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A brief review of plain packaging research for tobacco products

Report prepared for Department of Health

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Introduction

In September 2009 the Public Health Research Consortium was approached by the Department of Health to conduct a rapid review of the literature on plain packaging for tobacco products. Time was very constrained, but every effort has been made to track down and assimilate as much as possible of the published and unpublished research in the area. This report presents the findings.

What is plain packaging?

Definitions of plain tobacco packaging (also referred to as ‘standardised’ ‘generic’, ‘homogeneous’ and ‘dissuasive’ packaging) from the 1980s onwards are generally consistent, although since 2000 they have become more explicit, in response to innovation by the tobacco industry. The terms are now taken to cover standardisation of shape, method of opening and base colour, with the brand name required to be printed using a standard typeface, colour and font size on the pack front. Standardised packs must also be devoid of *all* promotional elements (trademarks, logos, product claims) but are required to meet the legal requirements for displaying constituents, Duty Paid stamps and health warnings.

Definitions have focused on cigarettes, rather than other tobacco products such as cigars or hand rolling tobacco – although it would be straightforward to transfer the thinking to these other categories. Product standardisation has not been given any detailed consideration.

Review aims

In this review we examine the evidence base to address two questions:

1. What is the current state of the evidence base, and does it support a move to plain packaging?
2. What are the gaps in the literature and are there areas where it could be improved?

As well as reviewing the studies provided by the Department of Health, we also draw attention to other plain packaging research, including on-going, unpublished and planned research, although time constraints may have resulted in unpublished and on-going studies being missed.

Report Structure

According to the literature there are three ways in which plain packaging might be expected to deliver health benefits: by making health warnings more prominent and therefore stronger; by reducing the promotional power of the pack (and therefore the amount of tobacco promotion) and by preventing the use of labels and creative devices that might deceive consumers and potential consumers about the dangers of smoking. The review therefore starts by examining the evidence for these three phenomena.

It then goes on to examine the studies that have looked directly at the consumer response to plain packaging. This literature is split into two sections: *early* research (pre-2000) and *recent* research (post-2000), which provides a useful means of assessing not only the strength of the overall evidence, but also its consistency.

Finally, revisiting the review aims, conclusions are drawn about a) the current state of the evidence base, and the extent to which it supports a move to plain packaging and b) the research gaps that remain to be filled.

Health warnings, pack as promotion and pack as deception

Studies of various kinds have examined the benefits of health warnings, the role of the pack as a marketing tool and the extent to which consumers have been deceived by different aspects of pack design.

Health warnings

Health warnings on tobacco products serve three key functions (Shanahan & Elliot, 2008; ITC Policy Evaluation Project, 2009):

1. Educating/informing smokers and non-smokers about the health consequences of smoking,
2. Motivating cessation among smokers, and reducing initiation among non-smokers,
3. Enhancing quit efficacy

Research indicates that size of tobacco health warnings are proportional to perceived and actual effectiveness (EnviroNics Research Group, 2008a; EnviroNics Research Group, 2008b; Les Etude de Marché Createc 2008a; Les Etude de Marché Createc, 2008b), with a pan-European qualitative study finding that larger EU text warnings increased salience and depth of processing (stimulated greater thought and discussion), and limited the pack's ability to communicate brand value (Devlin et al., 2005). Longitudinal research confirmed these findings in the UK (Hassan et al., 2008). In Holland the new text warnings, which included a smoking quitline number, led to a six-fold increase in calls to the quitline at its peak (Willemsen et al., 2002), and one in ten adult smokers reported that the warnings had helped them reduce consumption (Willemsen, 2005).

Larger text warnings therefore have proved an important means of communicating with both smokers and non-smokers. In 2001 pictorial health warnings were first introduced in Canada, and since this time fourteen other countries have now implemented pictorial warnings and at least ten others plan to do so by the end of 2009. Within the last five years in particular research attention has turned to assessing the potential benefits of pictorial warnings, with the available research consistently, and comprehensively, demonstrating their superiority over text warnings (Hammond, 2008; Borland et al., in press; Moodie, MacKintosh & Hammond, under review). For instance, comparative research examining Canadian pictorial warnings with text-only warnings from either the UK, the US, Australia or Mexico demonstrate that pictorial warnings increase adult smokers' awareness of warnings, knowledge and credibility of health risks, depth of processing and also cessation behaviours such as forgoing cigarettes, quit intentions and quitting (Hammond et al., 2006; O'Hegarty et al., 2007; Hammond et al., 2007; Thrasher et al., 2007). These findings extend to youth who are also more likely to read, attend to, recall and discuss pictorial warnings compared to text warnings (Kempf & Harmon, 2006; White, Webster & Wakefield, 2008) and consider them more persuasive (Vardavas et al., 2009).

Research therefore confirms that on-pack health warnings are an effective way of telling the public about the health risks of smoking (see Hammond 2008 for more detailed discussion) and that their efficacy increases when they become more prominent and explicit. This suggests that standardised packaging – which would free up space for health warnings and remove the competing brand messages – would increase their effectiveness.

The promotional appeal of the pack

In jurisdictions with strong marketing restrictions the tobacco industry has offset the loss of prohibited marketing channels by creatively exploiting unregulated marketing channels (Davis et al., 2008) most notably packaging (Freeman, Chapman & Rimmer, 2008). In the UK, for instance, a review of the retail trade press suggests that the pack has become a key promotional vehicle since the final phase of the Tobacco Advertising and Promotion Act (Moodie & Hastings, in press^a). Moodie and Hastings describe how tobacco industry marketing documents in the UK, from 1995-2000, explained the future importance of the pack with impending restrictions on tobacco advertising, and also how the pack can be employed in different ways to promote the product. These forms of packaging involve altered pack size or price-marking (*value packaging*), the use of pack design (*image packaging*) and pack modifications, such as shape or method of opening (*gimmick or innovation packaging*).

Some examples of value, image and innovation packaging are reported in the trade press from 2002 to 2004, but mention of all three forms of packaging increases markedly from 2005 onwards, as other forms of marketing were restricted. The success of these forms of packaging underlines the importance of packaging as a marketing tool. For example, price-marked Sterling packs (value packaging) introduced in 2008 saw market share increase from 5% to 6.1% in four months (Walker, 2009). ‘Celebration’ Lambert & Butler packs launched in 2004 (image packaging) increased market share by 0.4% (£60 million) during their four month release (Good, 2006). And the Benson & Hedges Silver slide pack released in 2006 (innovation packaging) increased sales by 25% within six months and a further 32.5% (£74.5 million) a year later (The Grocer, 2007). In the latter two cases spokespeople for the producer companies, Imperial Tobacco and Gallaher, explicitly attributed sales success to the packs (The Grocer, 2006; Good, 2006). As a tobacco industry journal points out, tobacco packaging is no longer the ‘silent salesman’ it once was - it now shouts (Tobacco Journal International, 2001).

The tobacco industry, then, clearly acknowledges that the pack is a marketing tool. They defend it on the grounds that its role is to facilitate choice among adult smokers (JTI, 2008). However no evidence is presented to support this contention, or to show that packaging is not having a promotional impact on non-smokers or children. On the other hand, tobacco industry document analyses does show that significant time and resources have been expended investigating the impact of packaging on youth (Hastings & MacFadyen, 2000; Pollay, 2000; Pollay, 2001; Cummings et al., 2002; Wakefield et al., 2002). As Moodie and Hastings (in press^b) point out, even if we chose to overlook these internal documents and accept that adult brand-switching is the industry’s sole aim, we are still left with the problem of collateral damage: attractive or innovative packaging aimed at adults will inevitably be seen by youngsters.

Standardisation would prevent the pack being used as a marketing tool and thereby remove these problems.

Pack as deception

The research literature demonstrates that consumers are misled by pack descriptors, colours and constituent levels and as a result many underestimate the health risks associated with smoking (Kozlowski, Goldberg & Yost, 2000; Schiffman et al., 2001; Hammond, 2008;

Hammond & Parkinson, in press; Hammond et al., in press). These concerns have encouraged a number of jurisdictions – including the EU, Australia and Brazil - to prohibit pack descriptors such as Light and Mild. However the industry has responded by replacing them with other misleading descriptors, numbers or colour coding (Hoek, 2006). For instance, in the UK Lambert and Butler Lights have become Lambert and Butler Gold, and Superkings Lights became Superkings Blue (Curtis, 2003). Similarly, an impending ban in New Zealand has led to Light, Mild and Low Tar packs being re-labelled Blue, Silver and Gold respectively (Peace et al., 2007), and in the U.S. RJ Reynolds have already replaced Salem Lights and Ultra Lights with Salem Gold and Silver (Cummings, personal communication), despite contesting the very recent US Family Smoking Prevention and Tobacco Control Act which prohibits misleading pack descriptors.

It is now clear that this colour coding is also providing false comfort about the health risks posed by cigarettes (Hammond et al., in press) and it does so to *all* consumers, irrespective of age and smoking status. One of the arguments deployed against standardised packaging is that it would ‘reduce the ability of consumers to make informed choices’ (Lovell White Durrant, 1994); the evidence on misleading descriptors suggests that it is actually the current, liveried packs that are doing so. Thus, Hoek (2006) argues, standardised packaging would actually enable informed consumer choice by removing erroneous perceptions about variations in brand strength.

Summary

It is clear then that there is good evidence to show that health warnings work, the pack can and is being used to promote the product and that consumers have been misled by pack design features. Logically plain packaging would be beneficial in each case: it would increase the prominence of health warnings; stop the pack being used to promote tobacco; and reduce (though not completely remove) the danger of consumers being confused by false claims.

Logical argument however is not the same as direct measurement. A series of studies have looked directly at both adult and youth response to plain packaging: these are now examined.

Early plain packaging research

Plain packaging was first suggested in 1986 and first examined in a marketing journal in 1987. Between then and the mid-1990s there were a number of studies conducted in this area; coinciding with plans to introduce plain packaging in Canada and New Zealand.

In Canada and the US plain packaging was assessed via 52 focus groups with 12-17 year olds (N=339) and a survey with 12-14 year olds (N=2,132) from Ontario and Chicago (Rootman & Flay, 1995; Northrup & Pollard, 1995; d'Avernas et al., 1997). Both qualitative and quantitative components of the study found that compared to branded packs, plain packs generated less positive imagery about the brand and smokers of the brand. In Ontario, recall of health warnings was improved by plain packaging only for regular smokers, with no difference among the Chicago sample; that health warnings were considerably smaller for US packs than Canadian packs, and are on the side panel rather than the front panel, might help explain these findings. Seriousness of health warnings was enhanced by plain packaging, although the authors report this as believability (Rootman & Flay, 1995; d'Avernas et al., 1997). This semantic error has been heavily criticised (Imperial Tobacco, 2008), but increasing the perceived seriousness of health warnings is an important benefit for public health. In Ontario, 25% thought that plain packs would result in young smokers smoking less, 35% that they would be less likely to start, 43% that they would turn people (like them) off smoking; no figures are given for the Chicago sample. An additional quasi-behavioural experiment was conducted in the Chicago focus groups (d'Avernas et al. 1997). Participants were asked to choose which pack they would most like to take home, from a choice of existing US packs with real, plain or novel pack designs. In terms of pack preference, none of the 12-13 year olds and only 6% of 16-17 year olds chose the plain pack. Most opted for the real pack (88% of 12-13 year olds and 73% of 16-17 year olds).

Beede et al. (1990) assessed plain packaging using 80 focus groups with 568 students in New Zealand (12-14 years), with the findings reported in two separate papers. Firstly, a factor analysis of the qualitative data was conducted to produce user-profiles of smokers of New Zealand and US branded and plain packs (Beede & Lawson, 1991). Seven distinct profiles were produced for the New Zealand branded packs, with similar profiles found for the unfamiliar US branded packs, with the authors suggesting that brand image formation is promoted through packaging even in the absence of prior knowledge of the brand or exposure to advertising. That plain packs produced no distinct user-profiles appears to support this assertion. Participants were also asked whether they thought plain packs would discourage smoking initiation among children, and in all age groups the majority believed that it would, with plain packs considered dull and boring and deterring curiosity and interest.

The second paper assessed perceptions of health warnings on New Zealand and US branded and plain packs (Beede & Lawson, 1992). Following the focus groups, packs were withdrawn from view and participants completed a survey which included an unaided recall exercise of packs seen. Recall of price, bar codes, contents and tar content was higher on plain packs than branded packs, and, for the US packs, recall of health warnings was significantly greater for plain packs than for branded packs. From these findings the authors conclude that health warning impact was greater on plain packs than branded packs. Critics have argued that the study did not explicitly assess the real or potential impact of health warnings – just recall (Imperial Tobacco, 2008). Nonetheless establishing that the recall of health warnings - and other standard information - is enhanced by plain packaging is an important finding.

The Centre for Health Promotion (1993) used surveys and focus groups to examine the effects of plain packaging on 12-17 year olds (N=129) across Ontario. Branded packs were considered more desirable than plain packs and associated with more positive images. About a half (53%) of non-smokers and a third (36%) of smokers, particularly younger and newer smokers, thought plain packs would decrease youth smoking. Following the study participants were allowed to choose a product as payment for participating in the research, including, among other things, cigarettes. Half of those aged 16 or 17 years old were offered a branded pack, the other half, a plain pack. While no significant difference was found, more males chose the plain pack over the branded pack. This study suffered from a small sample size which makes the finding questionable. The authors attribute it to a novelty effect; critics argue that as this is the only genuine behavioural component to the study it therefore discredits the conclusion that plain packaging makes the product less favourable - an argument that is itself criticised for conflating the pack with the product (Amit, 1994; Decima Research, 1994; Imperial Tobacco, 2008; Keegan & Co, 2008).

A much later study by Wakefield et al. (2008) supports the novelty explanation: it found that plain tobacco packs, which the vast majority of people will have never seen before, were considered more exclusive/expensive than branded packs. This novelty effect would presumably disappear if plain packaging became the norm.

An early market research study by Blotnick (described by Trachtenberg, 1987) also helps unpick the conflation of pack and product. Blotnick offered 1,546 American and European Marlboro smokers Marlboro in plain brown packs at half price. Only 21% of participants were interested in purchasing the plain pack even though they were assured that the product inside was identical to that in normal branded Marlboro packs, leading Blotnick to conclude, on the basis of qualitative research, that it is Marlboro's image that attracts most of its customers and not the product. Although it is difficult to draw any conclusions about the strength of this study as the methodology and full results are not described, the findings do support the conclusion from The Centre for Health Promotion (1993) that plain packs reduce expectations of the product.

The Centre for Behavioural Research in Cancer (CBRC, 1992a) conducted a number of studies across Australia to fulfil a brief by the Task Force on Tobacco Health Warnings and Contents Labelling. One component of their research was to examine the reactions of 12 to 20 year olds (N=66) to proposed changes to cigarette packaging. This qualitative study presented four modified packs to 22 small groups and recorded unstructured responses, both verbal and non-verbal, and opinions via semi-structured interview. All the packs were modified to show a more obvious health warning, more detailed information on health risks and revised contents labelling. Among the packs there were three plain packs, which were considered particularly unattractive and were recognised as an attempt to diminish positive associations to cigarettes. The authors conclude that plain packaging would be an important additional strategy to reduce positive images associated with smoking and believe that plain packaging may benefit adult smokers who have made the decision to quit or are actively trying to quit - however they also acknowledge that disapproval of plain packaging may not discourage smoking.

A supplemental survey with 1,310 Australian adults (aged 16 and over) was conducted to assess public opinion about these same pack modification proposals (CBRC, 1992b). Cards representing these modifications were shown via face to face interviews and in the case of plain packs, participants were shown three different sized plain light brown packs. Almost

half (49%) of participants said they would approve of laws requiring standardisation of packs and 39% disapproved. Disapproval was higher among smokers although approximately a third (37%) did approve the change. When those who disapproved were asked the question again, but in the context of plain packaging discouraging youth smoking uptake, approval increased to 87%, although social desirability bias may have influenced these findings. In a smaller sample (N=133) of 12 to 14 year olds 74% approved of plain packaging and 79% thought that all of the pack changes taken together (increased health warnings, revised contents information, plain packaging) would discourage them from smoking.

Bondy, Paglia and Kaiserman (1996) used the largest sample employed among this early research. As part of the 1994 Canadian Youth Smoking Survey (YSS) a representative sample of 14,270 children (10-14 years) participated in classroom surveys across Canada to examine identification of cigarette brands by colour and design alone and to test attractiveness of pack designs, including a plain pack. Almost all (95%) participants were able to identify at least one brand but while no particular brand was considered the most attractive, most (79%) considered the plain pack to be least attractive, supporting research that pack design produces positive imagery (Goldberg et al., 1995). Although not assessing brand imagery specifically, the findings from the YSS shows high youth brand awareness of cigarettes through pack design and the utility of plain packaging as a means of breaking the link between pack design and positive brand imagery.

It is widely accepted that the most comprehensive early plain packaging research was that of Goldberg et al. (1995). Using a national survey which employed a sample of 1,200 Canadian youth (aged 14 to 17 years), teenagers were found to be very brand aware, easily identifying brands from packaging alone. In terms of the effects of plain packaging, 13.5% of the sample believed plain packaging would result in a lot less teenagers starting smoking, 35.8% a few less and 29.9% a little less, and 38.2% thought that with plain packaging more teenagers would stop smoking. Frequent and regular smokers were more likely to believe plain packaging would make no difference. The authors concluded the impact of plain packaging would be greatest among those contemplating or experimenting with smoking.

The next two components of this study used the same sample to conduct word and visual image experimental surveys (Goldberg et al., 1995; Madill-Marshall et al., 1996). In the word image survey participants rated smokers of branded and plain cigarette packs on a number of semantic differential scales, e.g. cool-uncool. Three versions of packs were provided for two brands: one current, fully branded pack, one plain white pack and one plain white pack with a 'lungs' symbol. For both brands, participants viewed the 'lungs' pack most negatively, followed by the plain pack. The visual image survey used the same three packs for three brands and participants had to rate how appropriate the packs were for different person types. The findings show that any differences between which packs are appropriate for different types of people disappear with plain packs. From these two surveys the authors conclude that plain packaging reduces brand differentiation and the 'badge' value of the pack, as the link between brand and imagery is diminished. However Goldberg et al. caution that while plain packs reduce brand imagery, the image of a teen smoker will remain and teenagers will continue to smoke regardless of brand so long as this is an image they wish to convey.

The fourth component of the study was a health warning recall and recognition experiment. A sample of 400 young people (aged 14 to 17 years) who smoked or were contemplating smoking viewed images of three branded or plain white cigarette packs on a computer screen for four seconds. Each pack displayed one of three health warning messages. Although

unaided recall of the warnings overall was poor, there was a significant difference between recall on the plain pack (50%) and the regular pack (38%) for the message “Smoking can kill you”. In the aided recall exercise, participants were given health warning messages to match up with the packs they had viewed. More of the teenagers were able to correctly match the messages to the regular packs; attributed to a regular branded pack being a more meaningful cue than a plain pack (Goldberg et al., 1995). A later analysis of this data by Goldberg et al. (1999) showed recall levels to be higher on plain packs for the two shorter warnings: “Smoking can kill you” and “Cigarettes are addictive”. Recall for the third and longer message “Tobacco smoke causes fatal lung disease in non-smokers”, was adversely affected by the plain packs; 15% recall for the regular pack and 1% for the plain pack.

The fifth component of the study used a conjoint experiment to examine the effects of plain packs in the presence of other factors: brand information, price and peer influence (Goldberg et al., 1995). The sample used was the same as in the recall exercise, but included an additional 100 adult (30 to 40 years) smokers. Participants viewed pairs of packs and were then asked questions based on their smoking status: non-smokers were asked to indicate which pack would encourage them to start smoking while smokers were asked which would encourage them to stop. Six different packs were used: a regular branded pack, plain white pack, plain white pack with ‘lungs’, buff colour pack, pink colour pack and yellow-green colour pack. The analysis provided utility values for all of the different pack factors. For all participants, price had the highest utility value in terms of encouraging uptake or smoking cessation. For packaging, the ‘lungs’ pack was the pack least likely to encourage teens to start smoking, followed by the buff colour. Conversely, the ‘lungs’ pack was the pack most likely to encourage teenage and adult smokers to stop. The regular pack had the lowest utility values and therefore the least impact on encouraging cessation. However the major limitation of this type of research, highlighted by the authors, is the potential for bias occurring from demand effects. While perhaps not as relevant to the adult sample, the teenage sample conducted this experiment immediately after the recall experiment. If they realised its purpose, this may have resulted in correct guessing of responses. In the event of this Goldberg et al. note that the impact of the likely effects of the plain packages on smoking uptake would be over-estimated, while under-estimated for cessation effects.

Summary of early research

The early research on plain packaging of tobacco products presents consistent evidence to show that the pack livery does promote the product, increasing its appeal and strengthening brand image, and that plain packaging would prevent this. The research also shows that the health warning is less prominent and taken less seriously on branded packs compared with plain packs. In addition, several studies have shown that people – including smokers – support the idea of plain packaging and think that it would help adult smokers quit and prevent children starting. No early studies looked at the impact of plain packaging on misleading descriptors and creative devices.

These early studies have both geographical and methodological limitations. Geographically, they were almost all conducted in North America or the Antipodes. However these are English speaking and culturally similar to the UK and there is no obvious reasons why results should not, therefore, apply here. Methodologically, the studies were experimental, thus vulnerable to the criticism that they do not tell us enough about what would happen in real life circumstances. Nor are there any studies which use the sort of longitudinal designs that make it possible to tease out cause and effect relationships.

In addition, the focus of much of this early research was to examine youth responses to plain packaging. While the primary objective of plain packaging as framed by the Department of Health is to reduce youth smoking uptake, regular smokers who have made the decision to quit, or are actively trying to quit, have also been identified as a potential target group who could be affected by plain packaging in terms of smoking cessation (CBRC, 1992a). The early research pays only limited attention to adult populations who are much more likely to fit into this category.

Recent plain packaging research

Our review suggests that just over a decade elapsed between the first and second waves of plain packaging research. Since 2007 however numerous studies have assessed plain packaging and we provide a brief overview of these, focusing more on unpublished and on-going research given that most of this information has not been previously available.

Hammond et al (in press) assessed, via an online survey, youth (N=806) and adult smokers (N=516) perceptions of taste (smoothness), tar delivery, health risk and attractiveness of 14 pairs of cigarette packs, with each pair differing on one design element (e.g. brand name, colour, plain packaging). Adult smokers were also asked, in each case, about which one of the two packs would make quitting easier, and young people were asked about which pack they would choose if trying smoking. Six of the 14 pairs of pack included plain packs, which were either compared against branded packs or other plain packs with a slightly different brand name. It was found that plain packs (white or brown) were viewed as considerably less attractive than branded packs, with adults considering it easier to quit with plain packs and youth less likely to choose this pack if trying smoking. For adult smokers, white plain packs were considered to have a smoother taste and lower health risk than the branded packs. This was not the case for brown plain packs and youth did not perceive either plain pack to have a smoother taste. When plain packs were compared against each other, with only brand name differing (Mayfair Smooth vs Mayfair King Size, L&B gold vs L&B King Size), it was found that the packs labelled Smooth or Gold were perceived to be more attractive, have a significantly smoother taste, lower tar delivery and lower health risk. These packs were also considered to make quitting easier for adults and to be the packs that youth would choose to try smoking. This highlights the potential effect that brand name could have in the event of standardised packaging and the study clearly demonstrates, consistent with past research, that consumers are misled about the supposed safety of certain cigarette brand variants by brand descriptors and colours.

Two Australian studies have also used a web-based methodology, this time involving participants (813 adult smokers and 1,087 youth smokers and non-smokers aged between 14 and 17 years) from a national online sample viewing a single randomly selected cigarette pack and rating it on a series of pack, user and product related measures (Wakefield et al., 2008, Germain, Wakefield & Durkin, in press). In each study, participants were shown one of three popular Australian brands of cigarettes, but some were shown normal branded packs and some plain packs. Three plain packs were shown for each brand to demonstrate increasingly plainer packs (e.g. with brand names appearing as they do on the branded pack, with brand names standardised and appearing on the middle of the pack front, or with the number of cigarettes contained within each pack appearing on the middle of the pack and brand name at the bottom of the pack). For both studies, plainer packs, with increasingly fewer branded design elements, were perceived to have less favourable pack characteristics (e.g. attractiveness, value) and smoker characteristics (e.g. trendy, young, confident). The authors acknowledge that neither study was representative of youth or adult populations, and the limitations associated with using web-based research (e.g. respondents cannot touch the pack). However, by comparing plain packs with other plain packs for the first time, something that had been previously lacking in this type of research (Keegan & Co, 2008), these studies allow an insight into perceived differences between plain packs with and without standardised brand names; in both cases packs with standardised brand names were viewed more unfavourably on most pack and smoker characteristics (Wakefield et al., 2008; Germain et al., in press).

Two studies were commissioned by Health Canada in 2008 to examine the impact of increasingly larger pictorial health warnings and also plain packaging. In the first study a non-representative sample of 1000 young people (aged 12 to 18 years) were recruited via a database of individuals willing to participate in research and supplemented by random calling, intercept recruiting and referrals (EnviroNics Research Group, 2008a). Each respondent was exposed to four branded packs (each with a pictorial health warning covering 50, 75, 90 or 100% of the pack) and two plain packs (each with a pictorial health warning covering 50 or 75% of the pack). A second study, using the same methodology, was conducted with 1000 adult smokers (EnviroNics Research Group, 2008b). Three-quarters of youth could recall the brand name on branded cigarette packs with warnings covering 50 and 75% of the pack, compared to approximately 80% for plain packs displaying warnings of the same size (over 90% for adults in both instances). When comparing branded and plain packs with warnings covering 50 or 75% of each of the packs, it was found that youth considered plain packs to be twice as effective as branded packs in informing of the health consequences of smoking, with adult smokers considering them more than twice as effective. It was also found that youth perceived that plain packs would be more than twice as effective at reducing tobacco consumption compared with branded packs, with adult smokers considering them almost three times more effective (EnviroNics Research Group, 2008a; EnviroNics Research Group, 2008b).

Hoek, Gendall and Louviere (2009) postulated that, consistent with behavioural modification theory, familiar brand imagery would elicit learned responses and expectations that both reassures smokers and limits the salience and effectiveness of competing stimuli such as pictorial health warnings, and that plain packaging would remove the reassurances that branding provides. An experimental design was used where college students (N=245) were asked to picture an imaginary scenario where they were new to university and lived in a hostel. They were asked to imagine that they had created a new network or friends with whom they smoked socially, and had to select which pack (familiar pack with text or pictorial warning, unfamiliar pack with text or pictorial warning, plain pack with text or pictorial warning) they would most likely buy to share with their new friends. Both smokers and non-smokers were most likely to choose familiar and unfamiliar brands with text warnings, followed by either the familiar brand with pictorial warnings (non-smokers) or the plain pack with text warnings (smokers). The two packs viewed most negatively among both smokers and non-smokers were the unfamiliar brand with pictorial warnings, and by a considerable margin, plain packs with pictorial warnings. Although the study can be criticised for its small sample size (only 51 smokers) and the imaginary scenario, which involved non-smokers purchasing cigarettes, which could be seen as unrealistic, the findings do suggest that plain packaging can decrease the attractiveness of packs beyond that of pictorial health warnings.

Unpublished and ongoing research

A number of other studies assessing plain packaging have been conducted across Europe and North America within the last three years. In France for instance, six focus groups were conducted in Paris, Brest and Rennes in 2007, with 25 male and 25 female smokers and non-smokers aged 15 to 46 years (Gallopel-Morvan, 2008). Compared to normal Marlboro packs, white, brown and grey plain packs, with Marlboro printed in a standardised black font in the centre of the pack, were considered to significantly reduce the attractiveness of the pack (particularly the grey plain pack which has been used in many subsequent French studies).

Other qualitative research in Nantes, with 7 males and 9 females (aged 15 to 24 years) and using the same methodology, also found that the plain (grey) Marlboro pack was considered to be a useful way to help prevent youth initiation and help smokers quit, and increase the visibility of health warnings (Comité National Contre le Tabagisme: CNCT, 2007).

In a third study in Paris in 2007, 10 male and 10 female smokers and non-smokers (aged 18 and 45 years) were individually interviewed. Participants were shown a branded Marlboro pack, a grey Marlboro plain pack with text warnings, and a grey Marlboro plain pack with text and pictorial warnings. It was found that the normal Marlboro pack was perceived as more attractive than the two plain packs, which were considered 'ugly' and 'sad'. The plain packs were also viewed as highlighting the health warnings, particularly plain packs with pictorial warnings (CNCT, 2008a). A fourth qualitative study in Paris in 2008 used six focus groups with a total of 34 smokers, ex-smokers and non-smokers from one of three age groups (15-24, 25-34, 35-45). Participants were shown a branded Marlboro pack and a grey Marlboro pack. The plain pack was, as with the earlier CNCT study, considered 'ugly' and 'sad' in comparison to the branded pack, and enhanced the visibility of health warnings. The majority of the sample favoured introducing plain packaging and thought that it would contribute to a reduction in tobacco consumption, help motivate smokers to quit, and, especially, act as a deterrent to youth smoking initiation (CNCT, 2008b).

An experimental study in 2008, employing 680 French smokers and non smokers aged 15 to 25, involved participants being exposed to one of five cigarette packs: an attractive pack (Gauloises), a branded Marlboro pack, or a white, grey or brown plain pack. Compared to the two branded packs, plain packs were perceived as significantly less attractive, cheaper looking, of poorer quality and likely to reduce the motivation to buy cigarettes. Plain packs also increased recall of health warnings (Gallopel-Morvan et al., 2009). A subsequent experimental study examined the possible impact of pictorial health warnings and plain packaging, with a representative sample of 905 smokers and non-smokers aged 15 to 46 years (Gallopel-Morvan, 2009). The sample was shown one of six Marlboro packs displaying either textual or textual/pictorial warnings. Two groups were exposed to normal branded Marlboro packs, two groups were shown plain white Marlboro packs and two groups plain grey Marlboro packs. Compared to those shown branded packs with text warnings, those shown plain packs (either white or grey) with pictorial warnings were significantly more likely to say they would encourage cessation (make smokers want more to quit smoking, and less likely to take a cigarette, and make people think more of the dangers of tobacco) and discourage initiation (reduce desire to start smoking among teenagers). However it is not possible to say whether the difference was due to the plain pack, the pictorial warning, or both.

In another French study, using Computer Assisted Personal Interviewing, 836 adult smokers and non-smokers (aged 18+) were shown five different sets of tobacco packs (plain pack on its own, plain pack and Marlboro pack, and then the plain pack and two Camel, two Lucky Strike and finally two Gauloises packs). The plain pack (grey), when viewed on its own was considered ugly (63%) and boring (77%) and not worth buying (66%). When compared with the Marlboro pack, the plain pack was considered to be more effective for preventing youth from starting smoking (66% for the plain pack vs 11% for branded Marlboro pack) and more effective for motivating smokers to reduce consumption (63% plain pack vs 6% for Marlboro pack) and quit (61% plain pack vs 7% for Marlboro pack). The sample was then shown the plain pack together with either two Camel, two Lucky Strike and two Gauloises packs (in each case a normal pack and a limited edition pack) and asked a series of questions based

upon each set of three packs. In each case the plain packs, when compared to the branded packs, were viewed as considerably less attractive, less likely to motivate youth to purchase the pack and more effective at motivating smokers to quit (CNCT, 2009). In all cases the limited edition packs, which are increasingly common in the UK (Moodie & Hastings, in press^a), were viewed as most attractive and least likely to prevent initiation and promote cessation.

Remaining within Europe, a recently completed Spanish study employed qualitative research (31 interviews, 8 focus groups) and assessed perceptions of pictorial warnings, when compared to text warnings, and perceptions of plain packaging (white, grey or brown) with either text only or text/pictorial warnings (Rey, unpublished manuscript). The focus group sample were segmented by age group (15-24, 25-34, 35-45), gender and smoking status and considered the plain packs, which had printed in a standard font on the pack front either Fortuna (youth brand), Nobel (female brand) or Marlboro (male brand), as less attractive, particularly by 25 to 34 year old women. Plain packs were also considered by focus group participants to increase the salience of health warnings; reflecting the earlier interview findings (Rey, unpublished manuscript).

In North America, Doxey and Hammond examined female perceptions of packaging and standardised packs in Waterloo (Canada) with a sample of 512 young adults (aged 18-25 years). Participants completed an online survey in which they viewed a series of eight packs designed according to one of four conditions: branded female-oriented pack; branded female-oriented pack with descriptors (e.g. Slims) removed; non-branded (plain) female-oriented pack with brand imagery and descriptors removed; and branded male oriented pack. Participants rated each of the packs on perceptions of appeal, taste, tar, and health risks, and psychosocial predictors of smoking. Results indicated that women rated the fully branded female-oriented packs as significantly more appealing, and more likely to be associated with positive attributes (such as glamour, slimness, sophistication) than plain packs. Women who viewed the normal branded female packs were more likely to believe that smoking helps people control their appetites compared to women who viewed the male oriented or plain packs (Doxey & Hammond, unpublished manuscript).

Another Canadian study assessed plain packaging with a sample of 408 adult smokers and 379 adolescent (aged 16-18 years) smokers and non-smokers (Hammond & Lee, unpublished manuscript). Participants recruited by mall-intercept, viewed pairs of packs that were either normal branded packs, packs with descriptors removed, standardised packs with other brand imagery removed and standardised packs with descriptors removed. The main findings, that were generally consistent across youth (both smokers and non-smokers) and adults were that; preferred brand for smoking was branded packs rather than plain packs; recall of health warnings was higher on plain packs; false health beliefs about packs with brand descriptors such as Smooth were apparent on both branded and plain packs; removing colour and other imagery reduced false beliefs about the health risks associated with these products; youth considered cigarettes in tall skinny packs less harmful than those in regular packs.

A replication of this last study with almost 400 adults (200 non-smokers, 197 smokers) has been conducted in New York (Bansal-Travers, unpublished manuscript). The study examined smokers and non-smokers perceptions of health risks based on the systematic manipulation of two main features of cigarette pack design: pack characteristics (i.e. shading, descriptor term, plain packaging) and warning label format (size, style, framing and source attribution), while controlling for other factors. All participants were randomly presented with 12 sets of packs,

with each set differing according to a particular design feature. In one manipulation, a plain pack is compared to a branded pack, with over 90% of participants considering the plain pack the least attractive and most unappealing to youth, with over 50% stating the branded pack is the one they would purchase, and the one that delivers the smoothest taste.

Thrasher, Rousu and Hammond (unpublished manuscript) examined estimated differences in demand and cognitive impact of cigarette packs with different health warning label formats. Four health warnings with the same text message (Smoking causes mouth cancer) were designed; 1) text warning on 50% of one side of the pack; b) text warning on 50% of both sides of the pack; c) pictorial warning on 50% of both sides of the pack; and d) pictorial warning on 50% of the front and back of the pack but on a plain pack with only brand name and descriptors in original font. A total of 500 adult smokers were recruited from supermarkets in four U.S. states to participate in an experimental auction of packs, in which participant bids reflect product demand. In two sequential rounds, participants bid on the most popular pack within their preferred product class (i.e., Marlboro Red, Marlboro Light, or Newport), with two of the four possible warning label conditions randomly selected for each round. Once the bidding ended, participants were asked questions on their reactions to each warning on which they bid. Preliminary analyses of half the sample revealed that the mean price that smokers were willing to pay for each pack decreased across the four conditions, with smokers willing to pay significantly more for branded packs with smaller or larger text warnings than for packs with pictorial warnings on branded packs, and the least amount for plain packs with pictorial warnings.

Research is currently on-going in Belgium examining youth attitudes to plain packaging using qualitative research (Fraeyman, University of Antwerp), with findings expected in December. Doxey and Hammond are currently replicating their Canadian study assessing standardised packs and female perceptions of packaging in the US, with findings expected in October. An on-going experimental study by Hammond in Ontario, assessing the impact of standardised packaging, brand descriptors, and pack shape and size on perception and brand appeal among Canadian youth (aged 14 to 19 years), has employed the largest sample used in recent plain packaging research (between 10 and 16,000); with the expected completion date December. An international study by the ITC team investigating standardised packaging in seven countries (India, Germany, US, China, Mexico, Bangladesh and South Korea) will begin next month in India and Mexico, and will continue for the next three years.

Summary of recent research

Recent studies on plain packaging essentially confirm earlier research and add more detail. Thus they confirm that plain packs are less attractive than branded packs to both adults and children; they make people feel it would be easier to quit and less appealing to start; and they undermine brand values. In addition the recent studies show that brown makes a less attractive colour for plain packs than white (the latter is associated with smoother and lighter taste by some adult smokers); that there is a reduced potential for consumers to be confused about the health risks of smoking by plain packaging; and that even with familiar brand names, plain packaging still undermines brand values.

The newer studies also confirm that plain packaging can boost the health warning and suggest that the strongest combination for most smokers is a plain pack with a pictorial warning. Finally, the newer studies also extend the evidence base to more countries taking in continental Europe as well as North America and the Antipodes.

However the key weaknesses of the earlier studies remain: there is no ecological or longitudinal research thus real world applicability and direct causation have not been assessed.

Summary and Conclusions

This review set out to answer two questions:

1. What is the current state of the evidence base, and does it support a move to plain packaging?
2. What are the gaps in the literature and are there areas where it could be improved?

The state of the evidence base

There is solid research evidence to show that health warnings do deliver real health benefits, the pack can and is being used to promote the product and consumers have been misled by pack design features. There is a good rationale, therefore, for concluding that plain packaging would bring benefits in each of these areas.

Studies that have set out to take direct measurements of the impact of plain packaging on smokers and potential smokers also suggest it brings benefits in all these areas. Numerous studies have shown that plain packs are significantly less appealing than branded ones to both young people and adult smokers; would discourage the former from starting to smoke and encourage the latter to quit and that these results maintain even with well known brands. Plain packs are also less likely to be deceptive and have been shown to make the health warning more prominent and persuasive. In addition they receive a lot of support from smokers as well as non-smokers.

Much of this research has been done outside the UK, but it has covered many culturally similar locations across North America, the Antipodes and continental Europe. There is no reason to think that people in Britain – whether smokers or non-smokers – would respond any differently.

Research weaknesses and gaps

There are three significant weaknesses in the research base. First, all the studies have been experimental: no ecological or ‘real world’ research has been conducted to see what actually happens when, for instance, smokers use generic packs over a period of time. Would their negative perceptions persist? Would they return to the era of cigarette cases? Would the tiny differences evinced by a different brand name quickly become much more important (much as Americans become very adept at spotting small variations in the different denominations of dollar bills)?

Second, no longitudinal studies have been conducted which might be capable of disentangling cause and effect. To some extent, this is a ‘Catch 22’: it is difficult to see how such a study can be done until plain packaging is actually introduced, as there is no obvious way of simulating its impact on a long term basis. This then is a gap that cannot be filled prior to making the policy decision. However, as with tobacco advertising, it should be possible to conduct a study examining the relationship between packaging awareness and familiarity and smoking knowledge, attitudes and behaviour. If the pack is a determinant of smoking one would expect that awareness of, familiarity with and appreciation of the pack would correlate with and predict pro tobacco perceptions and the onset of smoking.

The third gap is in the field of product standardisation, which has received little attention. To some extent, research on the pack impinges on this as the pack limits the opportunity for altering the size of the product, but other variables could be manipulated including colouring, flavour and smell; indeed perfumed cigarettes were discussed in UK tobacco industry marketing documents (CDP, 1995).

In addition it is important to recognise that this has been a very rapid review exercise, and whilst we are reasonably confident about coverage, a more thorough and systematic review is needed.

In the light of these comments there is a need for a number of additional studies:

- *Systematic review*: Following on from this preliminary, time constrained, review a more comprehensive systematic review is warranted.
- *Ecological research*: One of the main criticisms of the literature is the absence of research in real-life settings. It is difficult to see how this could be done ethically with young people, but research exploring the use of plain packs by adult smokers in their daily lives would extend the evidence base.
- *Longitudinal research on the current impact of tobacco packaging on smoking*: This would replicate studies on tobacco advertising and examine the relationship between packaging awareness, familiarity and appreciation with smoking knowledge, attitudes and behaviour. A longitudinal design would make it possible to tease out cause and effect relationships.
- *Research on product standardisation*: Future research methodologies assessing plain packaging should consider assessing the possible promotional impact of the colour, size, smell and shape of tobacco products.
- *Research on other tobacco categories, especially roll-your-own (RYO) products*: No research, of which we are aware, has examined the use of standardised packaging for cigars, pipe tobacco or RYO tobacco. Although cigars and pipe tobacco represent a small share of the tobacco market in the UK and are not commonly used by youth, RYO continues to gain market share and is being used more by price conscious youth. Furthermore, the novel pack designs and innovative packaging used on cigarettes in recent years have also been used for RYO products, for instance, RYO tobacco in cigarette shaped boxes rather than pouches, smaller and larger pack size and ‘metallic’ pack designs (Moodie & Hastings, in press^a).
- *Technologically assisted experimental research*: Both early (e.g. Rootman & Flay, 1995) and recent research (e.g. Thrasher et al., unpublished manuscript) examining the relationship between health warnings and plain packs have been largely unable to extricate the individual impact of each, although recent research indicates that the pictorial warning/plain pack combination is almost certainly the most effective means of eliciting more negative perceptions of the pack, the user and the product (Wakefield et al., 2008; Hoek et al., 2009; Germain et al., in press). To bridge the gap between psychological perceptions and physiological processes, these findings could be augmented by using eye-tracking technology and psychophysiological measures of autonomic arousal (such as heart rate and skin conductance).

- *Consideration of listed ingredients on packs in addition to, or instead of, current numerical yields:* Although it has been suggested that constituent levels of tar, nicotine and carbon monoxide (which are subject to Article 5 of the EC Tobacco Products Directive) are misunderstood by smokers (Cohen, 1996; European Health Research Partnership and Centre for Tobacco Control Research, 2002) and should be removed from packs as they provide consumers with misinformation about the supposed safety of tobacco products (Slade, 1997; McNeill, Joossens & Jarvis, 2004), this issue has not been addressed in plain packaging research. As constituent levels on standardised packs may assume even greater importance in guiding brand choice, given that all other pack elements will be standardised, research exploring smokers' perceptions of standardised packs with either current ingredients displayed or with general information about the chemicals contained within tobacco (as in Canada), would help clarify the best way, if any, of displaying product constituents.
- *Consideration of standardised brand name:* Australian research (Wakefield et al., 2008; Germain et al., in press) has provided an insight into the possible impact of standardising brand names (font, size and style) on plain packs, and research in the UK has demonstrated how even the use of different brand names on otherwise identical plain packs can greatly influence perceptions of attractiveness and safety, but these findings should be supported with further research employing non web-based methodologies.

Conclusions

There are good logical arguments in favour of plain packaging. Research has shown that health warnings work, and the pack is an important tool for promoting tobacco which has been used to deceive smokers. It is reasonable to expect that plain packaging would boost the first and reduce the latter two.

There is also good experimental evidence to confirm these conclusions. A variety of studies using both qualitative and quantitative methods and conducted in a range of different countries have consistently shown that plain packs are less appealing to both children and adults, make health warnings (especially pictorial ones) stand out more and reduce the danger of consumers being deceived about the relative risk of different products. Plain packaging has also been shown to be a popular idea, particularly if it is implemented to protect the young.

However there are also important gaps in the evidence base. In particular there have been no ecological studies to examine the real world effects of plain packaging nor have there been any longitudinal studies to assess the cause and effect relationship between packaging and smoking.

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