	To examine perceptions of cigarette packaging and the potential impact of plain cigarette packaging regulations among female youth	Survey Online	**Location:** UK **Sample size:** 947 **Age:** 16-19 years **Gender:** females **Smoking status:** mixed **Sample type:** convenience sample	Plain female-oriented packs without brand imagery and no descriptors	Background colours Pack descriptors Others : non-female packs	Appeal Harm	**Rel:** High **Qual:** Medium
15	**Hammond 2011b**	To examine the effects of brand descriptors and brand colours, and plain or standardized packaging—on young women's beliefs about smoking	Survey Online	**Location:** US **Sample size:** 826 **Age:** 18-19 years **Gender:** females **Smoking status:** mixed **Sample type:** convenience sample	Plain brown cardboard box with no descriptors, no health warnings. Has name of brand and number of cigarettes on package. Same shape and size as branded packs	Background colours Pack descriptors Others : non-female packs	Appeal Harm Smoking attitudes & behaviour	**Rel:** Medium **Qual:** Medium

16	**Hoek 2009**	To analyse the impact of known, unknown and generic tobacco packages	Survey Interview method Hypothetical scenario	**Location:** New Zealand **Sample size:** 245 **Age:** mean 22 years **Gender:** mixed **Smoking status:** mixed **Sample type:** convenience sample	Plain pack with white background, textual health warning and pictorial health warning, brand name in plain black font, no descriptors	Background colours Graphic and textual health warnings Message of health warnings	Appeal	**Rel:** High **Qual:** Medium
17	**Hoek 2011a**	To assess the effects of exposure to a plain pack with a 75% graphic health warning measure on smokers' behaviour	Survey Interviews Hypothetical scenario	**Location:** New Zealand **Sample size:** 292 **Age:** mean 18-30 years **Gender:** mixed **Smoking status:** smokers **Sample type:** purposive sample	Plain pack with a 75% graphic health warning relative to a branded pack with a 30% graphic health warning	Graphic and textual warnings Size of health warnings Message of health warnings	Appeal Smoking attitudes & behaviour	**Rel:** High **Qual:** Medium
18	**Moodie 2012**	To examine the role of packaging in choice of cigarettes, perceptions of pack colours and strength and harm of different plain packs	Survey online	**Location:** UK **Sample size:** 658 **Age:** 10-17 years **Gender:** mixed **Smoking status:** mixed **Sample type:** convenience sample	Plain packs with different background colour - green red blue and white and health warning Brown packs with health warnings and different shapes and openings	Background colours Pack shape and method of opening	Appeal Harm Smoking attitudes behaviour	**Rel:** High **Qual:** Medium
19	**Munafò 2011**	To assess the impact of plain packaging on visual attention towards health warning information on cigarette packs	Survey Observation to track eye saccades	**Location:** UK **Sample size:** 43 **Age:** 21-28 years **Gender:** mixed **Smoking status:** mixed **Sample type:** convenience sample	White with brand name in black standardised font and combination of ten pictorial warnings used on pack front	Graphic and textual health warnings Size of health warnings Message of health warnings	Warnings	**Rel:** High **Qual:** Medium

20	**Swanson 1997** PhD thesis	To measure the effect of generic packaging in reducing the attractiveness of cigarettes to young smokers	Survey Interviews Hypothetical scenario	**Location:** Australia **Sample size:** 301 **Age:** 14-17 years **Gender:** mixed **Smoking status:** smokers **Sample type:** convenience sample	Plain packs in white background, with health warning and descriptors, brand name in plain black lettering	Overall brand image	Appeal	**Rel:** High **Qual:** Medium
21	**Thrasher 2011**	To estimate differences in demand associated with different health warning label formats and plain, unbranded packaging with smokers branded packaging.	Survey Observation to record bids Hypothetical scenario	**Location:** US **Sample size:** 402 **Age:** mean 38 years **Gender:** mixed **Smoking status:** smokers **Sample type:** convenience sample	Plain packs with graphic and textual warnings of mouth cancer, covering 50% of the lower half of the front, back and one side of the package. All colour and symbolic brand elements removed	Graphic and textual warnings Size of health warnings Message of health warnings	Appeal	**Rel:** Medium **Qual:** Medium
22	**Wakefield 2008**	To examine if smokers will rate an original branded pack more positively than their plain pack counterparts	Survey Online	**Location:** Australia **Sample size:** 813 **Age:** 18-30+ years **Gender:** mixed **Smoking status:** smokers **Sample type:** national non-representative sample	3 plain cardboard brown packs Pack 1: retained the brand name font and positioning of descriptor Pack 2: with brand name in standard font in prominent position and with descriptor Pack 3: with smaller brand name in standard font and no. of cigarettes in larger font Pack 4: pack 3 with a large graphic health warning (covering 80% of the front of the pack) All the conditions had the same graphic health warning visible on the top (ie. 30% of the pack face)	Overall brand image	Appeal Harm	**Rel:** High **Qual:** Medium

23	**White 2011** MSc thesis	To examine the impact of brand imagery and plain packaging on brand appeal and pack selection among youth	Survey Online	**Location:** Brazil **Sample size:** 640 **Age:** 14-26 years **Gender:** female **Smoking status:** mixed **Sample type:** national representative sample	2 plain packs with mid-brown background colour Pack 1: generic black font in brand name, same shape/size of container as brand. No health warning Pack 2: same as Pack 1 but with no descriptors	Background colours Pack descriptors Overall pack image	Appeal Harm	**Rel:** High **Qual:** Medium
Qualitative studies (n=8)								
24	**Carter 2006**	To explore laypeople's opinions relating to tobacco regulatory options, including plain packaging	Discussion group	**Location:** Australia **Sample size:** 138 **Age:** 18-64 years **Gender:** mixed **Smoking status:** mixed **Sample type:** purposive sample	Plain cardboard boxes with only the brand name and the health warning	Not applicable: Plain packaging policy	Facilitators & barriers	**Rel:** Low **Qual:** Medium
25	**Centre for Behavioural Research in Cancer 1992b**	To assess adolescents' reactions to cigarette packs modified to increase extent and impact of health warnings size, and standardised packaging	Interview	**Location:** Australia **Sample size:** 66 **Age:** 12-20 years **Gender:** mixed **Smoking status:** mixed **Sample type:** convenience sample	Sand colour with text warning on pack front *Smoking Causes Lung Cancer*, additional information on constituents on one of the side panels, and information on the entire rear panel about health risks and available help	Background colours Graphic and textual health warnings Size of health warnings Pack descriptors	Appeal Warnings Facilitators & barriers	**Rel:** Medium **Qual:** Medium

26	**CNCT 2008a**	To evaluate the impact of plain packs relating to resistance and motivations to the plain packs	Interview	**Location:** France **Sample size:** 34 **Age:** 15-45 years **Gender:** mixed **Smoking status:** mixed **Sample type:** convenience sample	Grey with brand name in black standardised font and text warnings (Smoking seriously harms you and others around you - *Fumer nuit gravement a votre santé et a celie de votre entourage* on front and back of pack	Background colours Graphic and textual health warnings	Appeal Warnings Smoking attitudes & behaviour Facilitators & barriers	**Rel:** High **Qual:** High
27	**CNCT 2008b**	To explore views on plain tobacco packaging with or without graphic health warnings	Interview	**Location:** France **Sample size:** 20 **Age:** 17-64 years **Gender:** mixed **Smoking status:** mixed **Sample type:** convenience sample	2 grey plain packs Pack 1: with same warnings as brand pack with textual warnings on both sides S*moking Kills* for the front textual warning and S*moking Provokes Lung Cancer* on the back of the pack Pack 2: with same warnings as brand pack with textual warnings on the front side S*moking Kills* and a combined textual and visual warning on the back S*moking Can Cause a Slow and Painful Death*	Background colours Graphic and textual health warnings Message of health warnings location of health warnings	Appeal Warnings	**Rel:** High **Qual:** Medium
28	**Gallopel-Morvan 2010a**	To explore the impact of plain packaging with pictorial health warnings and different plain pack base colours	Focus groups	**Location:** France **Sample size:** 50 **Age:** 15-45 years **Gender:** mixed **Smoking status:** mixed **Sample type:** convenience sample	2 grey plain brand packs with or without pictorial warnings on the front face 3 plain packs of different colours (white, grey and brown) with text *Fumer tue* on one face and a pictorial warning on the reverse face	Background colours Graphic and textual health warnings Message of health warnings Size of health warnings	Appeal Warnings Harm	**Rel:** High **Qual:** Medium

29	**Hoek 2011b**	To explore how plain cigarette packaging would influence the perceived identities of young adults	Focus groups	**Location:** New Zealand **Sample size:** 86 **Age:** 16-25 years **Gender:** mixed **Smoking status:** mixed **Sample type:** convenience sample	Plain pack with warnings that covered 30% and 75% of the pack front on a white background.	Background colours Graphic and textual health warnings Message of health warnings Size of health warnings	Appeal Smoking attitudes & behaviour	**Rel:** High **Qual:** Medium
30	**Moodie 2011a**	To explore smokers' perceptions of pack innovation (shapes and opening methods) and plain colour packaging	Focus groups	**Location:** UK **Sample size:** 54 **Age:** mean 18-35 years **Gender:** mixed **Smoking status:** smokers **Sample type:** purposive sample	4 identical plain packs in dark grey, light grey, dark brown, light brown/beige colours, without brand names or descriptors or tar or nicotine levels, but with health warnings on the front panel of the pack and pictorial images on the rear panel	Background colours Pack shape and design Method of pack opening	Appeal Harm Smoking attitudes & behaviour Facilitators and Barriers	**Rel:** High **Qual:** High
31	**van Hal 2011**	To estimate the effect of the appearance of cigarette package on the smoking behaviour of young people in Flanders.	Focus groups	**Location:** Belgium **Sample size:** 55 **Age:** mean 15-19 years **Gender:** mixed **Smoking status:** smokers **Sample type:** convenience sample	White with brand name printed in a smaller and thinner font, no logos. Text warning *Smokers Die Younger* on pack front and pictorial (Foot of a dead body in a mortuary) on the reverse panel	Background colours Graphic and textual health warnings Message of health warnings	Appeal Warnings Smoking attitudes & behaviour	**Rel:** Medium **Qual:** Medium

Mixed method studies (n=4)								
32	**Centre for Health Promotion 1993**	To assess the impact of plain packaging on tobacco use among adolescents and experts in tobacco research	Survey (a) Questionnaires Focus groups (b)	**Location:** Canada **Sample size:** 129 (a), 27 (b) **Age:** 12-17 years (a), Not stated (b) **Gender:** mixed (a), not stated (b) **Smoking status:** mixed (a), not stated (b) **Sample type:** regionally representative sample (a), purposive sample (b)	Buff colour plain packages were with black printing in standard font. Only the brand names, health warning label appeared on these packages. All packages carried the warning C*igarettes Cause Fatal Lung Disease*, covering the top 25% of the package front and back, with a black border around it, in black lettering on a white background	Overall pack image	Appeal Smoking attitudes & behaviour	**<u>Survey</u>:** **Rel:** Medium **Qual:** Medium **<u>Focus groups</u>:** **Rel:** High **Qual:** Medium
33	**Goldberg 1995**	To assess the impact of plain and generic packaging of cigarettes on recall of health warning messages and on uptake or cessation of smoking among teenagers and adults	Survey (a) Focus groups Teens (b) Adults (c)	**Location:** Canada **Sample size:** 1200 (a), 400 (b), 100 (c) **Age:** 14-17 years (a), 12-14 years (b), 30-50 years (c) **Gender:** mixed **Smoking status:** mixed **Sample type:** regionally representative sample (a), convenience sample (b) (c)	2 plain packs in plain white box with and without health warning	Background colours Message of health warnings	Appeal Warnings Smoking attitudes & behaviour Facilitators & barriers	**<u>Survey</u>:** **Rel:** High **Qual:** Medium **<u>Focus groups</u>:** **Rel:** Medium **Qual:** Low

34	**Rootman 1995**	To examine the impact of plain packaging on recall of health warning information, and the impact of changes in price on youth smoking	Survey (a) Focus groups (b)	**Location:** US and Canada **Sample size:** 2132 (a), 339 (b) **Age:** 12-14 years (a), 12-17 years (b) **Gender:** mixed **Smoking status:** mixed **Sample type:** regionally representative sample (a, b)	No details given, only that plain packs should be light brown or white	Background colours Graphic and textual health warnings Message of health warnings	Appeal Warnings Smoking attitudes & behaviour	**Survey**: **Rel:** High **Qual:** Medium **Focus groups:** **Rel:** Medium **Qual:** Low
35	**Shanahan 2009**	To examine reaction to the graphic health warnings on cigarette packs	Survey (a) Group discussions (b) Stakeholder interviews (c)	**Location:** Australia **Sample size:** (a) 1304 (b) 164-206, (c) 28 **Age:** 15-65+ years (a), 15-69 years (b), not stated (c) **Gender:** mixed (a, b).not stated (c) **Smoking status:** mixed (a, b), not stated (c) **Sample type:** regionally representative sample (a) , convenience sample (b) (c)	'Generic' packaging, no description provided	Graphic and textual health warnings Message of health warnings	Facilitators & barriers	**Survey**: **Rel:** Medium **Qual:** High **Group discussions**: **Rel:** Low **Qual:** Medium **Stakeholder interviews**: **Rel:** Medium **Qual:** Medium

Intervention studies (n=2)								
36	**Carter 2011**	To assess transaction time in selecting colour and plain cigarette packs in shops	Randomised trial Recording speed using stopwatch	**Location:** Australia **Sample size:** 52 **Age:** 17-24years **Gender:** mixed **Smoking status:** non-smokers **Sample type:** convenience sample	Dull brown coloured cardboard with the brand name and quantity of cigarettes printed in a standard font size cigarettes printed in a standard, black larger font size on the bottom half of the face. No health warnings	Background colours	Facilitators & barriers	**Rel:** Low **Qual:** High
37	**Moodie 2011b**	To explore the impact of plain cigarette packs in real-life settings among young adults	Intervention: randomised study (a) Interview (b)	**Location:** Scotland **Sample size:** 48 (a), 18(b) **Age:** 18-35 years (a, b) **Gender:** mixed **Smoking status:** smokers **Sample type:** random quota sample	Dark brown plain pack with fictitious brand name in black standardised font and text warning *Smoking Kills* on pack front and pictorial warning (Diseased and healthy lungs) on reverse panel	Graphic and textual health warnings Size of health warnings Message of health warnings Others: overall pack perceptions	Appeal Harm Warnings Smoking attitudes & behaviour	**Intervention**: **Rel:** High **Qual:** Medium **Interview**: **Rel:** High **Qual:** Medium

4.2 Appeal of Cigarettes, Packs and Brands

Key findings:

- All studies reported that plain packs were rated as less attractive than branded equivalent packs, by both adults and children.
- Plain packs were perceived to be poorer quality, poorer tasting and cheaper than branded equivalent packs.
- Positive impressions of smoker identity and personality attributes associated with specific brands were weakened or disappeared with plain packaging.
- Non-smokers and younger people responded more negatively to plain packs than smokers and older people.

Twenty-eight studies examined whether and how plain packs impact on the appeal of cigarette products, packs and brands. Seventeen were cross-sectional surveys which examined the impact of plain packaging on the appeal of packs, products and brands among young people and adults. One was a 'naturalistic intervention' study in which smokers used a plain pack and their own branded pack for two weeks each in everyday settings. There were three mixed methods studies involving quantitative and qualitative elements. Seven further studies used primarily qualitative methods to explore how perceptions of the appeal of cigarette packs are affected when plain packaging is used. The study populations comprised adults and young people in Australia, Belgium, Brazil, Canada, France, New Zealand, the UK and the USA.

4.2.1 Quantitative Studies

Twenty-one studies using quantitative methods examined the impact of plain packs on appeal. Seventeen were cross-sectional surveys, one a naturalistic intervention study and three were mixed methods studies. As the studies took a wide range of appeal measures and as there is some overlap between the concepts used, we have grouped the findings here into three themes:

- *Attractiveness*. This theme includes perceived attractiveness, liking, ratings of visual appearance such as 'interesting/boring/dull', and preferences for a 'gift' to take away at the end of the study.
- *Quality*. This theme includes perceptions of quality, taste, smoothness and cheapness.
- *Smoker identity*. This theme includes perceptions of 'what kind of smoker would smoke this pack'; whether a pack is seen as appealing to a particular group; and personality attributes associated with a brand or pack.

Findings are summarised in Table 4.2 below, which indicates the nature of the comparison made in the study and the direction of effect. 'Favours branded packs' means that respondents found the branded packs more attractive than plain packs or thought that they contained better quality cigarettes, or that positive smoker identity attributes were stronger for branded packs than for plain packs. One study (Moodie 2012) did not compare branded and plain packs, but showed respondents

different colours of plain packs. An empty cell indicates that a study did not address the outcome in question.

Table 4.2: Directions of Effect: Attractiveness, quality and smoker identity

Study	Type of Comparison	Attractiveness Rating	Quality Rating	Smoker identity Rating
Bansal-Travers 2011	Branded vs. plain	Favours branded packs	Favours branded packs	
Bondy 1996	Branded vs. plain	Favours branded packs		
Centre for Health Promotion 1993	Branded vs. plain	Favours branded packs	Favours branded packs	Favours branded packs
Donovan 1993	Branded vs. plain	Favours branded packs		Favours branded packs
Doxey 2011	Branded vs. plain	Favours branded packs	Favours branded packs	Favours branded packs
Gallopel-Morvan 2011	Branded vs. plain	Favours branded packs		
Gallopel-Morvan 2010b	Branded vs. plain	Favours branded packs	Favours branded packs	Favours branded packs
Germain 2010	Branded vs. plain	Favours branded packs	Favours branded packs	Favours branded packs
Goldberg 1995	Branded vs. plain			Favours branded packs
Hammond 2011a	Branded vs. plain	Favours branded packs	Favours branded packs	Favours branded packs
Hammond 2009	Branded vs. plain	Favours branded packs	Favours branded packs	
Hammond 2011b	Branded vs. plain	Favours branded packs	Favours branded packs	Favours branded packs
Hoek 2009	Branded vs. plain	Favours branded packs		
Hoek 2011a	Branded vs. plain	Favours branded packs		
Moodie 2012	Different colours of plain packs	Plain packs rated negatively	Favours lighter-coloured plain packs	Plain packs rated negatively
Moodie 2011b	Branded vs. plain	Favours branded packs	Favours branded packs	
Rootman 1995	Branded vs. plain	Favours branded packs		Favours branded packs
Swanson 1997	Branded vs. plain			Favours branded packs
Thrasher 2011	Branded vs. plain	Favours branded packs		
Wakefield 2008	Branded vs. plain	Favours branded packs	Favours branded packs	Favours branded packs
White 2011	Branded vs. plain	Favours branded packs	Favours branded packs	Favours branded packs

Attractiveness

Nineteen studies examined the perceptions or ratings of the attractiveness of plain packs. Fifteen were cross-sectional surveys which used a range of statistical analysis approaches to compare participants' perceptions of the attractiveness of plain and branded packs, and one was a cross-sectional survey which examined perceptions of plain packs without comparing them with branded

packs. Two were mixed methods studies which included a cross-sectional survey element. There was one naturalistic intervention study in which participants used plain and branded packs for two weeks each over a four-week period.

As Table 4.2 shows, all of these studies found that plain packs were rated as being less attractive than branded equivalent packs, by both adults and children.

Studies comparing different types of plain pack
Four cross-sectional surveys (Hoek 2011a, Wakefield 2008, Germain 2010, White 2011) compared response to plain packs which had retained different amounts of original branding and information. Consistently these studies found that removing branding elements other than essential information (ie. brand name in plain font) increased the likelihood that the plain pack would be perceived as unattractive by both adults and children.

Wakefield and colleagues (Wakefield 2008) conducted an online experimental survey with Australian adults comparing perceptions of branded packs with those of progressively plainer packs. Logistic regression analysis found that the plain pack which preserved brand name font, placement and brand variants was rated as less attractive ($p<0.01$) than the original branded pack, and that this difference increased ($p<0.001$) as progressively more brand elements were removed.

Germain and colleagues' (Germain 2010) experimental survey comparing Australian teenagers' response to different types of plain packs compared with branded packs found that positive pack ratings ('popular brand', 'attractive', 'value for money', 'exclusive', 'brand would try/smoke') reduced significantly ($p<0.001$) as more branding elements were removed from the plain packs.

A similar approach was adopted by White (White 2011) in a survey of 16-29 year old women in Brazil. The study found that the more elements of branding, including descriptors, were removed, the less appealing the pack was rated. Compared with branded packs, plain packs were rated as significantly less appealing ($p<0.01$) and less desirable to be seen smoking with. Perceptions of pack appeal were also reflected in participants' preference for a branded rather than a plain pack to take away as a gift for their participation in the study. No cigarette packs were given out, but participants were asked to indicate which pack they would choose if able to take one. Over half of the 340 participants elected to choose a pack. Almost 40% chose a branded pack, and more than 12% chose a plain pack, with the remainder indicating they did not wish to receive a pack.

Hoek and colleagues (Hoek 2011a) asked adult smokers in New Zealand to rate plain and branded packs from 'best' to 'worst' choice in terms of attractiveness and other attributes. The plain packs varied in the amount of original branding elements and information retained. Overall, they found that as pack branding elements were reduced, choice of these packs as 'best' declined and those chosen as 'worst' increased. The least branded packs were significantly ($p=0.000$) less likely to be chosen than the fully branded options.

Other studies with young people and children
Four studies conducted with young people and children (rather than adults or a mixed age sample) found that plain packs were less appealing than branded packs. First, a mixed methods study which included a cross-sectional survey of teenagers in Ontario (Centre for Health Promotion 1993) found that plain packs were rated significantly ($p<0.001$) more negatively than brand equivalent packs by both smokers and non-smokers on all attractiveness ratings (ugly/attractive, boring/exciting, old-fashioned/modern, awful/nice, dull/colourful, nerdy/cool). Likewise in the nationally representative Canadian Youth Smoking Survey, Bondy and colleagues (Bondy 1996) found that 71% of participants (10-14 year olds) ranked the single plain pack presented (amongst many branded packs) as the least

attractive (significant value not given). In Rootman and colleagues' (Rootman 1995) mixed methods study which included a survey of schoolchildren in Canada and the USA, the majority stated that they preferred and would rather take home a branded pack than a plain pack, which was described as more 'boring' and 'ugly' (significance values not given).

In another study with children, this time in Scotland, Moodie and colleagues' (Moodie 2012) online survey of 10-17 year olds found that a majority rated a plain, fliptop (regular shape) pack as 'unattractive' (91%), 'uncool' (87%) and 'a pack you would not like to be seen with' (88%). They were also considered to be smoked by 'unpopular' (59%), 'unfashionable' (67%), 'boring' (63%), and older people (69%). No comparisons were made in this study with branded packs.

Studies with young women

Three studies examined and compared young women's responses to four types of pack - branded packs targeted at women, branded packs targeted at women but with descriptor terms such as 'super slims' removed, branded packs targeted at men, and plain packs. Doxey and Hammond's (Doxey 2011) cross-sectional survey conducted with 18-25 year old women in Canada and found that plain packs were rated as significantly ($p<0.05$) less appealing than branded packs that were aimed at women for all brands with the exception of the Camel, XS and Silk Cut variants. Plain packs were also given lower appeal ratings than packs targeted at men ($p=0.004$). In a linear regression, a significant main effect of condition was found such that branded packs were rated as significantly more appealing than packs with no descriptors ($p=0.02$). packs targeted at men ($p<0.001$) and plain packs ($p<0.001$).

A similar cross-sectional survey of 18 and 19 year old American women (Hammond 2011b) found that plain packs were rated as significantly ($p<0.05$) less appealing than any branded pack presented in the study. In a linear regression, a significant main effect of condition was found such that branded packs were rated as significantly more appealing than plain packs ($p<0.001$) and packs targeted at men ($p<0.001$). Plain packs were also significantly less appealing than packs with no descriptors ($p<0.001$) and packs targeted at men ($p<0.001$). Significantly fewer plain packs than branded packs were selected when participants were asked to select a pack at the end of the study, with branded female-targeted packs being 2.7 times more likely to be selected than the plain packs. In a similar cross-sectional survey this time conducted with 16-19 year old UK females (Hammond 2011a), plain packs were rated as significantly less appealing ($p<0.001$) than branded packs targeted at women. When participants were asked whether they wished to receive a pack at the end of the study, 51.8% of those offered a branded pack accepted, compared with 44.6% offered a plain pack. Overall, participants offered plain packs were significantly less likely to accept a pack than participants offered branded packs (χ^2 =5.0, $p=0.026$). In neither of the studies involving pack selection tasks were packs actually given to participants.

Other studies

Seven other studies examined the perceived attractiveness of plain packs. Moodie and colleagues (Moodie 2011b) carried out a naturalistic intervention study with a sample of 140 young adult smokers in Glasgow. Smokers were asked to transfer their cigarettes from their own packs to plain packs provided and use these plain packs for two weeks, either at the beginning or end of the four week experimental period, and use their own packs for the other two weeks of the study. Throughout the study participants rated a plain brown pack significantly more negatively than their own pack in terms of stylishness ($p<0.001$), fashionability ($p<0.01$), coolness ($p<0.001$), attractiveness ($p<0.001$) and appeal ($p<0.001$).

Hammond and colleagues (Hammond 2009), in their survey of adults and young people aged 11-17 in the UK, found that plain packs were consistently rated as significantly less attractive ($p<0.001$)

than branded counterparts, by both adults and young people, for plain packs in both white and brown.

In a cross-sectional survey with 15-25 year olds in France, Gallopel-Morvan and colleagues (Gallopel-Morvan 2010b) found that a branded pack was rated statistically significantly higher ($p<0.001$) than three plain packs (grey, white and brown) in respect to being 'attention grabbing', 'attractive', 'nice' and 'flashy'. Another cross-sectional survey in France, this time with adults (Gallopel-Morvan 2011), found that plain packs were rated as significantly ($p<0.001$) less likely to attract attention and less attractive than branded packs.

Among smoking and non-smoking adults in the USA, Bansal-Travers and colleagues (Bansal-Travers 2011) found in a cross-sectional survey that a branded pack was rated as significantly ($p<0.001$) more attractive and more likely to be bought than a plain pack.

In Hoek and colleagues' (Hoek 2009) cross-sectional survey of young adults in New Zealand, smokers and non-smokers were asked to rate plain and branded packs from 'best' to 'worst' choice in terms of attractiveness and other attributes. Overall, participants were 25 times more likely to give a plain pack with a health warning label the 'worst' rating ($p<0.002$) than an unknown branded pack with a warning label.

Thrasher and colleagues (Thrasher 2011) assessed the preferences of adults in the USA using a hypothetical scenario in which individuals were asked to state the amount they would 'bid' for different types of cigarette pack. The four types of pack were: fully branded pack with a text health warning on 50% of one side of the pack, branded pack with 50% textual health warning on the front, side and back, branded pack with 50% picture and text health warning; and plain pack with 50% picture and text health warning. The mean average of the bids decreased across conditions (branded minimal warning text 1: $3.52; Larger text 2: $3.43; Picture and text 3: $3.11; Picture, text and plain pack 4: $2.93). Demand was significantly lower for both packs with prominent pictorial warnings, with the lowest demand associated with the plain pack. The researchers compared the results from the branded pack with the pictorial warning and the plain pack with the pictorial warning to find out if there was a significant difference between the two types of packaging. Results from both bivariate ($p<0.01$) and multivariate models ($p<0.01$) indicate statistically significant, lower bids for the plain, unbranded pack.

In Australia, Donovan (Donovan 1993) conducted a survey of young and adult (aged 11 to 49) smokers' and non-smokers' views of plain and branded packs and found that, in comparison to existing branded packs, plain packs were seen as less attractive, less colourful and more likely to deter purchase (significance values not given).

Quality of cigarettes

Twelve studies examined perceptions of the quality of cigarettes in plain packs. Nine were cross-sectional survey studies which compared perceptions of plain and branded packs in terms of dimensions such as perceived quality, taste, smoothness and cheapness, and one was a cross-sectional survey which examined perceptions of plain packs without comparing them with branded packs. One was a mixed methods study which included a cross-sectional survey element, and one was a naturalistic intervention study in which participants used plain and branded packs for two weeks each over a four-week period.

As Table 4.2 above shows, all of the studies that measured perceived quality found that cigarettes in plain packs were perceived as being of lower quality compared to those in branded packs.

Studies comparing different types of plain pack

Three studies (Wakefield 2008, Germain 2010, White 2011) compared response to plain packs which had retained different amounts of original branding and information in terms of perceptions of taste and quality.

Wakefield and colleagues (Wakefield 2008) conducted an online experimental cross-sectional survey with Australian adults comparing perceptions of branded packs with those of progressively plainer packs. Bivariate logistic regression analysis found that as packs became plainer, they were rated as less rich in tobacco flavour ($p<0.05$) , with the plainest pack also rated as less satisfying ($p<0.05$) and less likely to be of the highest quality tobacco ($p<0.05$).

White's (White 2011) online survey with Brazilian smokers and non-smokers aged 16-26 found that compared with branded packs, plain packs were rated as significantly poorer tasting ($p<0.001$) and less smooth ($p<0.05$), and that this difference in rating increased as descriptors were removed from the plain packs.

Likewise Germain and colleagues' (Germain 2010) experimental survey comparing Australian teenagers' response to different types of plain packs compared with branded packs found that positive taste ratings ('rich', 'satisfying', 'high quality') were significantly ($p<0.001$) lower for the plainest pack compared with the branded pack, and that these differences in rating increased as packs became progressively plainer.

Other studies

Hammond and colleagues (Hammond 2009), in their cross-sectional online survey of adults and children in the UK, found that cigarettes in plain brown packs were perceived as being significantly less smooth in taste ($p<0.001$) than cigarettes in branded counterpart packs across all brands and by both adults and children, although differences in perceived taste were found less often for plain white packs compared with branded packs.

In the UK, a cross-sectional survey of 16-19 year old females (Hammond 2011a) found that cigarettes in plain packs were perceived as poorer in taste than cigarettes in branded packs targeted at women. In a linear regression, a significant main effect of condition was found such that branded packs were given higher taste ratings than the *plain* packs ($p<0.001$) and the packs targeted at men ($p<0.001$), and plain packs were given lower taste ratings than packs targeted at men ($p=0.027$) and packs with no descriptors ($p=0.013$).

Similarly, a cross-sectional survey of 18 and 19 year old American women (Hammond 2011b) found that cigarettes in plain packs were perceived as significantly 'worse tasting' than cigarettes in branded packs for six of the eight brand comparisons. In a linear regression, a significant main effect of condition was found such that branded packs were given higher taste ratings than packs with no descriptors ($p=0.004$) and plain packs ($p<0.001$), and plain packs were given lower taste ratings than packs targeted at men ($p<0.001$) and packs with no descriptors ($p<0.001$).

In Doxey and Hammond's (Doxey 2011) cross-sectional survey of 18-25 year old women in Canada, cigarettes in plain packs were perceived as tasting significantly poorer ($p<0.05$) than three branded packs with flavour descriptors (Benson and Hedges Menthol, Capri Vanilla and Capri Cherry). In a linear regression, a significant main effect of condition was found such that branded packs were given higher taste ratings than plain packs ($p<0.001$), packs with no descriptors ($p=0.01$), and packs targeted at men ($p=0.004$). Plain packs were also rated lower in taste than packs targeted at men ($p=0.01$) and packs with no descriptors ($p=0.004$).

In a cross-sectional survey of smoking and non-smoking adults in the USA, Bansal-Travers and colleagues (Bansal-Travers 2011) found that branded pack cigarettes were rated as significantly ($p<0.001$) more smooth tasting and better quality than plain pack cigarettes.

In a cross-sectional survey of 15-25 year olds in France, Gallopel-Morvan et al (Gallopel-Morvan 2010b) found that a branded pack was rated statistically significantly higher ($p<0.001$) than three plain packs (grey, white and brown) in respect to being 'expensive' and containing 'good quality' cigarettes.

A mixed methods study including a survey with Canadian teenagers (Centre for Health Promotion 1993) found that plain packs were rated as significantly ($p<0.001$) more 'cheap-looking' than brand equivalent packs by both smokers and non-smokers.

In a naturalistic intervention study with young adult smokers in Glasgow (Moodie 2011b), participants smoked their own brand of cigarettes for a period of four weeks, using plain packs for two of these weeks and their own branded packs for the other two weeks. The study found that participants rated the plain brown packs as significantly less expensive ($p<0.001$) and poorer quality ($p<0.001$) than their own branded packs for each of the four weeks. Also in Scotland, Moodie and colleagues' (Moodie 2012) online survey of 10-17 year olds which compared different colours of plain packs (red, green, light blue and white) found that lighter coloured plain packs were generally associated with weaker taste. Plain packs were not compared with branded packs in this study.

Smoker identity

An important facet of cigarette pack appeal is the extent to which the pack is associated in people's minds with a desirable smoker identity, and this was examined in 13 studies in the review. Nine were cross-sectional surveys which compared whether perceptions of smoker identity associated with plain packs differed from perceptions of smoker identity associated with branded packs, and one was a cross-sectional survey which explored identity attributes associated with plain packs without comparing them with branded packs. Three were mixed methods studies which included a cross-sectional survey element. Measures used for assessing smoker identity included:

- ratings of packs on projected personality attributes such as 'popular', 'cool' or 'sophisticated';
- visual experiments which measure the strength of association between specific brands and person types or identities;
- asking participants whether a pack is perceived to be targeted at or likely to be smoked by a group similar to them.

As can be seen from Table 4.2, the directions of effect are again consistent across studies, with plain packs being associated with a less positive smoker identity than branded packs.

Personality attributes

Six cross-sectional surveys examined the personality attributes associated with plain and branded packs. Wakefield and colleagues (Wakefield 2008) conducted a cross-sectional online experimental survey with Australian adults comparing perceptions of typical smokers of branded packs with those of progressively plainer packs. The study found that smokers of plain packs (which preserved brand name, font, placement and brand variants) were rated as less *sociable/outgoing* ($p<0.01$ – $p<0.001$) and *trendy/stylish* ($p<0.10$ – $p<0.001$) than smokers of the original branded packs, and that these negative perceptions increased as progressively more brand elements were removed, with smokers of the plainest pack also being rated as less *mature* ($p<0.05$) and less *masculine* ($p<0.01$).

Three cross-sectional surveys, in Canada (Doxey 2011), the USA (Hammond 2011b) and the UK (Hammond & Daniel, 2011a), examined the strength of young women's 'smoker trait' associations with different cigarette packs. The trait associations were *female, slim, glamorous, cool, popular, attractive* and *sophisticated* in all three studies, plus *exciting* in the Doxey study. In all three studies, plain packs received significantly fewer positive ratings for all traits (except *exciting* in the Doxey & Hammond study, for which no differences were found across experimental conditions). In linear regression analyses in all three studies, a significant main effect of condition was found such that branded packs were given higher ($p<0.001$) trait scores than plain packs.

Using a similar method, White (White 2011) asked 16-26 year old women in Brazil to rate smokers of different packs on five image traits: *female/male, stylish/not stylish, popular/not popular, sophisticated/not sophisticated,* and *slim/overweight*. Smoker image ratings were significantly lower for plain than branded packs for three of the traits, *female* ($p<0.05$), *stylish* ($p<0.05$) and *sophisticated* ($p<0.05$). In a linear regression analysis, a significant main effect was found such that plain packs ($p=0.001$) and plain packs with no descriptors ($p<0.001$) were less likely to be rated as *female* compared to their branded counterparts. Plain packs with no descriptors were also less likely to be rated as *female* than other plain packs ($p<0.001$).

One Australian study examined children's ratings of packs on projected personality attributes. Germain and colleagues' (Germain 2010) experimental survey with Australian teenagers found that positive smoker attribute ratings of the type of person who would smoke each pack ('*trendy', 'young', 'masculine', 'sociable', 'confident'*) reduced significantly as more branding elements were removed from the packs. Respondents who saw the plainest pack also rated smokers of that pack to be more *'lower class'* ($p<0.01$) than did those who saw the original pack.

Visual experiments

A mixed methods study (Goldberg 1995) and a cross-sectional survey (Swanson 1997) included visual image experiments with teenagers to assess the strength of association between specific brands and person types, and the impact on these associations of plain packaging. In Swanson's study, Australian teenagers were shown a series of packs, each accompanied by two images of people (one consistent with the brand, such as an outdoor man for the brand Marlboro, one inconsistent with the brand, such as a young woman for a brand typically smoked by older people), and asked if the pack was *'right or wrong'* for the person. When plain packs were shown instead of branded packs, respondents' positive associations of brands with the 'right' sort of person for the brand weakened, as did their negative associations with the 'wrong' sort of person. The differences were significant for four of six comparisons ($p<0.01$ – $p<0.001$). The Goldberg and colleagues' (Goldberg 1995) study in Canada used a similar approach. For all three Canadian brands included in the study, the removal of brand markings by introducing a plain pack led respondents to view the pack as less appropriate for the person image which was normally associated with the brand.

Pack targeting

Four studies, three conducted with young people and one with a mixed sample, examined the issue of whether a pack was perceived to be targeted at or likely to be smoked by a group similar to those involved in the study.

In Rootman and colleagues' (Rootman 1995) survey of Canadian 12-14 year olds, conducted as part of a mixed methods study, a branded pack was associated with 'cool kids' by 64% of respondents, compared with only 5% associating a plain pack with 'cool kids' (significance values not given). Also in Canada, a mixed methods study including a cross-sectional survey with teenagers (Centre for Health Promotion 1993) found that plain packs were rated significantly ($p<0.001$) more appropriate to *'old people'* than *'young people'* by both smokers and non-smokers, even where the plain pack

brand was one favoured by young people. Similarly, in a cross-sectional survey in Australia, Donovan (Donovan 1993) found that in comparison to existing branded packs, plain packs were seen by young smokers and non-smokers as more appropriate to *'old people'* than *'young people*', and less *'ok to be seen with'* (significance values not reported).

In a survey of 15-25 year olds in France, Gallopel-Morvan et al (Gallopel-Morvan 2010b) found that a branded pack was rated higher (p=0.018) than a grey branded pack in terms of *'targeting young people'.*

Finally, Moodie and colleagues' (2012) online survey of 10-17 year olds in Scotland found that a majority agreed that the sort of person who would smoke a plain, fliptop (regular shape) pack would be *'unpopular'* (59%), '*unfashionable'* (67%), '*boring'* (63%), and '*old'* (69%). Plain packs were not compared with branded packs in the study.

4.2.2 Qualitative Studies

Ten studies (seven primarily qualitative, two mixed methods studies and an intervention study which included qualitative interviews) used qualitative methods to explore how perceptions of the appeal of cigarette packs are affected when plain packaging is used. Qualitative methods are particularly valuable for exploring the meanings associated with products and behaviours as they allow for more complex questioning and the use of indirect projective techniques.

Four key themes emerged from the qualitative studies to explain why plain packs were consistently rated as less attractive and lower quality and had a poorer image than branded packs:

- Plain pack colours have negative connotations.
- Plain packs weaken attachment to brands.
- Plain packs project a less desirable smoker identity.
- Plain packs expose the reality of smoking.

Plain pack colours have negative connotations
A number of studies found that the colours used in plain packs had negative associations for study participants. In focus groups with 12-20 year old smokers and non-smokers in Australia (Centre for Behavioural Research in Cancer 1992b), sand-coloured plain packs evoked comparisons with "*medicine*" and *"school uniforms"*, and were described as "*ugly*" and *"cheap and nasty*". White packs, in van Hal's (2011) focus groups with Belgian teenagers, were seen as dull and associated with low prestige budget packaging ("*something of only one euro*"). Buff-coloured plain packs in focus groups with Canadian teenagers (Centre for Health Promotion 1993) were associated with staleness and cheapness. However, in the same study, white plain packs evoked more positive connotations of cleanness and freshness.

Three qualitative studies in France explored the associations and emotions evoked by grey plain packs. In a study comparing French teenagers' and adults' perceptions of branded Marlboro and Camel packs with equivalent plain packs (CNCT 2008a), grey packs were described as "*less attractive*", "*sad*", and "*flat*", with connotations of an old-fashioned world: *"We are in a period where everything is flashy. When you have an iPod in your hand, there are a lot of colours. This pack is black and white, it's like we have an old TV".* In a small focus group study exploring the perceptions of French 17-64 year old smokers and non-smokers (CNCT 2008b), a plain grey pack was described as "*ugly*", "*dark*" and "*a pack which looks like a coffin*".

A more recent focus group study with French 15-45 year old smokers and non-smokers (Gallopel-Morvan 2010a) similarly found that grey plain packs evoked many negative associations in participants' minds with dirt, sadness, poison, lifelessness and smoke. However, grey packaging also had positive connotations for some participants of recycling and trendiness. This study also explored perceptions of brown and white packs, and found that both evoked mixed connotations, with brown packs being associated with warmth, chocolate and suede, as well as cheapness and impurity, and white packs being associated with cleanness, cosmetics and purity on the one hand, and medicine, blandness and ugliness on the other.

Two recent studies in Scotland found that dark brown packs evoked particularly negative connotations. In focus groups with young adult smokers in Scotland (Moodie 2011a), dark brown packs were described as horrific and ugly, and associated with excrement dirt, mud, tar and rust. Finally, in focus groups conducted as part of a naturalistic intervention study in Scotland (Moodie 2011b), reported in the previous section, smokers described how the brown packs, which several associated with "*crap*", made them "*feel horrible*" and "*feel bad*" about smoking.

Plain packs weaken attachment to brands

Although brand names still appear on plain packs, the removal of design elements unique to the brand, such as font and colour, appear to reduce the ability of the pack to evoke a distinct brand identity in smokers' minds and to weaken smokers' attachment to their favourite brands. In Moodie and Ford's (Moodie 2011a) qualitative focus group study in Scotland, smokers described feeling disconnected from and less enthusiastic about their own brand when the cigarettes were in a plain pack: *'Everybody has a cigarette they smoke, a brand they like in their own packet. It [plain packaging] takes away the identity of it and makes it a little bit less appealing'.* Similarly, in focus groups with 12-20 year old smokers and non-smokers in Australia (Centre for Behavioural Research in Cancer 1992b), plain packs were perceived to take away a brand's identity: as one participant commented, *"not good – you don't know it's your brand*".

In Gallopel-Morvan and colleagues' (CNCT 2008b) small focus group study in France, a plain pack with the brand name in a standard font had a distancing effect, making it hard for smokers to relate to the packs and appearing to render the brands less authentic: as two participants stated: *'It doesn't look like Marlboro, I don't recognize the writing, neither the brand and the logo. There is no sweetness in the writing"; "It seems false…we don't recognize the brand. The writing is different and it seems to be another brand".*

Plain packs project a less desirable smoker identity

Several qualitative studies suggest that without attractive branding and design elements, plain packs provide smokers with fewer cues for projecting a desirable smoker identity.

Hoek and colleagues (Hoek 2011b) used brand association and symbolic consumption theory to explore in focus groups in New Zealand how smoker identities were perceived and created among young adult smokers and non-smokers. Cigarette packaging was perceived to play a key role in communicating desired identities. However, with plain packaging, the ability of the pack to convey meanings was weakened; as participants explained: *"You haven't got a label to sort of represent [you]"; "For someone who's starting smoking…it'd be a lot harder to identify with a brand if it's just colourless"*. Similar findings were reported in qualitative work with 15-45 year old smokers and non-smokers in France (CNCT 2008a), in which participants described how plain packs would have poor symbolic power for young people seeking to project a positive identity through smoking: "*When young people start smoking, it's not because they feel like smoking but only to do like their friends. I think the plain pack can be a solution for this problem because there will be no more possible*

identification"; "Young people start to give themselves a style, this style is totally broken with the plain pack. It's a really good idea".

Not only did plain packs have less symbolic power to communicate positive smoker identities, they also communicated *negative* identities. When asked to describe people who would smoke cigarettes in regular packaging, Rootman and colleagues' (Rootman 1995) teenage focus group participants in Canada used words with positive connotations, such as fun, popular, cool, with it, good-looking. In contrast, people who would smoke plain pack cigarettes were described as wimpy, boring, buys the cheapest and geeky. Similar contrasting lists were generated in another focus group study conducted as part of a mixed methods study with teenagers in Canada (Centre for Health Promotion 1993), with brand pack smokers being associated with terms such as smart, cool, fun, popular and 'buys the best', and plain pack smokers with terms such as gross, wimpy, boring, loser, unemployed, no life and loser. However, participants also identified a type of plain pack smoker who might choose plain packs to make a positive statement about their independence and lack of concern about social judgments.

Plain packs expose the reality of smoking

A qualitative study in New Zealand (Hoek 2011b) suggested that plain packs would diminish the experience of smoking by stripping away the positive connotations generated by brand imagery and exposing the reality of smoking: *"Oh, stink…I wanna be excited by what I'm gonna smoke"*. Participants described how plain packs made them confront the functional nature of the smoking act and product: "*It looks so boring and…you sort of see the cigarette for what it is…They just look kind of very plain and filthy sorts of things"; "It really brings it down to a kind of drugs level. Like worse drugs".*

Similarly, in focus groups with young adult smokers in Scotland (Moodie 2011a), brown plain packs focused smokers' attention on the act and effects of smoking itself; as one participant described it, *"it doesn't glamorise it and make it cool, it's just back to basics, that's what it is. It's just these sticks in that colour, and it just makes you think, that's what's really happening to your insides".*

4.2.3 Sub-group Differences in Perceptions of the Appeal of Plain Packs

This section reports sub-group differences, where these were examined and reported in the studies, in perceptions of the attractiveness of plain packs. Effect sizes have been calculated by the reviewers for sub-group differences in perceptions of the attractiveness of plain packs, for two variables, smoking status and age (see Section 3.6 above). For other sub-group differences in response, effect sizes are only reported in this section where they were reported in the original study.

Smoking status

Eight studies examined whether there were differences between smokers' and non-smokers' views regarding the attractiveness or appeal of plain packs. In general, the pattern observed is that non-smokers tend to find plain packaging less attractive than do smokers, and smokers to find plain packaging less unattractive than do non-smokers, with this reported in three of the studies. One study found the reverse, but the difference was not significant, and three studies reported no significant differences between smokers and non-smokers in their views of the attractiveness of plain packs specifically. The eighth study did not report sufficient data to calculate whether any differences were significant or to calculate effect sizes.

Moodie and colleagues' (2012) online survey of 10-17 year olds in Scotland identified differences in assessments of the appeal of different types of plain packs by smoking status. Smokers in the study

displayed less negativity than never-smokers on six of the eight items used to rate pack appeal. More than 70% of ever-smokers considered plain packs to be '*unattractive'*, '*uncool'*, and *'not wanting to be seen with them'*, but fewer than half made negative associations in terms of a person smoking from a plain pack. Ever-smokers were significantly less likely than never-smokers to consider plain packs 'unattractive' (*OR* = 0.36, 95%CI = 0.21, 0.63). Non-susceptible never-smokers (95%) were more likely than susceptible never-smokers (85%) to report that they would not like to be seen with the plain pack (p<0.01). Non-susceptible never-smokers were also more likely to perceive a person smoking from a plain pack more negatively than susceptible never-smokers on all four measures used (p<0.001). Similarly, data from Donovan's (Donovan 1993) survey of young and adult smokers and non-smokers in Australia indicate that smokers were significantly less likely than non-smokers to rate standard (plain) packaging as 'unattractive' (*OR* = 0.71, 95%CI = 0.52, 0.98).

In Germain and colleagues' (Germain 2010) survey of Australian 14-17 year olds' perceptions of five types of pack (one branded and four plain packs with various sizes of health warnings), regardless of type of pack shown, established (regular) smokers were reported to have the most favourable perceptions of all the packs (p<0.05) compared with 'non susceptible' non-smokers, 'susceptible' non-smokers and experimenting smokers. Established smokers tended to give more positive pack ratings (across four items ('popular brand', 'attractive', 'value for money', 'exclusive', 'brand would try/smoke') than any type of non-smoker for the plainest packaging (*d* = 1.26, 95%CI = 0.75, 1.76).

In the UK, Hammond and colleagues (Hammond 2011a) found that young women smokers (β=0.09, p=0.007) rated all packs, both plain and branded, as more appealing than did non-smokers, although this difference was not observed specifically for plain packs.

In contrast, in Gallopel-Morvan and colleagues' (Gallopel-Morvan 2011) survey of adults in France, the proportion of smokers rating the plain pack as 'disgusting' rather than 'attractive' was slightly higher than the proportion of non-smokers rating the pack as 'disgusting, but this difference was not statistically significant (OR = 1.18, 95%CI = 0.89, 1.58). In the same survey, the proportion of smokers rating the plain pack as 'does not motivate to buy' was slightly lower than the proportion of non-smokers rating the pack as 'does not motivate to buy', but this difference was not statistically significant (*OR* = 0.79, 95%CI = 0.58, 1.07).

Two studies reported no differences between smokers and non-smokers in views of the attractiveness of plain packs. White (White 2011) compared ratings of 'brand appeal' across 'plain', 'plain, no descriptors', and 'branded' conditions among 16-29 year old women in Brazil. No significant differences were found in how appealing respondents found the packs by smoking status, and no significant 2-way interactions were found between any of the moderators and experimental condition. Similarly, in Hammond and colleagues' (Hammond 2011b) survey of 18-19 year old American women, when participants were asked to select a pack at the end of the study, no significant differences were observed by smoking status in likelihood of selecting plain packs. However, smokers (β=0.13, p=0.001) were more likely than non-smokers to endorse positive smoker traits for both branded and plain packs.

Finally, the Centre for Health Promotion (Centre for Health Promotion 1993) mixed methods study with Canadian teenagers reported findings separately for smokers versus non-smokers on the attractiveness of plain packs, but did not report sufficient data to calculate whether any differences were significant or to calculate effect sizes.

Age and gender

Although the studies conducted with children in this review provide strong evidence of the appeal of different types of cigarette packaging to young people, only four studies directly compared appeal

ratings between adults and children or between age groups. Two of these studies suggested that younger respondents may respond more negatively to plain packs (ie. find them less attractive) than older respondents, and two reported no differences between age groups, although one of these studies only comprised 18-19 year old women. Only one study compared responses by gender, and this suggested that females may be more likely than males to find plain packs unattractive.

Data from Donovan's (Donovan 1993) survey of young and adult smokers and non-smokers in Australia indicate that smoking and non-smoking 11-17 year olds were significantly more likely than 18-29 year olds in the study to rate standard (plain) packaging as 'unattractive' (*OR* = 2.51, 95% CI = 1.71, 3.68).

Gallopel-Morvan and colleagues (Gallopel-Morvan 2011), in their survey of adults in France, reported that those under 25 were more likely than older respondents, and men more likely than women, to indicate that a branded pack when compared with a plain pack contained 'cigarettes of good quality' ($p<0.05$). The study also reported that women were more likely than men to rate plain packs as 'disgusting' rather than 'attractive' ($p<0.01$). It was not possible to calculate effect sizes from the information given in the paper.

White (White 2011) compared ratings of 'brand appeal' across 'plain', 'plain, no descriptors', and 'branded' conditions among 16-29 year old women in Brazil, and reported no significant differences by age, and no significant 2-way interactions between any of the moderators and experimental condition in brand appeal ratings.

In Hammond and colleagues' (Hammond 2011b) survey of American women, when participants were asked to select a pack at the end of the study, no significant differences in the likelihood of selecting plain packs were reported by age, although the sample comprised only 18-19 year olds.

Other socio-demographic differences

Three studies in the review reported differences between subgroups based on other characteristics such as socio-economic status and ethnicity. More data on these types of differences are needed before any conclusions can be drawn.

White (White 2011) compared ratings of 'brand appeal' across 'plain', 'plain, no descriptors', and 'branded' conditions among 16-29 year old women in Brazil, and reported no significant differences by education or ethnicity, and no significant 2-way interactions between any of the moderators and experimental condition in brand appeal ratings.

In Hammond and colleagues' (Hammond 2011b) survey of 18 and 19 year old American women, when participants were asked to select a pack at the end of the study, no significant differences in the likelihood of selecting plain packs were observed for income, education, ethnicity, or weight concerns. Women with greater weight concerns were however more likely to rate packs (branded and plain) as appealing than women with lesser weight concerns (□=0.08, p=0.03). Participants with high-income (□=0.11, p=0.004) and high education (□=0.08, p=0.05) endorsed a greater number of positive smoker traits for packs (both plain and branded) in the study compared to individuals in the low income and low education categories. Non-White respondents were more likely than White respondents to endorse positive smoker traits ((□=0.10, p=0.008).

In the UK, Hammond and colleagues (Hammond 2011a) found that young women who expressed greater weight concerns (β=0.11, p=0.001) were more likely than women with lesser weight concerns to rate packs (both plain and branded) as appealing. Respondents reporting non-white

ethnicity were also significantly more likely than 'white' respondents to rate packs (both plain and branded) as appealing (β=0.11, p=0.001).

4.2.4 Summary

This section of the review outlines findings on how plain packs impact on the appeal of cigarette products, packs and brands. Findings focused on three main elements of appeal: attractiveness, quality, and smoker identity and personality attributes associated with the brand, with key messages from qualitative studies and differences between sub-populations in the studies presented separately.

In terms of attractiveness, 19 studies examined perceptions or ratings of the attractiveness of plain packs (16 cross-sectional surveys, two mixed methods studies including a cross-sectional survey element and one intervention study). All these studies found that plain packs were rated as less attractive than branded equivalent packs, or were rated as unattractive, by both adults and children. Those studies that tested a range of branded and unbranded packs found that this difference increased as progressively more branding elements and descriptors were removed; in other words, the plainer the pack, the less attractive.

Twelve studies (ten cross-sectional surveys, one mixed methods study and one intervention study) examined perceptions of the quality of plain packs in terms of perceived quality, taste, smoothness and cheapness. The studies which compared perceptions of plain and branded packs consistently found that plain packs were perceived to be poorer quality by both adults and children. The study which compared different colours of plain packs, without comparing them with branded packs, found that lighter coloured packs were generally associated with weaker taste.

Thirteen studies examined perceptions of smoker identity and personality attributes associated with plain packs (nine cross-sectional surveys and three mixed methods studies). Plain packs consistently received lower ratings on projected personality attributes (such as '*popular'* and '*cool'*) than branded packs. Visual experiments which measure the strength of association between specific brands and person types found an association between particular brands and smoker identity and saw that this association weakened or disappeared with plain packaging. Studies that looked at whether a pack was perceived to be targeted at particular 'types' of smokers found that plain packs were perceived as being more likely to be smoked by 'older' or 'less fashionable' people than branded packs.

In the ten qualitative studies that examined appeal, four key themes emerged to explain why plain packs were consistently rated as less attractive and lower quality and had a poorer image than branded packs. These were that: plain pack colours have negative connotations; plain packs weaken attachment to brands; plain packs project a less desirable smoker identity, and plain packs expose the reality of smoking.

From the studies which examined sub-group differences in the appeal and attractiveness of plain packs, some patterns emerged. Non-smokers tended to find plain packaging less appealing than did smokers, and younger respondents tended to find it less appealing than did older respondents. Gender differences were examined in one study, which suggested that women found plain packaging less appealing than did men. No consistent differences emerged from the studies which explored differences by ethnicity or socio-economic status.

4.3 Salience of Health Warnings

Key findings:

- Overall, the studies suggest that plain packaging tends to increase the recall of health warnings, the attention paid to them and their perceived seriousness and believability.
- Findings appear to be moderated by the type, size and position of health warning used.
- Only one study examined sub-group differences, and reported that non-smokers and weekly smokers may pay more attention to warnings on plain packs than daily smokers.

Twelve studies examined whether plain packs increase people's ability to notice and recall the health warnings on packs or whether plain packs affect the perceived seriousness and believability of the warnings. Three were cross-sectional surveys, and three were mixed methods studies involving quantitative and qualitative elements. One study was a naturalistic intervention in which smokers used a plain pack and their own branded pack for two weeks each in everyday settings, and five studies used primarily qualitative methods. The study populations comprised adults and young people in Australia, Belgium, Canada, France, New Zealand, the UK and the USA.

4.3.1 Quantitative Studies

Seven studies using quantitative methods examined the potential impact of plain packaging on recall of, attention to, believability and seriousness of health warnings. Three were cross-sectional surveys, and three were mixed methods studies involving quantitative and qualitative elements. One study was a naturalistic intervention in which smokers used a plain pack and their own branded pack for two weeks each in everyday settings.

The directions of effect are shown in Table 4.3. 'Favours plain packs' means that plain packaging increases the salience of health warnings in terms of recall, attention, believability or seriousness. There is some heterogeneity in the directions of effect with four out of the seven studies suggesting that plain packaging increases the salience of health warnings, one study finding no difference, and two finding mixed results. The overall burden of the directions of effect appears to be in favour of plain packaging, however.

Table 4.3: Directions of Effect: Salience of health warnings

Study	Type of Comparison	Salience of health warnings
Beede 1990	Branded vs. plain	Favours plain packs (recall of warnings)
Gallopel-Morvan 2010b	Branded vs. plain	Favours plain packs (recall of warnings)
Germain 2010	Branded vs. plain	No difference (recall of warnings)
Goldberg 1995	Branded vs. plain	In aided recall exercise: favours branded pack for two health warning messages; in unaided recall exercise, favours plain pack for one health warning message (recall of warnings)
Moodie 2011b	Branded vs. plain	Favours plain packs (noticing, seriousness, believability)
Munafò 2011	Branded vs. plain	Favours plain packs for non smokers and weekly smokers (attention towards warnings)
Rootman 1995	Branded vs. plain	In Ontario: favours plain packs for regular smokers. In Chicago: no difference (recall of warnings, seriousness of warnings)

Studies measuring recall of warnings

Five of the studies measured recall of warnings on packs. In New Zealand, mixed methods research with young people assessed unaided recall of information on branded and plain cigarette packaging (Beede 1990). Using focus groups, participants were shown and discussed three packs from one of the following groups: branded and plain packs from New Zealand (familiar brands) and branded and plain packs from the US (unfamiliar brands). Participants were then asked to recall as much information about the packs they had been previously exposed to using 'package response' forms on which to record this information. All package response forms were collated, quantified and analysed. Recall for the health warnings was greater for plain packs (74.0%) than branded packs (63.8%). Recall was higher for warnings on plain packs compared to branded packs each time, although only significantly so for the second ($p=0.03$) and third ($p=0.001$) packs recalled. Recall for both branded and plain packs was found to be higher for familiar packs from New Zealand (79.4% branded; 82.3% plain) than for the unfamiliar packs from the US (45.2% branded; 65.0% plain). The researchers explain that as the participants exposed to the plain packs had less information to process, they were more likely to remember the health warning than those exposed to branded packs as they had to process extra stimuli, such as logos and colours.

In a cross-sectional survey in France (Gallopel-Morvan 2010b), young adult smokers and non-smokers were randomly exposed to a picture of one of four cigarette packs; either a branded Marlboro pack, or a white, grey or brown plain pack with Marlboro printed in a standardised black font in the centre of the pack. Participants were asked, unaided, to explain what they saw first when looking at the pack, either the brand name or health warning. Compared to the branded pack condition, it was found that in the three plain pack conditions the health warning was significantly more prominent ($p<0.001$), with the brand name significantly less prominent ($p=0.023$). No significant differences were found across the plain pack conditions in respect to the prominence of the health warning or brand name.

In a recall experiment conducted as part of a mixed methods study in Canada (Goldberg 1995), teenage participants were presented with pictures shown on a computer screen of four items (including a cigarette pack). Participants were exposed to each image for four seconds, and after seeing the first picture were asked to recall from the picture all the information they could. Direct questioning was then used to assess recall of presence and content of the warning message. The process was then repeated with a second and third picture. Each participant was exposed to only

one cigarette pack type (plain white or branded pack) for each of three brands used in the study. Participants were more likely to match the correct warning message to the branded pack than to the plain pack ($p<.0001$), at least for two of the three warnings: 'Smoking can kill you' and 'Tobacco smoke causes fatal lung disease for non-smokers'. The authors suggest the brief exposure time may have contributed to these findings. In the unaided recall exercise, recall for the 'Smoking can kill you' warning was 22% for the branded pack and 56% for the plain pack ($p<0.001$). No analyses were conducted on the other two warnings ('Cigarettes are addictive' and 'Tobacco smoke causes fatal lung disease') because recall was very low (Goldberg 1995). A later analysis of the findings conducted in 1999 showed that recall for the 'Cigarettes are addictive' warning was 13% for the branded pack and 27% for the plain pack ($p=0.06$), whereas recall of the 'Tobacco smoke causes fatal lung disease in non-smokers' warning was only 1% for the plain pack and 15% for the branded pack ($p<0.05$). However, there were very low levels of recall for these last two warnings (4% and 3% respectively, compared to the 44% recall rate for the 'Smoking can kill you' warning), which prohibited meaningful analysis.

One cross-sectional survey in Australia tested recall of health warnings on two plain packs, rather than between a plain pack and a branded pack, and did not find any differences in recall (Germain 2010). The study explored recall on a branded pack and three increasingly plainer packs (plain pack 1: plain with brand name in same font size and style as a branded pack; plain pack 2: plain and with brand name standardised in centre of pack; plain pack 3: plain and with brand name standardised but in a smaller font and at the bottom of the pack). All packs had an identical pictorial warning covering 30% of the pack. A fourth plain pack, identical to plain pack 3 but with the warning covering 80% of the pack surface, was also used. Participants viewed only one of these packs and were asked to recall the health warning on it. Comparing only plain packs 3 and 4 (identical packs but with either 30% or 80% warnings) no effect on health warning recall was found. Overall, 58% of the sample correctly recalled the pictorial health warning and this did not vary by pack condition ($p>0.10$). The authors suggest that the use of a warning which had been in circulation on the Australian market for several years may explain the finding. That quite a shocking image (a gangrenous foot) was employed may also have contributed to high recall.

As part of a mixed methods study (Rootman 1995), young people in Ontario and Chicago were shown a branded cigarette pack for one minute and then asked what they could remember about it. Recall of the health warning in Chicago was 6% (warning on the side of the pack in the US) compared to 83% in Ontario (warning on the front of the pack in Canada). Recall of the health warning on plain packs was also assessed. In Ontario, participants were almost twice as likely to report that it was easier to see health warnings on a plain pack (51%) than on the branded pack (29%). Recall of the warning was improved by plain packaging, but only for regular smokers; 82% of daily smokers remembered the warning on the plain pack compared to 62% for the branded pack (significance values were not reported). No differences in recall were found in the Chicago sample. The authors suggested that this was because warnings on the Canadian packs were more prominent than those on packs from the USA. The survey also measured young people's perceptions of the seriousness of warnings on plain packs, and reported that 53% of participants said that the plain pack made the health warning look more serious, compared to 19% who said that the branded pack made it look more serious.

Studies measuring other responses to warnings

In Moodie and colleagues' (Moodie 2011b) naturalistic intervention study, adult smokers in Glasgow, Scotland, were asked to use plain packs for two weeks and to complete two questionnaires per week for four weeks to capture their reactions to, among other things, health warnings. The items used to assess response to health warnings measured noticing, seriousness and believability of warnings. Of the 140 people recruited into the study, only 48 (34%) completed all the questionnaires and used

the correct packs. At the first and second measure, completers reported that in comparison to the branded packs, warnings were more noticeable on the plain packs ($p<0.05$). Warnings were also found to be more serious on the plain packs at the fourth measure ($p<0.001$). No differences between branded and plain packs were found in respect to believability. Overall ratings of the warnings did not differ between the packs and did not vary across time. The relatively low sample recruited at baseline and high drop-put rates means that the study suffers from attrition bias.

Finally, a cross-sectional survey (Munafò 2011) conducted with adults in the UK measured eye movements (saccades) towards images of branded and plain cigarette packs, each presented for 10 seconds on the centre of a computer screen, to explore whether plain packaging, in comparison with branded packaging, increased visual attention towards the warnings. Ten different randomly selected pictorial health warnings from those in use in the UK were paired with each of the 10 branded and 10 plain packs, to create a total of 200 images. Participants were asked to look at a series of 20 images, randomly selected from this total set of 200 images, comprising 10 branded and 10 plain packs, which used 10 different health warnings, each presented twice (once on a branded pack and once on a plain pack). It was found that plain packs, in comparison to branded packs, lead to more saccades towards the warnings among non-smokers ($p=0.001$) and weekly smokers ($p=0.001$). This effect was not observed for daily smokers ($p=0.35$).

4.3.2 Qualitative Studies

Six studies (four focus group studies, one interview study, and an intervention study which included interviews) used qualitative methods to explore the impact of plain packaging on health warnings. In all the studies apart from the intervention study, participants were shown at least one branded and one plain pack and asked for their reactions towards the packaging. Some studies directly asked about the impact of plain packaging on health warnings, while others explored perceptions of the packaging more generally but included comments made in respect to the pack warnings.

Two themes emerged from the qualitative studies to explain why the warnings on plain packs were mostly perceived as more salient, believable and serious than warnings on branded packs:

- Devoid of all branding except brand name, plain packaging has less 'clutter' on the pack to distract from the warning.
- The dullness of plain packaging enhances the seriousness and believability of the warning.

In the naturalistic intervention study (Moodie 2011b) conducted with adult smokers in Scotland, the researchers interviewed 18 participants after the main component of the study, which involved the use of plain packs in real world settings, to gather participants' views about their experiences of using the plain packs. Twelve smokers thought that there was no difference between the plain and branded packs in terms of salience, believability and seriousness. Six thought the warnings were more salient on the plain pack, five more believable and four more serious. Among the third of the post-study interview sample that did consider the warnings more salient, comments included: *"With the lack of advertisement, the health warning is the only thing you really notice on the packet. That stands out"; "You notice them more because there is nothing else on the packaging for the eye to go to. I think because you notice them more, I think it tends to make you think about it a bit more"*.

Focus group research in Australia (Centre for Behavioural Research in Cancer 1992b) explored the reactions of 12 to 20 year olds to four cigarette packs, all modified to show a more obvious health warning, more detailed information on health risks and revised contents labelling. Among the packs shown were three plain packs. For all four packs participants were asked 'What do you notice about

the packs' and what their first impressions were. For the first pack, the branded pack, the new warning on the front (Smoking causes lung cancer) was considered 'huge' and most participants reported that they would read the additional information (about harms associated with smoking and help available) on the reverse panel. For the three plain packs (each displaying the same warnings and information as on the branded pack) they were perceived unfavourably (eg. boring or unattractive) and one comment in respect to the plain packs was that 'you only look at the warning'. This would suggest that for this individual plain packaging was considered to increase the salience of the warning; however, overall this study provides little information on the ability of plain packaging to increase the salience of health warnings or the attention paid to them.

In France, adult smokers, ex-smokers and non-smokers were shown a branded Marlboro pack and a grey plain pack with Marlboro printed in a standardised black font in the centre of the pack. They were asked which of the two packs allowed them to see the health warnings most clearly (CNCT 2008a). Some participants indicated that warnings are already visible on branded packs: *"In spite of all the colours on the current pack, we can see distinctly the warning"*. However, for others the plain pack seemed to help strengthen the warnings, in terms of making it more visible and increasing attention paid to it: "It's possible that people pay more attention to the warnings on the grey pack. It can be a good idea"; *"I think the warning on the grey pack is a good idea because we only see that"*.

Another study in France (CNCT 2008b) used in-depth interviews to assess smokers and non-smokers (aged 17-64) perceptions of two branded and two plain packs (each branded and plain pack carried either text only warnings only on both pack faces, or a text warning on the front and pictorial warning on the back). Each of the four packs was presented individually with participants asked what they saw first on each pack. For the first pack (branded with text only warnings) some comments suggested that warnings were visible on branded packs: *"It's obvious that I pay attention to these health warnings"*. For the second pack (plain with text warnings), the warning was seen first by most participants. Half of the interviewees mentioned that the risks associated with smoking were clearer because the warning was more visible: *"On this pack, we see 'Smoking kills' so it's really scary"*. For the branded and plain packs which included a pictorial warning on the pack (packs 3 and 4), most participants reported seeing the pictorial warning first when looking at the packs, with these images judged to be more effective than text warnings on plain packs. For the plain pack with the pictorial warning this was considered "*better than P2 (plain pack with text warnings) because this picture represents a disease which is the consequence of tobacco consumption. There is no fun but it's a really clear warning, clearest (sic) than a textual warning"*. Other comments similarly suggest that plain packaging increased the seriousness of the message; *"It's a direct message. It's like we take a cigarette and we die immediately. The grey colour looks like the cards we receive when there is a mourning announcement… It's really shocking"*.

The four packs were then presented together and then participants were asked to compare them. When comparing the two packs with the text warnings, the plain pack was found to enhance the visibility of the warning for 18 of the 20 interviewees. Similarly, when comparing the two packs with the text/pictorial warnings, 14 of the 20 interviewees reported paying more attention to the warning on the plain pack. For instance, comments for the packs with the pictorial warnings included the following: *"Given that there is nothing except the warning on the pack, we can see the message fastly [sic]".*

A third qualitative study in France (Gallopel-Morvan 2010a) evaluated young people's and adults' perceptions of branded and plain grey packs displaying different sizes and types of warnings. One branded and one plain pack displayed text warnings covering 30% of the pack front and a pictorial image covering 40% of the reverse panel. The second branded and plain pack had pictorial warnings on both panels, covering at least 50% of the surface area. Health warnings were reported to be more

prominent on the plain packs, which were reported to look poisonous and dangerous (17 comments made by 8 individuals). For example, in respect to the plain pack with pictorial warnings on both faces, one participant mentioned: *"It's like holding something that's toxic, I mean, you sort of pick it up reluctantly even, the grey plain packs with the 'throat' images and the doctor, it's an uneasiness that really gets under your skin"*. The study reports that approximately a third of respondents felt that, irrespective of appearance, no pack would be effective in motivating quit behaviours in smokers ("*That's not what makes people stop smoking*"). However, some respondents felt that any pack, whether plain or branded, could motivate cessation if it featured a graphic pictorial warning. The authors suggest that as France had not introduced pictorial warnings at the time of the study, this may explain why participants felt that a graphic warning was particularly effective, regardless of whether the pack was plain or branded.

In Belgium, van Hal and colleagues (van Hal 2011) explored in focus groups young people's responses to plain and branded packs and the use of pictorial warnings on packs (unlike in France, pictorial warnings have been used in Belgium). Analysis of the data is limited, but respondent quotes are included which suggest that the warning was more noticeable on a plain white pack - *"I found that, with all that white, the health message was much clearer: smoking kills"* and potentially more believable: *"Yes, the message 'smoking kills' and then on the back the picture… The message arrests the attention much more on the white package. I don't know why but it certainly was the case. I mean, you would more believe the message on the white package"*.

4.3.3 Subgroup Differences in the Impact of Plain Packs on Salience of Health Warnings

This section examines sub-group differences, where these were examined and reported in the studies, in the impact of plain packs on the salience of health warnings.

Smoking status

One study compared reactions to warnings on plain packs by smoking status. Munafò et al (Munafò 2011) measured the number of eye movements (saccades) towards health warnings as participants were shown both plain and branded packs, as a measure of visual attention. The analysis included the variable of smoking status, with the categories: non-smoker, weekly smoker and daily smoker. It was found that plain packs, in comparison to branded packs, lead to more saccades towards the warnings among non-smokers (p=0.001) and weekly smokers (p=0.001) – meaning that these groups spent longer looking at the health warning when it appeared on a plain pack as compared with a branded pack. This effect was not observed for daily smokers (p=0.35), leading the authors to conclude that plain packaging may have a bigger impact on people who do not smoke, those who are experimenting with tobacco, and those who are irregular smokers.

Other sub-group differences

No studies examined sub-group differences in the impact of plain packs on salience of health warnings by age, gender or other variables.

4.3.4 Summary

This section of the review outlined findings on how plain packaging impacts upon the salience of health warnings, in terms of recall, attention, seriousness and believability.

Twelve studies (three cross-sectional surveys, three mixed methods studies, one intervention study and five qualitative studies) examined whether plain packs increase people's ability to notice and

recall the health warnings on packs or whether plain packs affect the perceived seriousness and believability of the warnings. One of the survey studies measured eye movements to measure visual attention to packs, while the other survey and mixed method studies briefly showed participants different plain and branded packs and then asked them what they recalled, using either unprompted or prompted measures or both.

Of the seven studies which statistically compared responses to warnings on plain packs and branded packs, four studies suggested that plain packaging increases the salience of health warnings, one study found no difference, and two found mixed results. The impact of health warnings appeared to be influenced by the size, type and position of the warnings used in the studies. One study which recorded eye movements as an indicator of attention paid to warnings suggested that non-smokers and weekly smokers paid more attention to warnings on plain packs than did daily smokers. No study examined gender, age or other socio-demographic differences.

From the qualitative studies, two themes emerged: that plain packs were perceived as having less 'clutter' on them to detract from the health warning, and that the dullness and seriousness of the packs enhanced the seriousness and believability of warnings.

4.4 Perceptions of Product Harm and Strength

Key findings:

- Plain packaging can reduce misperceptions about the relative harmfulness of different brands.
- Colours of packs affect perceptions of product harm and strength. In general, plain packs are perceived as more harmful than branded packs if in a darker colour such as brown and, conversely, less harmful than branded packs if in lighter colours such as white. Red packs are perceived to contain stronger cigarettes than light-coloured packs.
- Use of descriptors such as 'gold' or 'smooth' on plain packs have the potential to mislead consumers, as they do on branded packs.
- In general, smokers are more likely to have misperceptions about the harmfulness of packs, both branded and plain, than non-smokers.

Sixteen studies examined whether and how plain packs impact on the perception of the harm and strength of cigarette products, packs and brands. Thirteen were cross-sectional survey studies, while two were qualitative research studies and one a naturalistic intervention study. The study populations comprised adults and young people in Australia, Brazil, Canada, France, the UK and the USA.

Perceptions of harmfulness and strength were assessed in several ways, by asking respondents which packs of those shown: would deliver the most tar and/or nicotine or would be 'lighter' in tar; were a greater risk to health compared to other brands; would be associated with greater or lesser harm; would trigger discussions on harmfulness; inform the smoker about the health effects; and would be more likely to make you think that the cigarettes inside were dangerous. Perceptions of

harm also included questions on which packs you would purchase if trying to reduce the risks to health or which were perceived as 'easier to quit'. From a public health perspective, all conventional cigarettes pose a similar health risk; smokers can alter the way they smoke cigarettes of different tar and/or nicotine machine-measured yields in order to compensate for differences and satisfy their nicotine addiction. In addition there is no evidence that brands differ in ease of quitting. As brightly coloured and attractive branded packs can reduce perceptions of the harmfulness of cigarettes, the desired outcome of these studies is that plain packs should be perceived as equally harmful as, or more harmful than, branded cigarettes, and plain packs should be seen as equally easy to quit as branded cigarettes or harder to quit.

4.4.1 Quantitative Studies

Fourteen studies used quantitative methods to examine the impact of plain packs on participants' perceptions of the harmfulness and strength of plain and branded packs. Thirteen were cross-sectional studies and one was a naturalistic intervention study. Packs were assessed individually and compared with other brands on the market, or compared with other packs which were shown to participants.

Directions of effect for perceptions of harm and strength are given in Table 4.4. Because a wide range of harm perception outcomes were examined in the studies, we have summarized findings under three headings: perceptions of tar and/or nicotine levels, perceptions of harmfulness, and which pack would be 'easier to quit'. Where 'favours branded packs' is stated for perceptions of tar and/or nicotine levels, this means that respondents believed that the cigarettes in the branded pack(s) yielded greater levels of tar or nicotine than those in the plain pack(s); where 'favours plain packs' is stated, this means that cigarettes in the plain pack(s) were perceived to yield greater levels of tar or nicotine. Where 'favours branded packs' is stated for perceptions of harmfulness, this means that respondents believed that the cigarettes in the branded pack(s) were a greater risk to health, were more harmful, were more likely to trigger discussion on harmfulness, inform the smoker about the health effects or were more likely to make respondents think that the cigarettes were dangerous than those in the plain pack(s); where 'favours plain packs' is stated, this means the reverse. The final column indicates the direction of effect for which type of pack was perceived as 'easier to quit'.

As noted above, the desired outcome from a public health perspective is that all packs should be perceived as equally harmful, or that plain packs should be perceived as more harmful than branded cigarettes. As Table 4.4 shows the findings were mixed as perceptions varied according to the colour of the plain pack. In general, darker coloured plain packs were seen as more harmful, and lighter coloured plain packs less harmful, than branded cigarettes. This indicates that misperceptions about the relative harmfulness of cigarettes were reduced when darker coloured plain packs were shown.

Table 4.4: Directions of Effect: Perceptions of strength, harmfulness and which packs are easier to quit

Study	Type of comparison	Perceptions of tar/nicotine levels and/or lighter taste	Perceptions of harmfulness	Easier to quit
Bansal-Travers 2011	Branded vs. plain (white)	Favours branded packs	No difference (which buy to reduce health risks)	
Doxey 2011	Branded vs. plain (white)	No difference	No difference (health risks compared to other brands)	
Environics Research Group 2008a	Branded vs. plain (colour not given)		Favours plain packs (informs about health effects)	
Environics Research Group 2008b	Branded vs. plain (colour not given)		Favours plain packs (informs about health effects)	
Gallopel-Morvan 2010b	Branded vs. plain (brown, grey and white)	Favours branded packs (Branded vs. plain white and grey). Favours brown plain pack (plain brown vs. plain white and plain grey)		
Gallopel-Morvan 2011	Branded vs. plain (grey)		Favours plain pack (discussion of and awareness of dangers)	
Germain 2010	Branded vs. plain (brown)	No difference (main effect of 3 plain pack vs. branded packs for 3 different brands; light taste) Favours plain packs (for 2 out of 3 plain pack images for one brand comparison only)		
Hammond 2009	Branded vs. plain (white)	Favours branded pack	Favours branded pack (health risks)	Favours branded pack
	Branded vs. plain (brown)	No difference (three comparisons); favours plain packs (one comparison)	No difference (two comparisons); favours plain packs (two comparisons) (health risks)	No difference
	Plain with descriptors vs. plain without descriptors, multiple comparisons	Favours plain pack without descriptors (Plain white and plain brown with descriptors vs. plain white with descriptor 'Smooth' and plain brown with descriptor 'Gold')	Favours plain pack without descriptors (Plain white and plain brown with descriptors vs. plain white with descriptor 'Smooth' and plain brown with descriptor 'Gold') (health risks)	Favours plain pack with descriptors (Plain white and plain brown with descriptors vs. plain white with descriptor 'Smooth' and plain brown with descriptor 'Gold') (easier to quit)
Hammond 2011a	Branded vs. plain (brown)	Favours plain packs	Favours plain packs (health risks)	
Hammond 2011b	Branded vs. plain (brown)	Favours plain packs	Favours plain packs (health risks)	
Moodie 2011b	Branded vs. plain (brown)		No difference (awareness of health risks)	
Moodie 2012	Plain packs of different colours		Favours red plain packs (level of harm)	
Wakefield 2008	Branded vs. plain (brown)	Favours plain packs		
White 2011	Branded vs. plain (brown) with and without descriptors		Favours plain packs (harmfulness) Favours packs (branded and plain) without descriptors (harmfulness)	Favours packs (branded and plain) with descriptors (easier to quit)

Because several different measures of the perception of harm were assessed in most studies, and the colour of the plain pack used in the studies seemed to be important, we present the findings for each study in turn rather than presenting findings by theme. We also present the studies according to whether they were focused on adult or youth participants

Studies with adults

Bansal-Travers and colleagues (Bansal-Travers 2011) recruited 397 smoking and non-smoking adults into a mall-intercept study in the US. Twelve fictitious packs were rated in pairs (the packs could be picked up): only one pair included a plain pack. In this comparison one branded pack (red Mayfair) was compared with a plain white pack with no colour or brand imagery (all packs displayed the current US text–based health warning on the side of the pack). Participants were asked which pack they would expect to deliver the most tar if they were to smoke it and if you had to choose between these two packs, which one would you buy if you were trying to reduce the risks to your health? The branded packs were significantly ($p<0.001$) more likely to be selected as delivering the most tar. There was no difference in selecting plain or branded packs when asked which pack they would buy to reduce health risks. The authors suggested that the use of white in the plain packs may have accounted for some of these findings.

Doxey and Hammond (Doxey 2011) recruited 512 18-25 year old women into an online study examining plain and branded cigarette packaging in Canada. The participants viewed eight cigarette packages, one at a time, according to each of four experimental conditions: (1) female-oriented packages; (2) female-oriented packages with brand descriptors removed; (3) female-oriented packages without descriptors and with the colour and brand imagery removed (plain packages with a white background); (4) leading Canadian cigarette brands without any overtly feminine characteristics. All packages in the study displayed the same pictorial health warning covering 50% of the principal display surface, in accordance with Canadian regulations. Plain packs (condition (3) were of white background colour, generic black font (brand name and number of cigarettes) and the same shape/size of container as original. Participants were asked how much tar they thought these cigarettes would have compared to other brands on the market and how the health risks of these cigarettes compared to other brands on the market. They observed few differences across the conditions in the perceived tar yield and health risk ratings for individual packs. No significant main effects were observed for plain packs. Similar to the previous study, the authors thought that the use of white plain packs and the lack of a visible concrete comparator (rather than 'other brands on the market') might explain these findings.

A survey of 826 18 and 19 year old American women conducted by Hammond and colleagues (Hammond 2011b) rated eight packs from one of four conditions: compared standard female packs, standard female packs with no descriptors, plain brown packs and branded non-female packs. They found that a significantly greater proportion of respondents agreed that the branded packs had less tar than other brands on the market, than agreed that plain packs had less tar than other brands, for two out of eight individual packages. In a linear regression analysis using the index variable across all eight packs, a significant main effect of condition was found ($p<0.001$), such that branded packs were more likely to be rated as having significantly less tar than plain packs ($p=0.004$). Similarly, a significantly greater proportion of participants agreed that branded packs had lower health risks compared with those agreeing this for plain packs for two of the eight individual packages. In a linear regression model using the index score across all eight packs, a significant main effect of condition was observed ($p = 0.007$): packs in the branded condition were more likely to be rated as lower health risk than plain packs ($p=0.08$). Again, brown coloured plain packs were associated with greater harm compared to branded packs.

A survey of 836 adults (Gallopel-Morvan 2011) in France, compared perceptions of a current red Marlboro pack and a plain grey pack. The plain pack was perceived as significantly ($p<0.01$) more likely than the current pack 'to trigger discussions on the dangers of tobacco' and 'to make people think that the cigarettes inside were dangerous'.

In an Australian study (Wakefield 2008) a sample of 813 adults (18-49 years) were invited to participate in an online survey in which they were randomly shown one pack image from a possible 12 packs (using a 3 by 4 design: 3 brands, 4 different types of packaging). The four different packaging images were: original brand; plain pack 1, a generic cardboard brown pack maintaining a branded font and positioning of brand/descriptor; plain pack 2, a generic cardboard brown pack with brand name in a standard font in a prominent position on the pack with descriptor information in a standard font at the bottom; and plain pack 3, a generic cardboard brown pack with the brand name in a smaller standard font positioned at the bottom with the number of cigarettes in a larger font in a prominent position on the pack. Plain pack 2 differed from plain pack 1 by having its brand name in a standard, rather than a branded font, and in plain pack 3, the brand and variant name was still present but in smaller standard font. All displayed graphic health warnings on the top of the fact of the pack as required by Australian government law. Compared with those who viewed the original pack, fewer smokers who viewed plain pack 2 thought the cigarettes would be low in tar and nicotine ($p<0.05$). Compared with those who viewed the original pack, fewer smokers who viewed plain pack 3 thought the cigarettes would be low in tar and nicotine ($p<0.05$). Again, the brown colour was associated with greater harm, but only when descriptors were removed.

In a Brazilian online survey of 640 16 to 26 year old females smokers and non-smokers (White 2011), participants were randomly assigned to one of three conditions: Condition 1 involved the usual brand; Condition 2 involved plain mid-brown coloured plain packs with descriptors but no imagery; and Condition 3 involved plain mid-brown packs with no descriptors and no imagery. Respondents rated packs individually (10 packs one at a time) or when shown in comparison pairs (two packs from each of five brand families for conditions 1 and 2 only). Health risk was assessed by the question 'Which brand do you think would be less harmful?' and for the paired comparisons, respondents were also asked 'Which brand would make it easier to quit smoking?'. In the individual ratings, in general, branded packs were seen as less harmful than plain packs. In the paired comparisons, regardless of condition (plain or branded), there were consistently a greater number of people who rated the 'lighter' pack (as designated by the researchers according to descriptor information) less harmful and easier to quit than the 'regular' pack. Plain packaging did not impact on the proportion of participants who indicated that there would be 'no difference' between the two packs in terms of health risk or ease of quitting. This suggests that the use of descriptors on plain packs can result in misperceptions of harm and strength even when other pack elements are removed.

In Moodie and colleagues (Moodie 2011b) 'naturalistic intervention' study, in which young adult smokers were asked to use plain packs for two weeks, participants were asked to fill out questionnaires at eight time points (two questionnaires per week for four weeks) to capture their reactions to, among other things, health risks. There was one item related to harm, which asked 'How did the pack you used today make you feel about smoking' with the response measured on a five-point scale ranging from 'Very aware of the health risks' to 'Not at all aware of the health risks'. No differences were found between the plain and branded packs. The study does suffer attrition bias.

Adults and young people

Two quantitative studies carried out by Environics (Environics Research Group 2008a and b) in Canada with young people and adults found that participants were more likely to think plain packs were more effective than branded packs in informing about the health effects of tobacco. The

survey methodologies were the same with 1000 in the adult and 1000 in the youth (12-18 years) surveys; however, only adult smokers were involved whereas youth non-smokers and smokers were included, in proportion to the prevalence of smoking in the youth population. Reactions of participants were explored in response to mock-up cigarette packages prepared for research purposes. Plain and branded packs were compared with different sizes and content of health warnings. The results can be seen in Table 4.5 below – when the size and content of the health warnings was standardised, both adults and youth were more likely to report that the plain packs informed them of the health effects of tobacco than reported this for the branded packs.

Table 4.5: Environics (Environics Research Group 2008a and b) perceptions of which pack most effective at informing about health effects of tobacco

	50% warning: branded	50% warning: plain	Both equally effective	Neither	75% warning: branded	75% warning: plain	Both equally effective	Neither
Youth	25%	50%	21%	3%	26%	52%	19%	3%
Adults	20%	48%	25%	7%	19%	50%	25%	6%

In a street-intercept survey of 540 15-25 year olds in France (Gallopel-Morvan 2010b), participants were randomly exposed to one of four pictures of cigarette packs; either a branded Marlboro pack, or a white, grey or brown plain pack with Marlboro printed in a standardised black font in the centre of the pack. All packs had the text warning 'Fumer Tue' (Smoking Kills) covering 30% of the front panel of the pack, consistent with the size of warnings in France. The grey and white plain packs were perceived as containing significantly 'lighter' cigarettes than the branded pack ($p<0.001$) (in the study, 'lighter' appeared to combine both lower tar and lighter tasting). Compared to the brown pack, both the white and grey plain packs were considered to contain lighter cigarettes ($p<0.001$). This study suggests that using a brown coloured plain pack reduces misperceptions about relative harms compared to using white or grey packs.

Hammond and colleagues (Hammond 2009) in their online survey of 516 adult smokers and 806 youth in the UK assessed pairs of packs on a number of relevant dimensions. They were asked which brand they thought had the most tar and which they would buy if they were trying to reduce the risks to their health and 'which brand do you think would make it easier to quit smoking?' (adult smokers) or 'if you were to try smoking, which one of these brands would you use?' (youth – we include this here as potentially covering perceptions of strength although this might also reflect attractiveness). Respondents could select either of the two packs or a 'neither/no difference' option. There were six paired comparisons that were relevant to this report: comparison 9 (Mayfair King Size plain white pack vs. branded Mayfair King Size); comparison 10 (Mayfair King Size plain brown pack vs. Mayfair King Size branded); comparison 11 (plain white with words Mayfair and Smooth in small black font vs. plain white with words Mayfair and King Size in small black font); comparison 12 (Lambert & Butler plain white pack vs. Lambert & Butler King Size branded); comparison 13 (Lambert & Butler plain brown pack vs. Lambert & Butler King Size branded); comparison 14 (plain brown with Lambert & Butler and Gold in small black font vs. plain brown with Lambert & Butler and King Size in small black font). Hence, comparisons 9 and 12 used branded packs vs. white plain packs, comparisons 10 and 13 used branded packs vs. brown plain packs and comparisons 11 and 14 compared the same coloured plain packs but with alterations in the wording (11 compared white packs and the addition of the word 'smooth'; 14 compared brown packs and the addition of the word 'gold').

There were differences in perceptions of plain packs depending on the colour. For adult smokers, plain white packs were perceived to be less harmful and easier to quit (eg. Mayfair plain white pack in comparison 9 was perceived by significantly more adult smokers as lower tar ($p<0.001$), lower

health risk (p<0.001) and easier to quit (p<0.001) than its branded counterpart). The same significant findings were found for comparison 12 and the Lambert & Butler comparisons with the white plain pack. In contrast, the Mayfair plain brown pack in comparison 10 was perceived to have no significant differences in tar level or health risk or ease of quitting compared with the branded version. Similarly, the plain brown version in comparison 13 (Lambert & Butler) was rated as higher tar (p=0.02) and greater health risk (p=0.005) than the branded version, with no difference in the ease of quitting. The findings were similar for youth although both brown and white packs were less likely to be chosen if trying smoking than the branded version. For the Mayfair brand pair in comparison 9, the plain Mayfair white pack was rated by youth as lower tar (p<0.001) and lower health risk (p=0.005) and significantly less likely to be the preferred brand if they were to try smoking (p<0.001), than the branded version. Similar findings were observed among youth for the second brand pair, Lambert & Butler King Size. In contrast, in comparison 10, there were no significant differences in how the brown plain pack was rated by youth in comparison with the branded pack in tar level or health risk and it was less likely to be selected for trying smoking (p<0.001). Similarly, the brown version in comparison 12 was rated as higher risk (p=0.001), less likely to be selected for trying smoking (p<0.001) among youth than the branded pack with no difference in tar level.

The plain packs were also used to examine the perception of text descriptors in isolation from other aspects of branding. When shown two plain white packs in comparison 11, adult smokers rated the pack with the word 'Smooth' as significantly lower tar and lower health risk and easier to quit smoking (p<0.001 for all). When shown two plain brown packs in comparison 14, adult smokers were significantly more likely to rate the pack with the word 'Gold' as lower tar (p<0.001) and lower health risk (p<0.001) and easier to quit (p<0.001). The same pattern of results was observed among youth for comparison 11 and comparison 14 (p<0.001 for all). When comparing results between the plain white Mayfair packs in comparison 11 with the corresponding branded packs in comparison 2 (when Mayfair smooth was compared with Mayfair KS), significantly fewer adult smokers perceived the plain packs as having differences in tar delivery, health risk and ease of quitting (p<0.001 for all). The same pattern was true when comparing the plain brown packs in comparison 14 with their branded counterparts in comparison 3 (when Lambert & Butler Gold was compared with Lambert & Butler KS) (p<0.001 for all). The same results were found for youth (p<0.001 in all cases). Overall, these findings indicate that brown is better than white for plain packs, as white is generally associated with lesser harm for both youth and adults. The use of descriptors such as 'smooth' can still mislead on plain packs, although not as much as when they are on branded packs.

Young people

A survey of 14-17 year old male and female smokers and non-smokers in Australia (Germain 2010) found that cigarettes in plain brown packs were not perceived as being 'lighter tasting' (incorporating two factors: 'be like a light cigarette' and 'be low in tar and nicotine') than those in branded packs. An interaction effect indicated that ratings of 'light taste' differed significantly (p<0.01) across pack conditions for one brand only (Longbeach brand where two of the plain packs (out of a possible four) were rated as less 'light tasting' compared to the branded pack (p<0.01).

In a study of 16 to 19 year old UK women (Hammond 2011a), pack images were displayed in random order according to each of the four experimental conditions: 1) female-oriented packages; 2) female-oriented packages with brand imagery, including colours and graphics, but with descriptors (ie. "slims") removed; 3) female-oriented packages without brand imagery and descriptors (ie. "plain" packages in a mid-brown colour); and 4) popular UK brands of "regular" or non-female oriented packages. Only the comparisons with plain packs are considered here. Branded packs were more likely to be rated as having significantly (p=0.013) less tar than packs in the plain conditions. Similarly, packs in the branded condition were significantly (p=0.004) more likely to be rated as

lower health risk than plain packs. The colour brown on plain packaging again seemed to be associated with greater harm. In the UK, a convenience sample of 658 10-17 year olds, male and female non-smokers and smokers (Moodie 2012) were shown four plain packs with different background colour (green, red, blue and white) and the standard 'Smoking Kills' health warning shown on the front. Branded packs were not included in the study. Just under half (44%) made any associations between pack colour and level of harm. The red pack tended to be associated with greater harm, with 22% considering red to be the most harmful pack. For the green pack, no clear pattern emerged with 12% considering it to contain the most harmful cigarettes and an almost equal proportion (11%) considering it to have the least harmful cigarettes. The lighter colours were generally associated with reduced harm. The light blue pack was generally associated with least harm (15%) while the white pack was most clearly associated with least harm (18%).

4.4.2 Qualitative Studies

Two qualitative studies explored how plain pack colours were associated with perceptions of harm and strength.

In a UK qualitative study (Moodie 2011a), male and female 18-35 year old smokers in focus groups were shown four identical plain packs (no brand names or descriptors or tar/nicotine yields but with the UK health warnings, ie. text message on the front panel of the pack and pictorial on the rear) differing only by colour (dark grey, light grey, dark brown, light brown/beige). Participants were then shown four more packs, the same as the previous ones but coloured green, red, light blue and white. On each occasion they were asked which colour they associated with a list of words (including words related to product strength such as menthol and low tar). All groups associated red with 'full strength' and light blue with 'low tar' and white with 'ultra low tar' although there was debate in some groups about which colour should be matched with which description. However, in the absence of brand name, pack descriptors and information on tar or nicotine levels, smokers were found to associate product strength with pack colour. Similarly, for the other colour comparisons, the lighter coloured (light grey and light brown/beige) packs were viewed more favourably than the darker coloured (dark grey and dark brown) packs however as they suggested lighter, and therefore, less harmful cigarettes: *"It's the connotation of the colours as well: lighter colour, lighter cigarette"; "You think it's a lighter pack, it might be a lighter cigarette"*; "*They don't look as bad for you as what the darker colour ones do".* Although some smokers perceived the dark grey pack negatively and associated the colour with ash and death, it was the dark-brown pack that was disliked most in all groups, being described as horrific and ugly, and associated with excrement, dirt, mud, tar and rust.

A French qualitative study involved a convenience sample of 50 male and female smokers and non-smokers aged 15-45 years in focus groups (Gallopel-Morvan 2010a). Opinions were assessed on different cigarette packs (current or plain) with pictorial warnings on both faces or only on the reverse face; and attitudes towards three plain packs of different colours (white, grey and brown) with a pictorial warning on the reverse face. According to this report, there were 17 citations, from 8 individuals, that *"grey plain packs do not look like cigarette packages, they look poisonous and more dangerous"*. This was the only relevant finding reported and as such, this study provides little insight into the impact of plain packaging in communicating increased harm.

4.4.3 Sub-group Differences in Impact of Plain Packs on Perceptions of Product Harm and Strength

This section examines sub-group differences, where these were examined and reported in the studies, in the impact of plain packs on perceptions of product harm and strength.

Smoking status

Eight studies examined whether there were differences between smokers and non-smokers in terms of their perceptions of product harm. Overall, the pattern observed is that smokers tended to see all packs, both branded and plain, as less harmful than did non-smokers.

Gallopel-Morvan and colleagues (Gallopel-Morvan 2011) reported that non-smokers were more likely than smokers to choose the plain pack as the most effective to trigger discussions on the dangers of smoking ($p<0.01$) and to make people think that cigarettes inside the pack are dangerous ($p<0.05$).

In Hammond and colleagues' (Hammond 2011b) study with 18-19 year old women in the USA, smokers in the branded pack condition were more likely than non-smokers to rate the packs as lower tar ($\beta=1.2$, $p<0.001$). Smokers were also more likely to believe that packs would be lower health risk than non-smokers ($\beta=0.08$, $p=0.05$). When a regression was conducted among smokers only, respondents in the branded condition were more likely to rate packs as less harmful compared with those in the plain condition ($p=0.008$). Finally, a two-way interaction was observed in which smokers in the branded condition were more likely to rate packs as lower health risk ($p<0.001$).

In Hammond and colleagues' (Hammond 2011a) study with UK 16-19 year olds, smokers were more likely to believe that packs, both branded and plain, would be lower health risk ($\beta=0.08$, $p<0.027$) and less tar ($\beta=0.13$, $p=0.001$ than non-smokers.

White (White 2011) found that smokers perceived all the packs shown in the study, regardless of whether plain or branded, as less harmful ($p=0.019$) than did non-smokers. There were no significant two-way interactions between any of the moderators and experimental condition indicating that the direction of the findings for plain and branded packs were similar for smokers and non-smokers.

Similarly, Germain and colleagues (Germain 2010) found that responses were influenced by the participants' smoking status. Smokers had the most favourable perceptions of all the packs in terms of light taste, regardless of whether plain or branded. There was no significant relationship between pack condition (ie. plain or branded) with smoking status; in other words, the direction of the findings for plain and branded packs were similar for smokers and non-smokers.

Not all studies were consistent in their findings by smoking status. For example, in the Environics (Environics Research Group 2008a) youth survey, smokers were more likely than non-smokers to think that both packs (plain and branded with 75% health warnings) were equally effective when asked which pack was most effective in informing Canadians about the health effects of tobacco (25% vs. 19% respectively); non smoking youth were more likely than youth smokers to think the branded packs with 50% health warnings were more effective (26% vs. 20%).

Bansal-Travers and colleagues (Bansal-Travers 2011) reported no significant differences between smokers and non-smokers in perceptions of which pack had higher tar or they purchase to reduce risks to health, when examining ratings given to the plain versus branded pack. Results from the analyses remained consistent after logistic regression analyses were conducted, adjusting for age, gender, race/ethnicity, and education.

Finally, in Moodie and colleagues' (Moodie 2012) online survey, which compared perceptions of different colours of plain packs, ever-smokers were more likely to associate colour with harm than never-smokers ($p<0.01$). Susceptible never-smokers were more likely to make associations between colour and harm compared with non-susceptible never-smokers ($p<0.01$). However, where an association with colour was made, the pattern was similar for never- and ever-smokers and for susceptible and non-susceptible never-smokers, with each group associating red with greater harm and lighter colours (light blue and white) with reduced harm.

Age and gender

Three studies examined differences by age and two studies examined differences by gender. No consistent pattern emerges from the findings.

In the Environics (Environics Research Group 2008a) youth survey, in the plain pack comparison with the 50% health warning, youth age 15 to 18 were more likely than those aged 12 to 14 to think that the plain pack was most effective in informing Canadians about the health effects of tobacco (53% vs. 46%). Girls were more likely than boys to think the branded pack with the 75% size health warning was most effective in informing Canadians about the health effects of tobacco (29% vs. 22%).

In White (White 2011), older participants were less likely than younger participants ($p=0.007$) to think that there were differences between packs, regardless of whether branded or plain, in harmfulness).

Gallopel-Morvan and colleagues (Gallopel-Morvan 2011) reported no significant differences by age or gender in perceptions of which pack would trigger discussions on the dangers of smoking or would contain dangerous cigarettes.

Other socio-demographic differences

Three studies examined other sub-group differences. No consistent pattern emerged from the findings. In White (White 2011), people identifying as 'other' ethnicity were more likely than people identifying as 'white' to think that some packs, regardless of whether branded or plain, would be less harmful ($p=0.008$).

Environics (Environics Research Group 2008b) found no significant variations between sub-groups in perceptions of which pack was more effective in informing Canadians about the health effects of smoking in the adult survey among key demographic and attitudinal groups, with one exception: university graduates (57%) were more likely than those who had not finished high school (43%) to choose the plain pack in the 75% size comparison.

In the Hammond study with UK 16-19 year olds (Hammond 2011a) respondents who reported "non-white" ethnicity were more likely to believe that packs, both branded and plain, would be lower health risk ($\beta=.16$, $p<.001$) and less tar ($\beta=.13$, $p=.001$) than those reporting they were 'white'.

4.4.4 Summary

This section of the review outlines findings on the impact of plain packaging upon perceptions of the harmfulness and strength of cigarette products, packs and brands.

Sixteen studies (13 cross-sectional studies, one intervention study and two qualitative studies) examined whether and how perceptions of the harmfulness and strength of plain packs differ from

perceptions of the harmfulness and strength of branded packs, or how different kinds of plain packs differ in terms of perceived harmfulness and strength. Perceptions of harmfulness and strength were assessed in several ways, by asking respondents which packs: would deliver the most tar and/or nicotine or would be 'lighter' in tar; were a greater risk to health compared to other brands; would be associated with greater or lesser harm; would trigger discussions on harmfulness; inform the smoker about the health effects; and would be more likely to make you think that the cigarettes inside were dangerous. Perceptions of harm also included questions on which packs you would purchase if trying to reduce the risks to health or which were perceived as 'easier to quit'. From a public health perspective, all conventional cigarettes pose a similar health risk; smokers can alter the way they smoke cigarettes of different tar and/or nicotine machine-measured yields in order to compensate for differences and satisfy their nicotine addiction. In addition there is no evidence that brands differ in ease of quitting. As brightly coloured and attractive branded packs can reduce perceptions of the harmfulness of cigarettes, the desired outcome of these studies is that plain packs should be perceived as equally harmful as, or more harmful than, branded cigarettes, and plain packs should be seen as equally easy to quit as branded cigarettes or harder to quit.

The 14 studies which used quantitative methods to examine the impact of plain packs on perceptions of harm and strength found that findings were mixed as perceptions varied according to the colour of the plain pack. In general, darker coloured plain packs were seen as more harmful, and lighter coloured plain packs less harmful, than branded cigarettes. This indicates that misperceptions about the relative harmfulness of cigarettes were reduced when darker coloured plain packs were shown. Descriptor terms such as 'gold' or 'smooth' also affected response: in general, plain packs without descriptors were perceived as more harmful than packs with descriptors. This suggests that descriptor terms have the potential to mislead consumers about harm when used on plain packs, as on branded packs. Studies which examined perceptions of which pack was more effective in terms of raising awareness of health risk tended to find that plain packs were perceived as more effective than branded packs.

The studies which compared sub-group differences in response found that in general, smokers were more likely to have misperceptions about the harmfulness of packs, both plain and branded, than smokers. Few direct comparisons were made in respect to age, gender or other socio-demographic differences, and no consistent pattern emerges from these.

4.5 Smoking Related Attitudes, Beliefs, Intentions and Behaviour

Key findings:

- Plain packs appear to increase negative feelings about smoking .
- Plain packs are generally perceived as likely to have a deterrent effect on the onset of smoking by young people and as likely to encourage existing smokers to reduce their consumption or to quit, although in some studies they are perceived as likely to have little impact.
- Non-smokers, lighter smokers and younger people are more likely to perceive that plain packs would discourage or reduce smoking.

Sixteen studies examined whether and how plain packs impact on respondents' smoking-related attitudes, beliefs, intentions and self-reported behaviours, or explored perceptions of the potential impact of plain packs on smoking behaviour in general. Seven were cross-sectional surveys, one was an intervention study, and four were mixed methods studies involving quantitative and qualitative elements. Four of the studies used primarily qualitative methods. The study populations comprised adults and young people in Australia, Belgium, Canada, France, New Zealand, the UK and the USA.

4.5.1 Quantitative Studies

Eleven studies using quantitative methods examined whether and how plain packs impact on respondents' smoking-related attitudes, beliefs, intentions and self-reported behaviours, or explored perceptions of the potential impact of plain packs on smoking behaviour in general. Seven were cross-sectional surveys, one was an intervention study, and three used mixed methods. Findings are presented under three themes:

- The impact of plain packs on attitudes and beliefs regarding smoking (other than feelings about the attractiveness of cigarettes, covered in Section 4.2, and perceptions of the harm and strength of cigarettes in plain packs, which have been covered in Section 4.4).
- The perceived impact of plain packs on the smoking behaviour of young people and of smokers in general.
- The perceived impact of plain packs on respondents' own smoking-related intentions and behaviour.

Directions of effect are shown in Table 4.6. For the outcome 'attitudes and beliefs', 'favours plain packs' means that plain packs were associated with more negative attitudes and beliefs about smoking. For the outcome 'perceived impact on smoking behaviour in general', 'favours plain packs' means that respondents thought that plain packaging would make it less likely that people, particularly the young, would take up smoking, or would make it more likely that smokers would quit or reduce their consumption. For the outcome 'Perceived impact on own smoking intentions & behaviour', 'favours plain packs' means that respondents thought that plain packs would increase their cessation intentions or likelihood of quitting, or make them less likely to take up smoking.

In some studies, respondents were not asked to compare plain and branded packs directly but simply to give their opinions of what impact plain packaging would have if it was introduced; this is indicated in the 'Type of comparison' column by 'Opinions of plain packs'. For these studies, rather than refer to direction of effect, the table indicates whether opinions of the impact of plain packs were supportive, mixed, opposed, or whether respondents thought that plain packs would have no impact.

Table 4.6: Directions of Effect: Smoking-related attitudes and beliefs, impact on smoking behaviour in general, and impact on own smoking intentions and behaviour

Study	Type of comparison	Attitudes & beliefs	Perceived impact on smoking behaviour in general		Perceived impact on own smoking intentions & behaviour
			Young people	*Smokers in general*	
Centre for Health Promotion 1993	Branded vs. plain		Favours plain packs (onset)		
Donovan 1993	Opinions of plain packs		Supportive (onset)	No impact (cessation, reduction in consumption)	No impact (existing smokers) Mixed (non-smokers)
Doxey 2011	Branded vs. plain	Favours plain packs (beliefs about weight control)			
Environics Research Group 2008a	Branded vs. plain			Favours plain packs (reduction in consumption)	
Environics Research Group 2008b	Branded vs. plain			Favours plain packs (reduction in consumption)	
Gallopel-Morvan 2011	Branded vs. plain		Favours plain packs (onset)	Favours plain packs (cessation, reduction in consumption)	
Goldberg 1995	Branded vs. plain				Favours plain packs (non-smokers) No difference (young smokers and adult smokers)
	Opinions of plain packs	Supportive ('bothered by' plain packs)	No impact (consumption) Mixed (cessation)		
Hammond 2011b	Branded vs. plain	No difference (beliefs about weight control)			
Hoek 2011a	Branded vs. plain				Favours plain packs (adult smokers)
Moodie 2011b	Branded vs. plain	Favours plain packs (negative feelings about smoking)			Favours plain packs (adult smokers)
Rootman 1995	Opinions of plain packs		No impact (onset, consumption)		

Plain packs and attitudes and beliefs regarding smoking

Three studies (two cross-sectional surveys and an intervention study) compared the impact of plain packs and branded packs on respondents' attitudes and beliefs regarding smoking. A fourth study, a mixed methods study, asked young people how much they would be 'bothered by' cigarettes being available only in plain packs.

A naturalistic intervention study in Scotland (Moodie 2011b) compared the impact of plain packs and branded packs on attitudes towards smoking. Young adult smokers used plain packs and their own branded packs for two weeks each, and completed questionnaires throughout and at the end of the study. When using plain packs compared with their usual branded packs, participants reported more negative feelings about smoking, including significantly lower feelings of enjoyment and satisfaction ($p<0.05$ to $p<0.001$) and significantly higher ($p<0.001$) feelings of embarrassment and shame.

In a mixed methods study including a survey conducted with 14-17 year olds in Canada (Goldberg 1995), almost two thirds (62.7%) reported that it would bother them little if cigarettes were sold only in a plain pack, compared with 29% reporting that it would bother them a lot. There were some differences by smoking status which are described in the section on subpopulation differences below (3.5.3).

Two studies examined the impact of plain packs on beliefs about smoking and weight control. In a cross-sectional survey conducted with young women in Canada (Doxey 2011), linear regression analysis found that women who were shown plain packs were significantly ($\beta=-0.31$, $p=0.03$) less likely than women shown branded packs without descriptors to agree that 'smoking helps people stay slim', although there was no significant difference in agreement between women shown plain packs and branded packs with descriptors. Women shown plain packs were significantly less likely to agree, compared with women shown branded packs with descriptors ($\beta=-0.32$, $p=0.03$) and women shown branded packs targeted at men ($\beta=-0.39$, $p=0.009$), to agree that 'smoking helps people control their appetites'. No differences were found between women shown different packs in the proportions agreeing that 'quitting smoking causes weight gain'. In contrast, in a cross-sectional survey of young women in the USA (Hammond 2011b), no differences were found between those who were shown branded packs and those who were shown plain packs in beliefs about smoking and weight control.

Perceived impact of plain packs on smoking behaviour in general

Seven studies asked participants' opinions of the potential impact of plain packs on the smoking-related behaviour of smokers in general or of young people. Four were cross-sectional surveys and three were mixed methods studies including a quantitative element.

A cross-sectional survey (Gallopel-Morvan 2011) conducted with smoking and non-smoking adults in France showed respondents pairs of branded packs and plain packs and asked them to indicate which pack would 'increase teenagers' tobacco consumption', 'make teenagers reluctant to start smoking', 'motivate smokers to quit smoking' and 'motivate smokers to reduce tobacco consumption'. Plain packs were rated as significantly less likely to do the first of these and significantly more likely to do the latter three ($p<0.01$). There were some differences by smoking status which are described in the section on subpopulation differences below (3.5.3).

A mixed methods study including a survey with 12-17 year olds in Canada (Centre for Health Promotion 1993) found that plain packs were rated as significantly ($p<0.001$) more likely than branded packs to dissuade teenagers from smoking and less likely to attract teenagers to smoking, although over half believed that the same number of young people would buy cigarettes if cigarettes were sold in plain packs. When asked whether people their age would be willing to pay more, less or the same if cigarettes were sold in plain packs, most participants thought that they would pay less or much less. There were some differences by smoking status which are described in the section on subpopulation differences below (3.5.3).

In another mixed methods study in Canada, this time including a survey of 14-17 year olds (Goldberg 1995), the majority (58.8%) believed that having cigarettes available only in plain and generic packs

would not make any difference to the amount that teenagers smoked, with a minority thinking that teenagers would smoke a little less (29.9%) or a lot less (6.3%). Respondents were divided on beliefs about the impact on teenagers stopping smoking, with almost 40% believing that more would stop smoking and almost half believing that it would not affect the number who would stop. There were some differences by smoking status which are described in the section on subpopulation differences below (3.5.3).

In Donovan's (Donovan 1993) cross-sectional survey of smoking and non-smoking children and adults in Australia, respondents were asked what effects they thought plain packs would have on people who smoke (the report does not specify adult smokers, young smokers or any smokers). At an unprompted level (ie. when respondents were not provided with a list of possible responses), the largest group of participants suggested there would be 'no effect', with a slightly smaller group claiming that people might quit, be deterred, or smoke less. When asked, in the same study, what effect plain packs would have on children under 16 who do not yet smoke, the majority of respondents (71%) thought that plain packs would make them less likely to take up smoking, with 28% suggesting no effect. There were some differences by smoking status which are described in the section on subpopulation differences below (3.5.3).

Two cross-sectional surveys (Environics Research Group 2008a and 2008b) asked Canadians which pack they thought would be most effective in encouraging "Canadians" (the reports do not specify whether this referred to adult smokers, young smokers or any smokers) to reduce their tobacco use, comparing branded and plain packs with 50% and 75% size warnings. The survey with adults (Environics Research Group 2008b) found that smokers thought that the plain pack was more effective in encouraging Canadians to reduce their tobacco use, with 48% choosing the plain pack and 17% the branded pack, when both packs displayed a 50% size warning; the figures for packs displaying a 75% size warning were similar (49% plain pack, 18% branded pack). Twenty-two percent chose 'both' packs in both warning size comparisons. The survey with young people (Environics Research Group 2008a) found a similar pattern of response: 53% selected the plain pack and 23% the branded pack, when both packs displayed a 50% warning, and 54% selected the plain pack and 22% the branded pack when both packs displayed a 75% warning. In both size comparisons, 19% said 'both' packs were equally effective.

In Rootman's (Rootman 1995) mixed methods study, which included a survey conducted with young people in Canada, 25% of the Canadian respondents thought that plain packaging would encourage young smokers to smoke less and 71% said that it would make no difference. Just over a third, 35%, thought that plain packaging would make young non-smokers less likely to start smoking, and 62% said that it would make no difference. Although the overall study included respondents from the USA, the same questions do not seem to have been asked of the USA respondents.

Plain packs and own smoking-related intentions and self-reported behaviour

Four studies examined whether and how plain packs impacted or might impact on respondents' own smoking-related intentions and self-reported behaviour. One was a naturalistic intervention study in which respondents smoked plain packs and their own branded packs for two weeks each over a four-week intervention period and reported on their feelings and behaviours throughout and at the end of the study (Moodie 2011b); one was a cross-sectional survey comparing the impact of plain packs and branded packs on respondents' own smoking-related intentions (Hoek 2011a); one was a cross-sectional survey examining Australian smokers' views on their possible reactions if plain packs were introduced (Donovan 1993); and one was a mixed methods study including a conjoint experiment with teenagers and adults in Canada (Goldberg 1995).

In the naturalistic intervention study with young adult smokers in Scotland (Moodie 2011b), smokers reported at each of four waves of questioning that, when using plain packs as opposed to their usual branded packs, they were significantly more likely to keep the pack out of sight ($p<0.001$), to cover the pack ($p<0.01$ – $p<0.001$), to smoke less around others ($p<0.01$ – $p<0.001$), to think about quitting ($p<0.05$ – $p<0.001$) and to want to quit (at second and fourth waves only, $p<0.05$).

A cross-sectional survey of young adult smokers in New Zealand (Hoek 2011a) showed respondents two packs, one fully branded with a 30% health warning and one minimally branded with a standard font and a 75% graphic health warning, and asked how likely it was that they would reduce their consumption, seek help with quitting, or make a quit attempt. For each measure, respondents exposed to the minimally branded pack were significantly more like to indicate that they would engage in cessation-related behaviours than those who saw the fully branded pack (reduce consumption $p=0.000$; seek help with quitting $p=0.002$; make a quit attempt $p=0.009$).

In a cross-sectional survey (Donovan 1993) asking Australian teenage and adult smokers whether they would smoke more, less or the same if cigarettes were sold in plain packs, the majority felt that plain packs would make no difference (69%), with 30% thinking they would smoke less. There were some differences by smoking status which are described in the section on sub-group differences below (3.5.3). In the same survey, when non-smokers were asked whether they would be more or less likely to take up smoking in the future if cigarettes were sold in plain packs, 54% said they would be less likely and 46% that it would have no effect or they couldn't say.

A mixed methods study with teenagers and adults in Canada (Goldberg 1995) included a conjoint experiment which sought to estimate the relative utility of a number of attributes of cigarettes, including brand, price, type of pack and peer influence, for both current and several versions of plain and generic packaging and across several brands. The objectives were to compare the effects of current and different versions of plain and generic packaging - in the presence of brand and price information and statements about whether friends smoke the brand or not - with respect to: non-smoking teenagers' perceptions of "which cigarette encourages you most to start smoking"; smoking teenagers' perceptions of "which cigarette encourages you most to stop smoking"; and adult smokers' perceptions of "which cigarette encourages you most to stop smoking". Five different types of plain pack (four different colours and one with a pictorial warning) and one branded pack were used in the experiment. With respect to encouraging non-smoking teenagers to *start* smoking, the current branded pack was most encouraging and the plain pack with lungs warning least encouraging. All other versions of the plain pack were very similar in the degree that they were perceived as not encouraging non-smoking teens to start smoking compared with current pack.

With respect to encouraging teenage smokers to *stop* smoking, there was little difference in the utility of the plain pack versions and the current branded pack. A similar pattern was found for adult smokers with regard to which pack would encourage them more to stop smoking. Overall, the study concluded that price was perceived to be the most important attribute influencing the uptake or cessation of smoking. Pack type (current vs. plain and generic) was generally as important or more important than brand influence with respect to the uptake or cessation of smoking and more important than peer influences, except for teenage non-smokers.

4.5.2 Qualitative Studies

The qualitative findings reported in Section 3.2, Appeal, above are relevant here, as they show how feelings about the attractiveness of cigarettes appear to be weakened when plain packs are used. This is because plain pack colours often have negative connotations, the attractive brand imagery is

absent, packs have less power to convey positive smoking identities, and the smokers' attention is focused on the functional reality of smoking. In the section below we focus on findings from seven studies (four qualitative, one intervention and two mixed methods) exploring how plain packs might affect feelings about smoking in general, feelings about cessation and quitting behaviour, and feelings about starting smoking.

Plain packs and feelings about smoking

In Moodie and colleagues' (Moodie 2011b) naturalistic intervention study in Scotland, smokers discussed in qualitative interviews how using plain packs for two weeks in everyday settings triggered feelings of discomfort, distaste and guilt around smoking: *"It made me feel bad and gave me a guilty conscience"; "Smoking never really bothered me, like it was just something that I done and it never really bothered me, until I was using the brown pack because obviously the colour and how noticeable it was when you pulled them out the packet. It definitely did feel more horrible to actually smoke"*. For some study participants, particularly female smokers, these feelings led to them smoking fewer cigarettes, in part to minimise the feelings of unease and embarrassment triggered by getting the pack out in public. In qualitative focus groups with young adult smokers, also in Scotland, Moodie and Ford (Moodie 2011a) reported that smokers speculated that using plain packs would make them '*feel worse about smoking*' and would make smoking not '*feel the same'*.

A qualitative study (Hoek 2011b) comprising focus groups with 16-25 year olds in New Zealand suggested that plain packs would diminish the experience of smoking by stripping away the positive connotations generated by brand imagery and exposing the reality of smoking: *"Oh, stink…I wanna be excited by what I'm gonna smoke"*. Participants described how plain packs made them confront the functional nature of the smoking act and product: *"It looks so boring and…you sort of see the cigarette for what it is…They just look kind of very plain and filthy sorts of things".*

Plain packs and cessation

Three themes emerged from qualitative studies regarding the potential impact of plan packs on cessation and feelings about quitting. Firstly, some studies suggest that plain packs may trigger thoughts of quitting, or give an extra push for smokers already wanting to quit. In focus groups with 15-45 year old smokers and non-smokers in France (CNCT 2008a), smokers suggested that plain packs could help them to feel more determined to quit: *"It's not because the package is going to change that we will stop smoking immediately, but it can help to think about"; "I think it's a great idea because smoking is stupid even if it's a pleasure. I always think of stopping smoking and if there is no more differences between cigarette packs it can help me because it will become commonplace".* Similarly, in van Hal and colleagues' (van Hal 2011) focus groups with 15-19 year old current and ever smoking teenagers in Belgium, the plain pack could act as a trigger: *"Yes I think it really helps in quitting smoking. When I take it out of my backpack, I think: 'Shit, maybe I look like that inside'. So yes, it makes me think about quitting".*

Secondly, respondents in focus groups with 15-45 year old smokers and non-smokers in France (CNCT 2008a) suggested that plain packs could help those who were already trying to quit by removing temptation: *"Someone who stop smoking and see the coloured packs, it can tempt him to smoke again. But with this plain pack, he's not tempted because the pack is common, has no colours"; "Yes, because they think 'the pack is ugly'. If you stopped smoking and you see how packs became, you can think 'hopefully I stopped" [sic].*

A third theme from the qualitative studies suggests that committed and addicted smokers would be unconcerned by the appearance of packs and would become habituated to whatever packaging was introduced. Smokers in Moodie and Ford's (Moodie 2011a) focus groups in Scotland and in focus groups in France (CNCT 2008a) stated: *"I'd still smoke my brand of cigarettes regardless of what pack*

it was in" (Moodie 2011a); *"No, if the smoker is totally addicted, he doesn't care if there are stars on his pack"* (CNCT 2008a). In a mixed methods study in Canada (Beede 1990), the report of the focus group findings stated that plain packaging was considered to have very little effect upon the smoking behaviour of existing smokers, although reporting of the data was limited.

Plain packs and starting smoking

Most of the qualitative studies involved respondents older than 14 (although Goldberg et al's study involved some 12 and 13 year olds), and few discuss in any detail how plain packs make young non-smokers feel about smoking. In van Hal and colleagues' (van Hal 2011) focus groups with 15-19 year old current and ever smoking teenagers in Belgium, Moodie and Ford's (Moodie 2011a) focus group study with young adult smokers in Scotland, and Hoek and colleagues' (Hoek 2011b) focus groups with young adults, both smoking and non-smoking, in New Zealand, mixed views were reported concerning the potential effect of plain packs on the uptake of smoking. While some participants felt that plain packaging would have little effect because other influences on smoking are stronger, others felt that plain packs could have a deterrent effect on those not yet interested in smoking: *"I don't think that there is a big influence on daily smokers. But people who are going to buy their first package might think: 'I would better not do that' "* (van Hal 2011); *"As long as kids think it's cool to smoke and cool kids do smoke, it's [plain packaging] not going to have an effect"* (Moodie 2011a).

In Hoek and colleagues' (Hoek 2011b) focus groups with 16-25 year olds in New Zealand, participants felt that plain packaging would contribute to 'demolishing' positive images of smoking associated with particular brands, and that this would weaken the appeal of smoking to young people seeking to create a desired social identity. Similarly, focus groups with 15-45 year old smokers and non-smokers in France (CNCT 2008a) suggested that plain packs would have less symbolic power for young people wishing to convey an identity or style through smoking, as illustrated in the following quotes: "*When young people start smoking, it's not because they feel like smoking but only to do like their friends. I think the plain pack can be a solution for this problem because there will be no more possible identification"; "Young people start to give themselves a style, this style is totally broken with the plain pack. It's a really good idea".*

In a mixed methods study including focus groups with 12-17 year old Canadians (Goldberg 1995), authors noted a mismatch between young people's stated responses in focus groups to the concept of plain packaging – that plain packs would not discourage children like themselves from starting smoking – and their emotional and physical reactions when shown plain packs, which included *"grimaces, squirming in their seats, laughter and verbal involuntary exclamations such as dull, boring, ugly, weird"* (p42).

4.5.3 Sub-group Differences in Impact of Plain Packs on Smoking-related Attitudes, Beliefs, Intentions and Behaviour

This section reports sub-group differences, where these were examined and reported in the studies, in the impact of plain packs on smoking-related attitudes, beliefs, intentions and behaviour. Effect sizes have been calculated by the reviewers for sub-group differences in perceived impact on smoking-related behaviour for two variables, smoking status and age (see Section 3, Methods). For other sub-group differences in response, effect sizes are only reported in this section where they were reported in the original study.

Smoking status

Five studies report differences by smoking status in perceptions of the impact of plain packs on smoking behaviour in general or on respondents' own smoking-related intentions and behaviour.

The overall pattern suggests that non-smokers and lighter/less regular smokers tend to believe more strongly than smokers and heavier/more regular smokers that plain packs would discourage onset of smoking, encourage cessation or reduce consumption.

In a mixed methods study including a survey with 12-17 year olds in Canada (Centre for Health Promotion 1993), non-smokers tended to be more likely than smokers to think that fewer young people (12-17) would buy cigarettes if they were sold in plain packs, but this relation was not statistically significant (*OR* = 0.49, 95%CI = 0.22, 1.09).

In another mixed methods study including a survey of 14-17 year olds in Canada (Goldberg 1995), significant differences were reported by smoking status in the proportions saying that having cigarettes available only in plain packs would bother them. 'Experimenters' and 'vulnerable/naïve' smokers were bothered the least, and 'infrequent/regular' (smoke a few times a week up to once a day) and 'frequent/regular' (smoke more than once a day) smokers bothered the most (p<0.0001). In the same study, a significant relationship was reported between smoking status and whether respondents believed that plain packaging would affect the amount that teens would smoke: more frequent and regular smokers were more likely to believe that plain and generic packaging would make no difference, while 'vulnerable/naïve' smokers, experimenters and infrequent/regular smokers were more likely to believe that teens would smoke a little less (χ^2 = 34.3, p<0.05). There was a significant relationship between smoking status of respondents and whether they believe that such packaging would affect the number of teens who would stop smoking, with more frequent and regular smokers being more likely to believe it would make no difference and 'vulnerable/naïve' smokers and experimenters being more likely to believe that a few more would stop smoking (χ^2 = 25.2, p<0.05). The reviewers were unable to calculate effect sizes from the data given in the report.

Gallopel-Morvan and colleagues (Gallopel-Morvan 2011) compare adult responses by smoking status in the probability of rating plain packs, as opposed to branded packs, as more effective in terms of three outcomes: preventing onset, motivating cessation, and reducing consumption. In a binary logistic regression analysis, the authors reported that non-smokers were more likely than smokers to choose plain packs as more effective than regular or limited edition branded packs for motivating smokers to quit smoking and to reduce their consumption. A further binary logistic regression analysis reported that smokers motivated to quit, compared with smokers not motivated to quit, were significantly (p<0.05) more likely to consider plain packs as most likely to motivate smokers to quit. The reviewers were unable to calculate effect sizes because it was not stated whether standardised or unstandardised regression coefficients were reported and because the standard deviation of the dependent variable was not stated in the study.

In Donovan's (Donovan 1993) survey of smoking and non-smoking children and adults in Australia, adult heavy smokers were more likely than adult light and medium smokers to expect that plain packs would have no effect on people who already smoke (significance values not given). Moreover, non-smokers were significantly more likely than smokers to agree that plain packaging would 'turn off young people' from smoking (*OR* = 0.38. 95%CI = 0.29, 0.50). When asked what effect plain packs would have on children under 16 who do not yet smoke, smokers over age 30 were more likely to state 'no effect' (39%) than younger smokers (24%) and non-smokers (21%) (significance values not given). However, among 11-17 year olds, there were no differences between smokers and non-smokers.

The same survey (Donovan 1993) also examined differences in response between smokers of different brands. The study reports that smokers who used 'economy' brands were more likely than smokers who used 'image' brands to claim that plain packs would have 'no effect' on people who smoke, while 'image' brand smokers were more likely to claim that plain packs would encourage

smokers to smoke less (figures and statistical significance not given). A similar pattern of response was found when respondents were prompted with a list of possible responses: just over half (51.5%) claimed there would be 'no effect', 38% expected some smokers to smoke less, and 7.5% expected some smokers to quit. Across all three age groups (11-17, 18-29, 30-49) 'image' brand smokers were more likely than 'economy' brand smokers to expect a decrease in consumption and 'economy' brand smokers were more likely to expect 'no effect' (significance values not given).

In the Environics (Environics Research Group 2008a) survey of Canadian young people, a majority of both smoking and non-smoking youth stated that plain packs would be more effective than branded packs in encouraging Canadians to reduce their tobacco use. However, among the minority who stated that the branded pack would be more effective, non-smoking youth were more likely than smoking youth (24% vs. 16%, significance values not given) to select the branded pack.

Age and gender

Five studies examined and reported differences by age in perceptions of the impact of plain packs on smoking behaviour in general or on respondents' own smoking-related intentions and behaviour. overall pattern suggests that younger respondents were more likely than older respondents to feel that plain packs would impact negatively on smoking, ie. make it less likely that young people would take up smoking or more likely that existing smokers would quit or reduce consumption. Two studies examined responses by gender and reported no significant differences.

In a survey asking Australian teenage and adult smokers (Donovan 1993) whether **they themselves would smoke more, less or the same** if cigarettes were sold in plain packs, younger smokers were more likely to think that they would smoke less, if cigarettes were in plain packs, than older smokers (11-17 year olds 39%, 18-29 year olds 28%, 30+ year olds 23%, significance values not given). Younger smokers (11-17 years) responded that they thought they would smoke less if their cigarettes were in plain packaging to a greater extent than older smokers (18-29 years) (*OR* = 1.64, 95%CI 1.05, 2.57). In other words, younger smokers thought plain packs would affect their smoking habits more than older smokers did. Among 11-17 year old non-smokers, 62% thought plain packs would make it less likely that **they themselves would take up smoking**, compared with 45% of 18-29 year olds. This relationship is statistically significant: younger non-smokers (11-17 years) perceived that plain packaging would make it less likely that they would take up smoking in the future than older (18-19 years) non-smokers (*OR* = 2.037, 95%CI 1.432, 2.900).

In the same survey when asked what effects they thought plain packs would have **on people who smoke**, among smokers, older smokers were more likely than younger smokers to claim there would be 'no effect' (11-17 year olds 45%, 18-29 year olds 54%, 30+ year olds 68%, significance values not given). Similarly, when asked what effect plain packs would have **on children under 16 who do not yet smoke**, smokers over age 30 were more likely to state 'no effect' (39%) than younger smokers (24%) and non-smokers (21%) (significance values not given). Across smokers and non-smokers, children (11-17) were significantly more likely than adults (18-29) to rate that plain packaging would 'turn young people off smoking' (*OR* = 1.52, 95% CI = 1.14, 2.02).

In a mixed methods study including a survey with 12-17 year olds in Canada (Centre for Health Promotion 1993), younger and newer smokers appeared more likely than older smokers to feel that fewer young people would smoke if cigarettes were sold in plain packs (significance values not given). Specifically, 12-15 year olds tended to be more likely than 16-17 year olds to think that fewer people their age would buy cigarettes if sold in plain packs, but this relation was not statistically significant (*OR* = 1.89, 95%CI = 0.94, 3.82).

In a mixed methods study including a survey 14-17 year olds in Canada (Goldberg 1995), there were no significant differences by age in the proportions of respondents saying that having cigarettes available only in plain packs would bother them. The same study reported no statistical relationships between age and gender and whether respondents believe that plain packaging would affect the amount that teens would smoke or whether respondents believed that plain and generic packaging would affect the number of teens who would stop smoking.

Gallopel-Morvan and colleagues (Gallopel-Morvan 2011) report no significant differences by age in the probability of rating plain packs, as opposed to branded packs, as more effective in terms of motivating smokers to quit and motivating smokers to reduce consumption. Young adults were reported to be more likely ($p<0.05$) than older adults to select a plain pack rather than a branded pack as more effective in preventing non-smokers from starting smoking, for one of the brands included in the study (Lucky Strike), but there were no differences by age in likelihood of selecting a plain pack rather than a branded pack for the other two brands in the study (Camel and Gauloises). The reviewers were unable to calculate effect sizes because it was not stated whether *standardised* or *unstandardised* regression coefficients were reported and because the standard deviation of the dependent variable was not stated in the study. There were no significant differences reported by gender in likelihood of selecting plain packs rather than branded packs as more effective for motiving smokers to quit, motivating smokers to reduce consumption, and preventing non-smokers from starting smoking.

In the Environics (Environics Research Group 2008b) survey of Canadian adult smokers, a majority of both younger and older smokers stated that plain packs would be more effective than branded packs in encouraging Canadians to reduce their tobacco use. However, among the minority who stated that the branded pack would be more effective, older smokers (over 45) were more likely than younger smokers (18-34) (significance values not given) to select the branded pack.

4.5.4 Summary

This section has outlined findings from 16 studies that examined whether and how plain packs impact on smoking-related attitudes and beliefs, the perceived impact of plain packs on smokers and young people in general, and the perceived impact of plain packs on respondents' own smoking-related intentions and behaviours.

Two studies found that plain packs were associated with more negative feelings about smoking and one study showed that plain packs were less likely than branded packs to reinforce beliefs among women that smoking helps people to stay slim or control their appetite; a fourth study found that plain packs had no impact on beliefs about smoking and weight control.

Seven studies asked participants how the introduction of plain packs might impact on the smoking behaviour of smokers in general and/or young people in general. The overall pattern of findings is mixed, but tends to be supportive of plain packaging being perceived to have a likely deterrent effect on smoking. In three of the five studies which examined perceptions of the impact on young people, plain packs were perceived as likely to reduce onset of smoking by young people, while in the other two studies which examined this, plain packs were perceived as no more likely than branded packs, or only slightly more likely than branded packs, to reduce the amount that young people smoked. Among the four studies which examined perceptions of the impact of plain packs on smokers in general, plain packs were perceived as likely in three of the studies to encourage smokers to reduce their consumption or to quit.

Four studies examined the potential impact of plain packs on participants' own smoking behaviour. Again the overall pattern is mixed but tends to be supportive of plain packaging having a deterrent effect on smoking. A naturalistic intervention study (Moodie et al 2011b) found that when young adults in Glasgow put their own cigarettes in plain packs they were more likely to think about quitting and to want to quit. Likewise, a survey in New Zealand (Hoek 2011a) found that respondents exposed to minimally branded or plain packs were more likely to say that they would engage in cessation-related behaviours. The other two studies reported mixed results, with existing smokers tending to feel that plain packs would make no difference to them, and non-smokers tending to feel that plain packs might deter them from smoking, or having mixed views on this. The seven studies using qualitative methods identified similar themes, suggesting that plain packs were perceived as likely to trigger thoughts of quitting, strengthen determination to quit, or to remove one form of temptation.

Studies that looked at differences in response by smoking status tend to suggest that non-smokers and lighter/less regular smokers are more likely than smokers and heavier/more regular smokers to perceive that plain packs would discourage the onset of smoking, encourage cessation or reduce consumption. Studies that looked at differences by age tend to suggest that younger respondents were more likely than older respondents to perceive that plain packs would discourage the onset of smoking, encourage cessation or reduce consumption. No differences were reported by gender.

4.6 Facilitators and Barriers to the Introduction of Plain Packaging Policies

Key findings:

- Surveys of public opinion, mostly in Australia, have suggested a slight majority in favour of plain packaging. Non-smokers were more likely to approve than smokers.
- Non-smokers were more likely to approve of the introduction of plain packaging than smokers.
- Two of the potential problems with plain packaging – difficulties with brand recall and increased purchase transaction times– were addressed in two studies, which found that plain packaging did not affect brand name recall and speeded up transaction times.

In addition to the main findings of the studies included in this review, we also examined potential facilitators and barriers to the introduction of plain packaging identified in the included studies. Twelve studies explored facilitators and barriers under three main themes:

- Public opinions of plain packaging policies.
- Benefits or harms of plain packaging.
- Studies that address the harms identified.

Six were surveys, four were studies using qualitative methods, one was a mixed methods study that included a survey and qualitative component and one was an intervention study. The study populations comprised adults, decision-makers in tobacco control, and young people in Australia, Canada, France and the UK

4.6.1 Public Opinions of Plain Packaging Policies

Four cross-sectional surveys and two qualitative studies included material on what the public would think about the introduction of plain packaging. Overall, these studies suggest that, in the countries where the research took place, most people would approve of the introduction of plain packaging. They also found that, perhaps unsurprisingly, when examining the views of different groups, smokers were less likely than non-smokers to approve of the policy.

Three surveys explicitly asked respondents whether they approved or disapproved of plain packaging as a policy measure (Centre for Behavioural Research in Cancer 1992a, Donovan 1993, Shanahan 2009). In the CBRC (Centre for Behavioural Research in Cancer 1992a) study, 49% of Australians surveyed said they would approve of the introduction of plain packaging, with 39% disapproving. The only sub group that was more likely to disapprove was smokers (53% smokers, 34% non-smokers). Smokers were significantly more likely to disapprove of plain packaging than non-smokers (*OR* = 2.20, 95%CI = 1.71, 2.83). When asked whether they approved or not of the measure, if it discouraged children from smoking, the level of approval rose to 87% of Australians surveyed, with disapproval at 8%.

Donovan's (Donovan 1993) survey of Australians' opinions of plain packaging showed that more non-smokers than smokers expressed unqualified approval (66% versus 41%), and that unqualified approval amongst smokers increased with age: 11-17: 34.5%; 18-29: 40.5%; 30+: 47%. Male non-smokers (65%) were less likely than female non-smokers (84%) to approve of plain packaging as were 11-17 year old smokers (50%) compared to adult smokers (70%).

Also in Australia, Shanahan and Elliot (Shanahan 2009) asked respondents if they agreed or disagreed with the following statement: 'I think that cigarettes should be sold in plain (generic) packs, specifying only brand name and Government information such as health warnings and information to assist smokers to quit'. Overall, 57% of people agreed with the statement. Sub group analysis revealed several differences by gender and smoking status: male smokers (46%) were more likely than female smokers (36%) to agree, and similarly male recent quitters (47%) were more likely to agree than female recent quitters (40%);; non-smokers (62%) and long term ex-smokers (53%) were more likely to agree with the statement than were recent quitters (50%) or smokers (43%). In addition, rural respondents were more likely to agree with the statement than were those from metropolitan areas, 62% to 54%. Those recent quitters who felt that their knowledge of the health effects of tobacco consumption had improved as a result of the graphic health warnings were more likely to agree compared to those who said their knowledge was no different, 47% to 38%; and those recent quitters whose annual income was less than or equal to AUS$40k (56%) were more likely than all other income groups (35% to 46%) to agree with the statement.

The fourth survey (Freeman 2010) asked 69 senior decision makers in tobacco control in Australia to rate the most important policy option to improve controls on smoking. Plain packaging policies was the third most popular in the list of options, with 95.7% of respondents judging the policy to be *'very or somewhat effective'*. However, only 29% were confident that this policy would be introduced in the next 5 to 10 years.

There were also two qualitative studies that gauged public approval for plain packaging (Centre for Behavioural Research in Cancer 1992b, CNCT 2008a). From a sample of 66 young people in Australia, the CBRC study found that about a third would approve of a government that brought in plain packaging, and two thirds expressed disapproval or were neutral. The disapproval came from both smokers and non-smokers, with neutral responses mainly from non-smokers.

In France, the CNCT (CNCT 2008a) focus group study found there was support overall for the introduction of plain packaging, with 25 respondents in favour and 6 opposed (sample =34). When asked why they would support such a policy, participants provided two primary reasons – firstly that they thought the policy may protect young people from tobacco, and secondly that they thought it could help to reduce smokers' consumption. Individual participants who expressed opposition to the policy were mainly smokers, who liked the familiarity and attractiveness of their current packs. Some smokers also argued that, in their view, plain packaging would have no effect on either smoking uptake or consumption.

4.6.2 Benefits or Harms Identified with the Policy Introduction

Five qualitative studies explored views of potential benefits or harms that could arise from the introduction of plain packaging (Carter 2006, Centre for Behavioural Research in Cancer 1992b, CNCT 2008a, Moodie 2011a, Shanahan 2009).

In terms of benefits, three studies put forward the argument that plain packaging could reduce tobacco consumption, by 'inconveniencing smokers' (Carter 2006), and by deterring young people from starting smoking, overlapping to some extent with the findings summarised above relating to reasons for public approval (CNCT 2008a, Moodie 2011a). Two studies suggested that there would be a benefit to the consumer by a reduction in price because the packs could be cheaper to produce (Carter 2006, Centre for Behavioural Research in Cancer 1992b). Both CNCT (CNCT 2008a) and Shanahan and Elliot (Shanahan 2009) reported that participants thought that plain packaging would reinforce the messages about the risks to health of smoking. In Shanahan and Elliot (Shanahan 2009), this would be achieved by making the health warning more prominent, and in CNCT (CNCT 2008a), plain packets would underline the difference between cigarettes and other consumer products that did not present a danger to health. The stakeholder interviews conducted by Shanahan and Elliot (Shanahan 2009) involved interviewing professionals. Findings from these interviews mirrored those of the general public, in that professionals reported that they thought that the removal of branding cues would weaken the attractiveness of tobacco products and increase the salience of health warnings, particularly for young people.

In contrast, a small number of qualitative studies highlighted potential negative consequences from the introduction of plain packaging. In Carter and colleagues' (Carter 2006) study with adults in Australia, some participants expressed concern that plain packaging and other tobacco control policies such as point of sale display bans would give cigarette smoking an 'illicit' or 'forbidden' element, which would increase its appeal, particularly for young people. A small number of participants stated that they feared plain packaging could contribute to an increase in tobacco smuggling and 'the black market'. In the same study, some smokers wondered if buying cigarettes would become more difficult with plain packaging, as sales assistants frequently did not smoke, and smokers feared they may need to answer awkward questions about their favourite brand in order to ensure that the right product was selected, increasing transaction times. In addition, some smokers felt that plain packaging would make it more difficult for 'their' brand to be identified, particularly by others responsible for selling cigarettes to them. This concern was also raised by some focus group members in the CBRC study (Centre for Behavioural Research in Cancer 1992b)..

4.6.3 Studies that Address the Potential Harms Identified

There were four studies (Environics Research Group 2008a, Goldberg 1995, Beede 1990, Carter 2011) which provide data that addresses two of the issues raised in the qualitative studies concerning the implementation of the policy, namely brand recognition and transaction times.

A number of studies have established that young people, including non-smokers, have a good knowledge of existing cigarette brands. Some of the studies in this review examined brand recognition with both current and plain packs. For example, Goldberg (Goldberg 1995) explored how many brands Canadian teenagers could recognise even with brand names removed, and found that on the basis of packaging alone, 90% could recall the two most popular brands and that overall teenagers could identify almost half of nine brands with the name removed. Unsurprisingly, brand recognition was more common amongst teenagers who were smokers than non-smokers.

Despite brand recognition, the qualitative studies above suggest that smokers may be concerned that plain packaging will affect their ability to choose between brands. Two studies in the review provide some data that directly addresses this potential disadvantage of the introduction of plain packaging. The first was a survey conducted with smoking and non-smoking 12 to 18 year olds in Canada (Environics Research Group 2008a). This reported that, overall, in experimental testing, 71% of respondents correctly recalled the brand name of the branded pack they were shown, and 82% correctly recalled the brand name of the plain pack they were shown. Young smokers were more likely than non-smoking young people to correctly recall the brand name on both branded (89% vs. 69%) and plain (91% vs. 81%) packs. Young people aged 15 to 18 were also more likely than those aged 12 to 14 to demonstrate correct recall of brand names of both branded (76% vs. 63%) and plain (86% vs. 77%) packs. For the plain packs, 81% could recall the brand name of the pack with the 50% font size option, and 82% could recall the brand name of the pack with the 75%size option. Recall was consistently higher among smokers than among non-smoking young people. This study suggests therefore that for young smokers at least, plain packaging would not affect brand recall.

Similarly, Beede and colleagues (Beede 1990) found that young people could recall brand names equally on plain and branded packs (77% cf. 74.8%) for familiar (83% cf. 80%) and unfamiliar (71.5% cf. 69.3%) brands, leading them to conclude that information on plain packs could be easier to process because of less stimuli, than the branded packs.

A second concern identified above was that the introduction of plain packaging would increase transaction times for smokers trying to buy cigarettes. Carter and colleagues (Carter 2011) conducted an experimental study with students on a university campus in Australia, to test the effects of plain packaging on transaction times for shop assistants. This was a one group study where participants were randomised to select plain or branded packs first from a mock-up of a shop shelf. After they had completed the transactions with both plain and branded packs, the time they took to locate and select the different kinds of packs were compared, as well as the number of selection errors they made.

They found that the average transaction was significantly quicker for plain compared to branded packs (2.92 vs. 3.17 sec.; p=0.040). One or more mistakes were made by 40.4% of participants when selecting branded packaging compared to only 17.3% for plain packaging (p=0.011). The researchers interviewed the participants after the experiment to gather the views of the students about the difficulty of the task. Their results suggest the colours and inconsistent location of brand names often served to distract when participants scanned for brands.

4.6.4 Summary

This section of the review outlines findings on issues that can be described as facilitators and barriers to the introduction of plain packaging. Twelve of the studies included in the review addressed these, focusing on three main themes: public opinions of plain packaging policies, benefits or harms of plain packaging, and studies that address the harms identified.

Six studies included material on what the public would think about the introduction of plain packaging. Five of the studies were conducted in Australia and no UK studies were included. The studies reported varying levels of support, with the overall pattern suggesting a slight majority in favour. Non-smokers were more likely to approve than smokers.

Five qualitative studies explored views of particular benefits or harms that could result from plain packaging. Suggested benefits included that plain packaging could reduce tobacco consumption, by 'inconveniencing smokers' and by deterring young people from starting smoking, and that plain packaging would reinforce messages about the health risks of smoking by making the health warning more prominent. It was also suggested that plain packaging would make cigarette packs look different by removing their branding, underlining the difference between tobacco and other consumer products that do not present such a danger to health. A further suggested potential benefit to the consumer was that the packs would be cheaper to produce, resulting in a reduction in price.

Four suggested potential harms were also identified in qualitative studies. First, that plain packs could increase the appeal of smoking to young people by making it 'forbidden', and second, that this could increase tobacco smuggling. Thirdly, it was suggested that plain packaging might increase the time taken by shop assistants to locate the correct brand. Finally some smokers expressed the view that they or others might not be able to differentiate or choose between brands when plain packaging was introduced.

Two of the harms identified – problems with brand identification and increased transaction times – were explored in other studies in the review. An experiment with young Canadian smokers found that plain packaging would not affect brand recall, and a study with young people found that the information on plain packs would be easier to process than the branded packs and would not affect brand choice. Finally an Australian study tested purchasing arrangements for branded and plain packs on a university campus and found that the average transaction time was significantly quicker for plain packs compared to branded packs.

5 DISCUSSION

The FCTC states that plain packaging might be expected to deliver health benefits by reducing the appeal of the pack and the product, making health warnings more prominent and therefore more effective, and the use of pack colour and other elements of pack design that might mislead consumers and potential consumers about the dangers of smoking. This systematic review of the plain packaging literature aimed to review the evidence to support these three proposed benefits, to examine differences in response by smoking status, age, gender and other variables, and also to review what this literature reveals about any potential facilitators and barriers to the effectiveness of plain packaging.

This review found that there is strong evidence to support all three of the FCTC propositions. Plain packaging has been shown to:

- reduce pack and product appeal, by making packs appear less attractive and of lower quality, and by weakening the positive smoker identity and personality attributes associated with branded packs;

- increase the salience of health warning, in terms of improving the recall and perceived seriousness and believability of warnings; and

- reduce the confusion about product harm that can result from branded packs.

Plain packaging was also perceived as likely to have a deterrent effect on the onset of smoking by young people and as likely to encourage existing smokers to quit. The review also found some evidence that non-smokers and, to a lesser extent, smokers, approved of the idea of plain packaging, with both groups feeling it would make smoking less attractive, particularly to young people.

A total of 37 studies were included in this review. The included studies comprised 23 cross-sectional surveys, eight qualitative investigations (focus groups or interviews), four mixed methods quantitative and qualitative elements, and two intervention studies. Sixteen of the studies focussed on young people, and eight included smokers only. Most of the studies were conducted in Australasia, North America or Western Europe. Six studies were from the UK.

The discussion will consider, individually, each of the five main areas covered in this review and then consider the strengths and limitations of the research literature.

5.1 Appeal of Cigarettes, Packs and Brands

A total of 28 studies assessed the impact of plain packaging on the appeal of packs, cigarettes and smoking in general. Three aspects of appeal were examined in the review: attractiveness, perceived quality, and the extent to which the pack is associated with a desirable smoker identity. Irrespective of the methodology, sample characteristics and location, all quantitative and intervention studies which directly compared the appeal of plain packs and branded packs found that plain packaging reduced appeal in all three areas, and these themes were also found in the qualitative studies.

In terms of attractiveness, plain packs were perceived as less attractive, exciting, fashionable, cool, stylish, appealing, nice and colourful than branded packs, and were less likely to be chosen in preference tests. Studies that tested a range of branded and unbranded packs found that packs became more negatively rated as progressively more brand elements were removed. In studies

which examined perceptions of quality, plain packs were perceived as poorer quality, poorer tasting, less smooth and cheaper than branded packs. Studies which examined the smoker identity attributes associated with different packs found that smokers of plain packaged cigarettes were perceived as less popular, fashionable, sophisticated, confident, stylish, sociable and trendy - and more boring, older and lower class. Associations between particular brand names and attributes (for example, Marlboro being associated with the outdoors) were weakened when smokers were shown plain pack equivalents. Studies which examined perceptions of plain packs in isolation, without comparing them with branded packs, also show them to be unappealing. In the ten qualitative studies that examined appeal, four key themes emerged to explain why plain packs were consistently rated as less attractive and lower quality and had a poorer image than branded packs. Plain pack colours were found to have negative connotations, to weaken smokers' attachment to brands, to project a less desirable smoker identity, and to expose the functional and uncomfortable reality of smoking.

Non-smokers tended to find plain packaging less appealing than did smokers, and younger respondents tended to find it less appealing than did older respondents, where these differences were examined. Only one study examined gender differences, and suggested that women found plain packaging less appealing than did men.

These effects are consistent with the wider marketing literature, which places emphasis on packaging as a valuable marketing tool (see Section 2 above). Investment in it is seen as important and worthwhile (Meyers & Lubliner 1998); to be successful it must appeal visually and create a positive impression (Sara 1990, Grossman 2006); and the pack is part of the product (Simms & Trott 2010) and can influence evaluations of product quality (Finco et al 2010). In line with these observations the UK and other tobacco markets have seen extensive pack innovations in recent years, including special editions and reengineered packs (Mitreva 2011, Neman 2011). The tobacco industry has reported the positive effects these developments have had on sales (Moodie & Hastings 2010). By removing key elements of appeal, plain packaging reduces the utility of the pack as a marketing tool.

5.2 Salience of Health Warnings

Twelve studies examined whether plain packs increase people's ability to notice and recall the health warnings on packs or whether plain packs affect the perceived seriousness and believability of the warnings. One survey measured eye movements to measure visual attention to packs, while the other surveys and the mixed method studies briefly showed participants different plain and branded packs and then asked them what they recalled, using either unprompted or prompted measures or both.

Of the seven studies which statistically compared responses to warnings on plain packs and branded packs, four studies suggested that plain packaging increases the salience of health warnings, in terms of recall of warnings and perceptions of their seriousness, one study found no difference, and two found mixed results. The impact of health warnings on plain packs appeared to be influenced by the size, type and position of the warnings used in the studies. The study which recorded eye movements suggested that non-smokers and weekly smokers paid more attention to warnings on plain packs than did daily smokers. No study examined gender, age or other socio-demographic differences.

From the qualitative studies, two themes emerged: that plain packs were perceived as having less 'clutter' on them to detract from the health warning, and that the dullness and seriousness of the

packs enhanced the seriousness and believability of warnings. Overall, the qualitative research tends to support the quantitative findings, with these findings collectively suggesting that the absence of competing branding (aside from brand name) on plain packs serves to enhance the visibility of the warnings.

The review findings are generally consistent with the tobacco health warnings literature and the guidelines for Article 11 of the FCTC, suggesting that warnings are most effective when prominent and on the front of pack, and are strengthened by the use of pictures. For example, in one of the studies which included a condition with the text warnings only on the side of the plain pack, extremely low levels of recall were found (Rootman 1995), whereas an Australian study assessing response to pictorial warnings prominently displayed on the plain pack front found very high levels of recall (Germain 2010). However, the fact that these warning had been in circulation in Australia for two years may also account for the findings.

5.3 Perceptions of Product Harm and Strength

Sixteen studies examined whether and how perceptions of the harmfulness and strength of plain packs differ from perceptions of the harmfulness and strength of branded packs, or how different kinds of plain packs differ in terms of perceived harmfulness and strength. Measures of perceived harmfulness and strength included perceptions of which pack would deliver the most tar and/or nicotine, would be a greater risk to health or more harmful compared to other brands, or would raise awareness of the risks to health of smoking. Perceptions of harm also included questions on which packs you would purchase if trying to reduce the risks to health or which were perceived as 'easier to quit'. From a public health perspective, all conventional cigarettes pose a similar health risk; smokers can alter the way they smoke cigarettes of different tar and/or nicotine machine-measured yields in order to compensate for differences and satisfy their nicotine addiction. In addition there is no evidence that brands differ in ease of quitting. As brightly coloured and attractive branded packs can reduce perceptions of the harmfulness of cigarettes, the desired outcome of these studies is that plain packs should be perceived as equally harmful as, or more harmful than, branded cigarettes, and plain packs should be seen as equally easy to quit as branded cigarettes or harder to quit.

The 14 studies which used quantitative methods to examine the impact of plain packs on perceptions of harm and strength found that findings were mixed as perceptions varied according to the colour of the plain pack. In general, darker coloured plain packs were seen as more harmful, and lighter coloured plain packs less harmful, than branded cigarettes. This indicates that misperceptions about the relative harmfulness of cigarettes were reduced when darker coloured plain packs were shown. Studies which examined perceptions of which pack was more effective in terms of raising awareness of health risk tended to find that plain packs were perceived as more effective than branded packs. Studies which compared sub-group differences in response found that in general, smokers were more likely to have misperceptions about the harmfulness of packs, both plain and branded, than smokers. Few direct comparisons were made in respect to age, gender or other socio-demographic differences, and no consistent pattern emerges from these.

As outlined in Section 2 above, it is well established that colour is an important factor in package design that can heighten pack appeal and influence product perceptions and choice for a wide range of consumer products (Silayoi & Speece 2004, Silayoi & Speece 2007, Elliot 2009, Ogba & Johnson 2010). It is also known that for tobacco products, colour can be used to communicate product strength and harm (Cavalcante 2003, Wilkenfeld et al 2000). The review findings indicate that consumers equate pack colour with product strength, tar delivery and harm. This misunderstanding

has implications for public health and raises the issue of consumer protection. The available studies indicate that branded packaging is an obstacle to consumers acquiring accurate product information. Specifically the use of colour contributes to consumers underestimating the dangers of smoking.

Although the evidence suggests that plain packaging can reduce misperceptions about the relative harmfulness of different brands, at least plain packs with a dark base colour, it also suggests that this may be undermined by the use of descriptors on packs. Descriptor terms such as 'gold' or 'smooth' affected response: in general, plain packs without descriptors were perceived as more harmful than packs with descriptors. Some studies found that even with plain packaging, descriptors were still associated with product strength, lower levels of perceived harm and health risk, and also ease of quitting (Hammond 2009, White 2011). This suggests that descriptor terms have the potential to mislead consumers about harm when used on plain packs, as on branded packs.

5.4 Smoking Related Attitudes, Beliefs, Intentions and Behaviour

Sixteen studies examined whether and how plain packs impact on smoking-related attitudes and beliefs, and the perceived impact of plain packs on smokers and young people in general, and on respondents' own smoking-related intentions and behaviours.

Seven studies asked participants how the introduction of plain packs might impact on existing smokers and young people. The overall pattern of findings is mixed, but tends to be supportive of plain packaging being perceived to have a deterrent effect on smoking, with plain packaging being perceived in three of five studies as likely to discourage young people from starting, and in three of four studies as likely to encourage reductions in consumption or quitting among existing smokers. The other studies generally found that plain packs were perceived as no more likely, or only slightly more likely, to have these effects than branded packs.

In terms of the potential impact of plain packs on participants' own smoking behaviour, two studies suggest that plain packs may help some smokers to quit. An intervention study found that when smokers put their own cigarettes in plain packs, they were more likely to think about quitting and to want to quit, and a survey found that respondents exposed to minimally branded or plain packs were more likely to express quitting intentions. Two other studies reported mixed results, with existing smokers tending to feel that plain packs would make no difference to them, and non-smokers tending to feel that plain packs might deter them from smoking, or having mixed views on this. Non-smokers, lighter smokers and younger respondents tended to be more likely to perceive that plain packs would discourage the onset of smoking, encourage cessation or reduce consumption, where these differences were examined.

Studies which examined the impact of plain packs on attitudes and beliefs about smoking found that they were associated with more negative feelings about smoking. The seven studies using qualitative methods suggested that plain packs were perceived as likely to trigger thoughts of quitting, strengthen determination to quit, or to remove one form of temptation.

Some caution is required in interpreting these findings, as expressed smoking-related intentions are not always predictive of future smoking behaviour (Ajzen & Madden 1986, Sheeran 2002) and perceptions of the impact of a future policy measure on the behaviour of others are of course subjective. However, there is some evidence from the studies in this review that plain packaging may affect smoking-related attitudes and beliefs, and smoking behaviour, particularly for young people and/or non smokers and lighter smokers.

5.5 Facilitators and Barriers to the Introduction of Plain Packaging Policies

Twelve of the studies included in the review examined issues that can be described as facilitators or barriers to the introduction of plain packaging, focusing on three main themes: public opinions of plain packaging policies, benefits or harms of plain packaging, and studies that address the harms identified.

Studies of public opinion (five out of six of which were conducted in Australia) on plain packaging tended to suggest a slight majority in favour. Non-smokers were more likely to approve than smokers.

Five qualitative studies explored views of particular benefits or harms that could result from plain packaging. Suggested benefits included that plain packaging could reduce tobacco consumption, deter young people from starting smoking, reinforce messages about the health risks of smoking by making the health warning more prominent, and help to underline the difference between tobacco and other consumer products that do not present such a danger to health. A further suggested potential benefit to the consumer was that the packs would be cheaper. Suggested potential harms included that plain packs could increase the appeal of smoking to young people by making it 'forbidden', could increase tobacco smuggling, might make it harder to differentiate between brands and might increase the time taken by shop assistants to locate the correct brand.

Two of the harms identified – problems with brand choice and increased transaction times – were explored in two studies, which found that plain packaging would not affect brand recall, and that the average transaction time was significantly quicker for plain packs compared to branded packs.

This last study raises the issue of the brand name, and the impact this may continue to have in the event of plain packaging being introduced. Whether the brand name on plain packaging retains the same value for consumers as brand name on existing packs is not clear from the existing literature, although some studies suggest that the standardisation of brand name (Wakefield 2008, Germain 2010, Hoek 2011a) reduces pack, product and user appeal, and one study, although with a small sample size, suggests that the standardisation of brand name on plain packs also appears to contribute to a loss of brand identity (CNCT 2008b).

5.6 Study Strengths and Limitations

The main strength of this project is that it is a systematic review of the relevant literature, with the studies it included identified as the result of careful and extensive searches. As such, while we cannot be sure we have found every single possibly relevant study, we can be confident that we have followed best practice with regard to our searching and have taken steps to avoid bias in the sample of studies we have retrieved. We have also checked the studies we have included for relevance and methodological rigour. This being the case, we can be confident that the statements we have made in this review genuinely reflect the current state of research evidence in this area.

There are also a number of limitations with the plain packaging studies found. Some of these arise because plain packaging is not yet in place in any country and therefore it has not yet been possible to conduct research that could fully evaluate the potential impact of this policy. This affects study design, which is the first limitation of the review.

Studies of the type that are generally regarded as the most robust (those that compare a population exposed to an intervention with one not exposed to it, such as randomized controlled trials) are not

available because plain packaging is yet to be introduced and so therefore 'real' comparisons cannot be made. Gartner and Hall (2011), for example, highlight the value of trials in respect to public health policies but suggest that it is not practically possible to conduct trials for all population level interventions particularly those not yet available. This is the case for plain packaging. Similarly, other designs which help increase confidence in the findings, such as longitudinal designs are also unfeasible in respect to assessing plain packaging prior to its introduction. The absence of trials and longitudinal research is the most significant limitation of this review, although one which is impossible to avoid until the policy is in place in at least one jurisdiction.

A second limitation in relation to study design is that the evidence in the review is largely drawn from correlational studies, which makes it difficult to draw conclusions about expected outcomes. Many of the studies use hypothetical scenarios, and are therefore not truly able to test how individuals would react or behave if plain packaging was to be introduced. Within the correlational studies in the review there are further limitations in that some of the surveys use samples representative of the general population but most do not, and instead use convenience or probability sampling. This same lack of representativeness also applies to the qualitative research included, although focus groups and interviews are not intended to be representative. However, a more relevant limitation of some of the qualitative studies included was that quite limited information about the methodology and analysis was provided, although this may partly be due to the fact that many of these studies had been translated or were early drafts of papers. It is also worth noting that findings regarding smoking-related attitudes, beliefs and behaviour from both the surveys and qualitative studies in the review are reliant upon self-report. Without any form of validation (such as validating reported changes in cigarette consumption) these have quite weak predictive validity. A common argument is that plain packaging research can never truly replicate real market conditions and, as such, the suggested impacts on consumption, cessation and uptake are so far speculative.

An additional limitation is that the full set of 37 studies included unpublished material (some of which was translated into English) and government reports, which contained variable levels of detail regarding the research methods used which in some instances made it more difficult to determine methodological rigour. The vast majority of recent studies are, however, peer reviewed published articles. Also all included studies have been confined to a small number of high income countries, most of which have strong tobacco control. This restricts the ability to predict the potential impact of plain packaging in less developed nations, although given the universal appeal of cigarette packaging (Thibodeau & Martin 2000) there would be no obvious reason to suggest these findings would be different in these countries.

A further limitation is that when comparing new packs (in this case plain packs) with those already in the marketplace the new packs typically attract a great deal of both favourable and unfavourable attention and this can distort the findings (Schlackman & Chittenden 1986). For the studies reviewed there appears to be very little evidence of favourable comments in respect to the new (plain) packs, however. A further limitation is that the studies in the review almost all focus on comparing coloured branded packs with plain unbranded packs of various neutral colours, but not including other potentially critical elements of the packaging such a size, shape, and sensory effects (smell, touch, sound).

Finally it is worth noting that we were not able to access internal tobacco industry research on packaging and pack standardization, beyond what is included in the tobacco industry legacy library. This internal industry material is not included in the review but also constitutes part of the evidence-base. The fact that this type of information is not publicly available is a cause for concern and highlights the need for disclosure of industry marketing research or reports that researchers as well

as consumers should be able to access in the same way that academic research is expected to be made available.

Despite these limitations it is worth emphasizing the remarkable consistency in study findings regarding the potential impact of plain packaging. Across studies using different designs, conducted in a range of countries, with young and older populations and with smokers and non-smokers the key findings are similar. This consistency of evidence can provide confidence about the observed potential effects of plain packaging. If and when introduced, existing evidence suggests that plain packaging represents an additional tobacco control measure that has the potential to contribute to reductions in the harm caused by tobacco smoking now and in the future.

6 REFERENCES

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The included studies are cited in the review using a study identifier (the first author's surname and date of the primary reference) identified in bold below. Where the study and/or its methods were reported in more than one paper or report, the primary study is identified by an asterisk below. Superscript numbers on some of the references refer to additional notes on the version of the paper the review team used[1].

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Appendix 1: Electronic Databases

- ABI INFORMGlobal and ABI/INFORM Archive Complete
- ASSIA (Applied Social Sciences Index and Abstracts)
- Business Source Premier
- Cochrane Library
- Conference Papers Index
- Conference Proceedings Citation Index- Social Science & Humanities
- EconLit
- EMBASE
- ERIC (Education Resources Information Center)
- Health Promis
- HMIC (Health Management Information Consortium)
- Index to Theses (UK and Ireland)
- IBSS (International Bibliography of the Social Sciences)
- PubMed
- Proquest Dissertation and Theses
- PsycINFO
- Social Policy and Practice
- Social Policy Digest
- Sociological Abstracts
- TROPHI (Trials Register of Public Health Interventions)
- Social Science Citation Index
- Zetoc
- FRANCIS
- CAB Abstracts

Other catalogues and websites:

- Advertising Education Forum database
- CDC Smoking and Health Resource Library
- Dart Europe (theses)
- ECDC: European Centre for Disease Prevention and Control
- Google Scholar
- King's Fund Library
- Legacy Tobacco Documents Library (includes the British American Tobacco Archive)
- OpenGrey (System for information on Grey Literature in Europe)
- Social Science Research Network
- UK Tobacco Industry Advertising Documents Database
- WHO: World Health Organization
- World Advertising Research Center
- WorldCat Library Catalogue
- A database of studies collected for a previous EPPI-Centre review on young people's access to tobacco.

Appendix 2: Search Strategy

Tobacco concept AND plain packaging, where:

Tobacco	
Free text terms OR controlled terms where:	
Free text terms:	***Controlled terms:***
cigar$ hand-roll$ HRT make-your-own MYO roll-your-own RYO smok$ Tobacco kretek bidis beedis Snuff chew$ gutk$ zarda pan mas$ paan Betel Beedi Bidi Rollie$ (nicotine)	(dependent on specific databases) Tobacco products Cigarettes Tobacco industry Smoking cessation Tobacco use

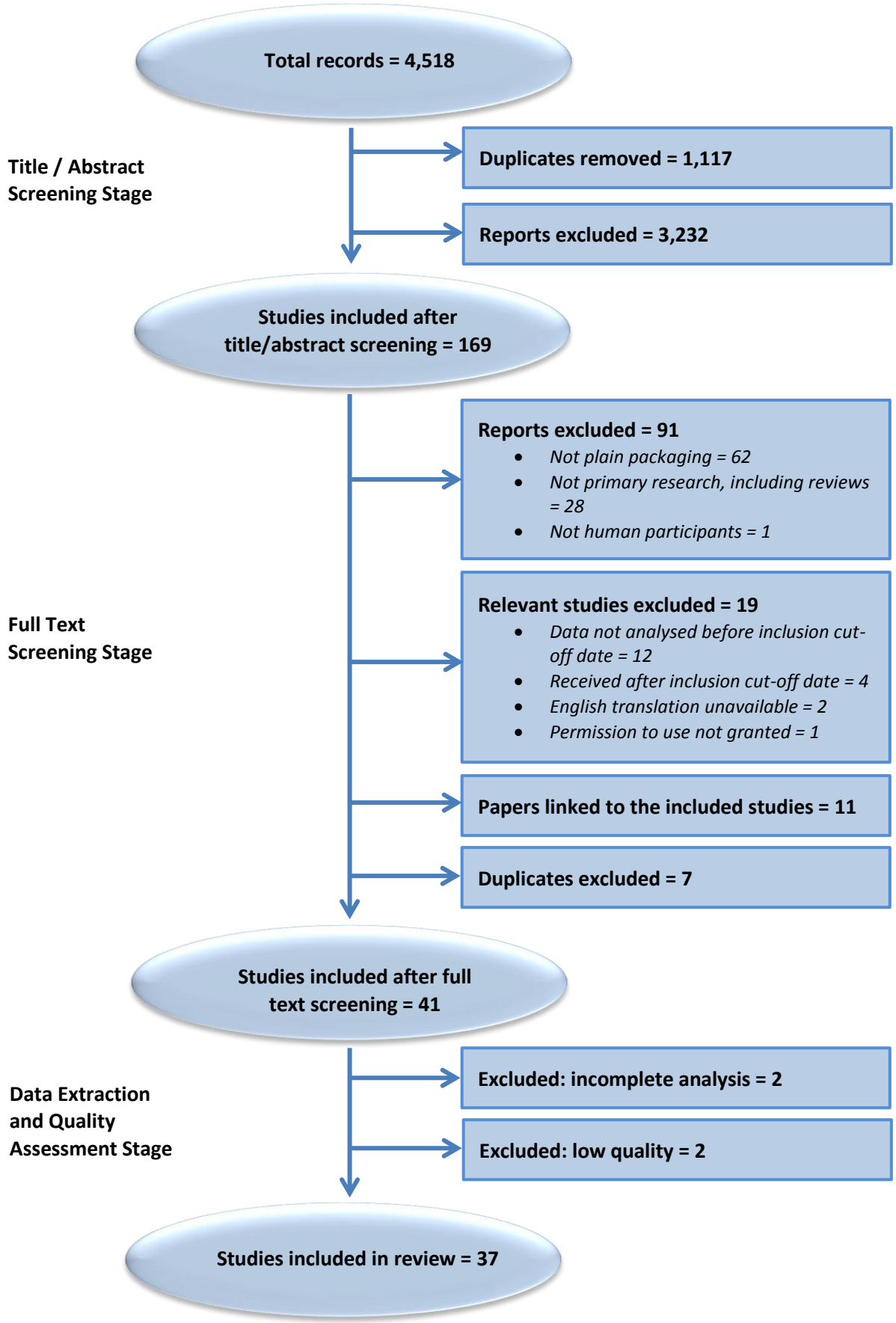
Plain Packaging		
(free text terms for packaging AND free text terms for plain) OR (controlled terms for plain packaging) where:		
	Free text terms:	***Controlled terms:***
Packaging	Pack$ Container containers Carton Cartons Pouch Pouches Tin Tins Softpacks Hardpacks Hardpack Softpack Cans Canister canisters cardboard can plastic can	(dependent on specific databases) Brand names Brand Preferences Product packaging Product labelling Marketing (where a more specific term is absent)

Plain	dissuasive Generic Homogenous Plain standard, standardised, standardized Unbranded no-frills Neutral Plainer Plainest Unliveried Design Designs *Brand removal, terms (remove AND brand):* ((Remove OR removal OR absence OR restrict OT restricted OR restrictions OR outlaw OR outlawing OR ban OR bans OR prohibition OR prohibit) AND (descriptor OR descriptors OR trade mark OR trade marking OR trade marks OR trade marking OR graphic OR graphics OR graphical OR logo OR logos OR symbols OR symbol OR vignette OR vignettes OR brand OR brands branding OR liveried OR image OR images))	

Example search: Pubmed 23/6/2011, yielding 687 records.

((cigar*[tiab] OR hand-roll*[tiab] OR HRT[tiab] OR make-your-own[tiab] OR MYO[tiab] OR roll-your-own[tiab] OR RYO[tiab] OR smok*[tiab] OR tobacco[tiab] OR kretek[tiab] OR bidis[tiab] OR beedis[tiab] OR snus[tiab] OR snuff[tiab] OR chew*[tiab] OR gutk*[tiab] OR zarda[tiab] OR pan mas*[tiab] OR paan[tiab] OR betel[tiab] OR beedi[tiab] OR bidi[tiab] OR rollie*[tiab]) OR (smoking[mh:noexp] OR tobacco use cessation[mh] OR tobacco industry[mh])) AND ((pack design[tiab] OR pack designs[tiab] OR packet design[tiab] OR packet designs[tiab] OR package design[tiab] OR package designs[tiab] AND (("1980"[PDat] : "2011"[PDat]))) OR (product packaging[mh:noexp] OR product labeling[mh]) OR ((((descriptor[tiab] OR descriptors[tiab] OR branding[tiab] OR brand[tiab] OR brands[tiab] OR trade mark[tiab] OR trade marks[tiab] OR trade marking[tiab] OR graphics[tiab] OR graphical[tiab] OR graphic[tiab] OR logo[tiab] OR logos[tiab] OR vignette[tiab] OR vignettes[tiab] OR liveried[tiab] OR image[tiab] OR images[tiab] OR design[tiab] OR designs[tiab]) AND (remove[tiab] OR removal[tiab] OR removing[tiab] OR absence[tiab] OR restricted[tiab] OR restriction[tiab] OR restrictions[tiab] OR restrict[tiab] OR outlaw[tiab] OR outlawing[tiab] OR ban[tiab] OR bans[tiab] OR prohibition[tiab] OR prohibit[tiab])) OR (dissuasive[tiab] OR generic[tiab] OR homogenous[tiab] OR plain[tiab] OR plainer[tiab] OR plainest[tiab] OR standard[tiab] OR standardised[tiab] OR standardized[tiab] OR unbranded[tiab] OR no-frills[tiab] OR unliveried[tiab] OR neutral[tiab] OR shape[tiab] OR shapes[tiab])) AND (pack[tiab] OR packet[tiab] OR package[tiab] OR packs[tiab] OR packaging[tiab] OR packets[tiab] OR packages[tiab] OR pouch[tiab] OR pouches[tiab] OR tin[tiab] OR tins[tiab] OR container[tiab] OR containers[tiab] OR carton[tiab] OR cartons[tiab] OR softpack[tiab] OR softpacks[tiab] OR hardpack[tiab] OR hardpacks[tiab] OR canister[tiab] OR canisters[tiab] OR plastic can[tiab] OR cans[tiab] OR cardboard can[tiab])) AND (("1980"[PDat] : "2011"[PDat])))

Appendix 3: Flow of Studies Through the Review



Appendix 4: Quality Assessment Tools

A: Surveys

1. Was the sampling method appropriate / was the sample representative of the population under study?
    a. Probability sampling - Score 1
    b. Non-probability sampling - Score 0
2. Was the measurement of the independent variable(s) likely to be reliably assessed and validated?
    a. Yes - Score 1
    b. No - Score 0
    c. Not applicable - Score 1
3. Was the measurement of the dependent variable(s) likely to be reliably assessed and validated?
    a. Yes - Score 1
    b. No - Score 0
    c. Not applicable - Score 1
4. Did the study report any response rate?
    a. Yes - Score 1
    b. No - Score 0
    c. Not applicable - Score 1
5. Did the investigator(s) control for confounding factors in analysing the associations?
    a. Yes - Score 1
    b. No - Score 0
    c. Not applicable - Score 1
6. Do you have any concerns about the statistical methods used?
    a. Yes - Score 0
    b. No - Score 1
7. Was follow-up long enough for the outcomes to occur?
    a. Yes - Score 1
    b. No - Score 0
    c. Not applicable - Score 1

Overall grade for the survey: High Quality - total score 7; Medium Quality – total score 4-6; Low Quality – total score 0-3

B: Qualitative Studies

1. Were steps taken to strengthen rigour in the sampling?
    a. Yes, a fairly thorough attempt was made - Score 3
    b. Yes, several steps were taken - Score 2
    c. Yes, minimal few steps were taken - Score 1
    d. Unclear - Score 0
    e. No, not at all / Not stated / Can't tell - Score 0
2. Were steps taken to strengthen rigour in the data collected?
    a. Yes, a fairly thorough attempt was made - Score 3
    b. Yes several steps were taken - Score 2
    c. Yes, minimal few steps were taken - Score 1
    d. Unclear - Score 0
    e. No, not at all / Not stated / Can't tell - Score 0

3. Were steps taken to strengthen the rigour of the analysis of data?
    a. Yes, a fairly thorough attempt was made - Score 3
    b. Yes, several steps were taken - Score 2
    c. Yes, minimal steps were taken - Score 1
    d. Unclear - Score 0
    e. No, not at all / Not stated / Can't tell - Score 0
4. Were the findings of the study grounded in / supported by the data?
    a. Well grounded / supported - Score 3
    b. Fairly well grounded / supported - Score 2
    c. Limited grounding / support - Score 1
5. Please rate the findings of the study in terms of their breadth and depth
    a. Good / Fair breadth, but little depth - Score 2
    b. Good / fair depth but very little breadth - Score 2
    c. Good / fair breadth and depth - Score 3
    d. Limited breadth and depth - Score 1
6. Privileges participants' perspectives/experiences?
    a. Not at all - Score 0
    b. A little - Score 1
    c. Somewhat - Score 2
    d. A lot - Score 3

Overall grade for the qualitative study: High Quality - total score 17-18; Medium Quality – total score 9-16; Low Quality – total score 0-8

C: Intervention studies

Methodological characteristics of the study

1. Number of participants recruited to intervention and control/comparison groups
    a. Not stated
    b. Unclear
    c. Reported
2. What was the unit of allocation into each intervention and control/comparison group?
    a. Not stated
    b. Unclear
    c. Community
    d. Group/class, eg. tutor group
    e. Individuals
    f. Region
    g. Other
3. Was the allocation to intervention and control/ comparison groups done blind?
    a. Not stated
    b. Unclear
    c. Yes
    d. No
4. Were participants aware which group they were in for the evaluation?
    a. Not stated
    b. Unclear
    c. Yes
    d. No
5. Was outcome measurement done blind?
    a. Not stated

    b. Unclear
    c. Yes
    d. No
6. What sort of measurement tool(s) is/are used to collect outcome data?
    a. Interview
    b. Observation
    c. Practical test
    d. Psychological test
    e. Self-completion report or diary/questionnaire
    f. Clinical test
    g. Other
    h. Unclear
    i. Not stated
7. Name of measuring tools
    a. Not stated
    b. Stated
8. Were the measuring tools validated?
    a. Not reported
    b. Unclear
    c. Reported
9. Number of outcome assessment periods
    a. Not stated
    b. Unclear
    c. One
    d. Two
    e. Three
    f. Four or more
10. Timing(s) of post-intervention measurements
    a. Not stated
    b. Unclear
    c. Immediately after the intervention
11. Did the study use 'intention-to-treat' or 'Intervention received' analysis method?
    a. Not stated
    b. Unclear
    c. Intention to treat
    d. intervention received

Avoiding selection bias

12. How were subjects allocated to control and intervention groups?
    a. Random
       eg. Table of random numbers, computer-generated random sequences
    b. Non-random
       eg. Date of birth, day of week, month of year, medical record number, order in which participants included in the study, such as alternation
    c. Not clear/not stated
13. Did the analysis adjust for baseline imbalances in major prognostic factors between groups?
    a. Not applicable (one group in study only)
    b. Not relevant (groups were equivalent)
    c. Yes
    d. No

Avoiding attrition bias

14. Is the attrition rate reported separately according to allocation group?

a. Yes
b. No
c. Not applicable (one group study only)

15. What is the attrition rate?
    a. For the intervention group(s)
    b. For the control/comparison group(s)
    c. Overall
    d. Unclear
    e. Not relevant (no details on attrition reported)

Avoiding selective reporting bias

16. What outcomes did the authors say they were intending to measure (ie. as described in the aims of the evaluation?)
    a. Not stated
    b. Unclear
    c. Attitudes
    d. Awareness/beliefs
    e. Behaviour (reported)
    f. Health problem or state (prevalence and/or incidence)
    g. Intentions
    h. Knowledge
    i. Other
17. For whom were outcomes given?
    a. Unclear
    b. Information for some individuals/groups only
    c. Information for all individuals/groups
    d. Info for study population as a whole

Decision on soundness of study

18. Was selection bias avoided?
    a. yes
    b. No
19. Was attrition bias avoided?
    a. Yes
    b. No
20. Was selective reporting bias avoided
    a. Yes
    b. No
21. Taking account of the above, what is the weight of evidence A?
    a. High trustworthiness
    b. Medium trustworthiness
    c. Low trustworthiness
22. Weight of evidence B: Appropriateness of research design and analysis for addressing the questions of this review
    a. High
    b. Medium
    c. Low
23. Weight of evidence C: Relevance of particular focus of the study (including conceptual focus, context, sample and measures) for addressing the question of the review
    a. High
    b. Medium
    c. Low
    d.

24. Weight of evidence D: Overall weight of evidence

a. High
b. Medium
c. Low

Appendix 5: Plain Packaging Studies which met Relevance Criteria but were not Screened at Full Text and not included within the Review

Project lead	Location	Date	Study design	Age	Sample size	Smoking Status*	Appeal	Warnings	Harm	Attitudes & Behaviour	Facilitators/ Barriers	Reason for Exclusion
Al-Hamdani M	Canada	2011	Survey	19+	231	B	✓					Missed cut-off date
Borland R	Australia	2011	Survey	18-29	160	S	✓	✓				Missed cut-off date
Eker F	France	2010	Focus groups	16-45	40	B	✓	✓	✓	✓		Data not analysed yet
Ford A	Scotland	2011	Survey	11-16	~1500	B	✓					Data not analysed yet
Ford A	Scotland	2011	Focus groups	15	54	B	✓					Missed cut-off date
Gallopel-Morvan K	France	2008	Survey	16-45	905	B	✓		✓	✓		Translation unavailable
Hammond D	Canada	2008	Mall intercept survey	19+ 16-18	408, 379	S, B	✓	✓	✓	✓		Data not analysed yet
Hammond D	Australia	2010	Online survey	19+ 16-18	1102, 756	S, B	✓		✓	✓		Data not analysed yet
Hammond D	China	2011	Survey	19+	511	S	✓		✓	✓		Data not analysed yet
Hoek J	New Zealand	2011	Interviews	18-30	15	S	✓			✓	✓	Data not analysed yet
Hoek J	New Zealand	2011	Interviews	18-30	17	S	✓	✓				Data not analysed yet
Hoek J	New Zealand	2011	Survey	18-30	600	B	✓	✓	✓	✓		Data not analysed yet
Maynard O	England	2011	Experimental (visual probe)	22-34	60	B	✓					Data not analysed yet
Maynard O	England	2011	Experimental (eye-tracking)	14-18	~100	B		✓				Data not analysed yet
Rey JM	Spain	2009	Focus groups	16-45	58	B	✓	✓	✓	✓		Translation unavailable

Scheffels J	Norway	2011	Survey	16-22	1010	B	✓		✓			Missed cut-off date
Scheffels J	Norway	2011	Focus groups	16-50	69	B	✓					Data not analysed yet
Wakefield M	Australia	2008	Experimental	18+	1203	S	✓		✓	✓		Data not analysed yet
Webb L	New Zealand	2010	Focus groups	14-16	80	B	✓					Permission not granted

***Smokers (S), Non-smokers (NS), Both smokers and non-smokers (B)**