APPENDIX A

Summaries of individual research studies
BACKGROUND

This section provides a summary of articles relied upon in the evidence review. The summaries provided below include verbatim excerpts from published abstracts that have been modified for the purpose of the summary tables.

**Purpose**
To investigate adolescent attitudes toward cigarette packaging (i.e. use of a brand name, colour scheme, logos and symbols, etc.) and better understanding of the “promotional” impact generated by cigarette packaging.

**Methods**

**Study design**
80 focus group interviews conducted over a 3-week period examined associations developed between packaging stimuli and respondents’ perceptions about both the brand and the product. A literature review was used to find relevant variables to be considered.

**Sample**
N=567 male & female adolescent students (average 13 yrs; range 12-14 yrs).

**Location**
New Zealand

**Analysis**
Packaging stimuli were classified into two distinct categories; one set of stimuli represented normal market packages while the second set represented “generic” or “plain-pack” packaging. Plain-packs were produced in typical generic form and were consistent across all brands, excluding the actual brand name.

**Results**
Results indicated that respondents develop substantially different associations and stereotypes relative to different brand stimuli. While branded packs elicited very distinct user profiles, respondents exhibited a lot of difficulty in differentiating user profiles of plain-pack brands. Compared to branded packs, the overall lack of cues available on the plain-packs resulted in a shift of respondents’ evaluations from the brand level to the product category level.

**Purpose**
To examine the impact of plain packaging on recall of health warnings and brand information.

**Methods**

**Study design**
A school-based survey was conducted, within the context of 80 focus groups conducted in-classroom. Cigarette packs were obtained and constructed for the purpose of discussion during the focus group interviews. Brand packs from New Zealand and the USA were obtained and plain packs were constructed to the same physical specifications of their branded counterparts. Each plain pack was completely devoid of colour and other brand markings, except for the brand name, which was presented in a plain typeface standard to all plain packs. Following group discussions aimed at developing user profiles for the three types of cigarettes, the packs were withdrawn from view and students were asked to illustrate the packs they had observed. Three response sheets were provided, each containing the outline of the front face and left and right sides of a blank pack. The students then proceeded to draw in as many details about each pack as they could recall. This task was completed individually and unaided. An aided recall task followed in which students were provided with a list of 10 health warnings. Five of these were fictitious, four represented warnings from New Zealand cigarette packs used in the experiment, and the last is in use in general cigarette advertising in New Zealand. The students were asked to indicate any health warnings that they had seen during the experiment.

**Sample**
N=568 adolescents in “third form” school; mean age=13

**Location**
New Zealand

**Analysis**
Statistical significance levels are reported, most from using chi-squared tests, although the descriptions of the statistical tests are not reported in the paper.

**Results**
Recall of health warnings was significantly greater for plain packs compared to regular packs in both the “aided” and “unaided” recall tasks. Recall for other types of pack information was also higher in plain packs, including the position of the health warning, position of the UPC code, pack contents, and the tar and nicotine level printed on packs. No differences in the recall of brand names were observed between “regular” and plain packs.

Purpose
To assess whether standardised packs of the form introduced in Australia are associated with a reduction in acute craving and/or an increase in motivation to stop, and to replicate previous findings on perceptions of packaging, perceptions of smokers using it and perceived effects on behaviour.

Methods
Study design
Following abstinence of at least 12 hours, 98 regular and occasional smokers were randomised to exposure to their own cigarette package, another branded package or a standardised package. Main outcomes included craving (QSU-brief), motivation to stop (MTSS), both at baseline and post-exposure. Ratings of 10 attributes concerning package design, perceived smoker characteristics and effects on behaviour, post-exposure only.

Sample
N=568 adolescents in “third form” school; mean age=13

Location
New Zealand

Analysis
Mixed model ANCOVA.

Results
For craving, a mixed model ANCOVA showed a significant interaction of packaging and time of measurement (F(2,94)=8.77, p<0.001, partial η2=0.16). There was no significant main effect or interaction for motivation to stop smoking (p=0.9). The standardised pack was perceived to be significantly less appealing and less motivating to buy cigarettes, smokers using them were perceived as less popular and cigarettes from them expected to taste worse.
Centre for Health Promotion. Effects of plain packaging on the image of tobacco products among youth. Centre for Health Promotion, University of Toronto, 1993.

**Purpose**
To describe the results of a collection of qualitative data, quantitative data, expert opinion, and theory to assess the impact of plain packaging on imagery projected by the cigarette package, and the impact of plain packaging on tobacco use among current smokers and those contemplating smoking aged 12-17

**Methods**

**Study design**
21 Focus Groups in 3 Ontario cities. Focus groups were conducted separately for boys and girls, for subjects aged 12-15 and 16-17, and for non-smokers (contemplating starting) and smokers (regular and experimental). Group interviews consisted of two components: a *structured interview* (quantitative data collected on an individual basis) and *focused discussion* (qualitative data examined on a per group basis). “Plain” packs included brand names along with health warning and UPC code against two “plain” backgrounds: either white or “buff” (a dull yellow/brown).

**Sample**
N=129
- Youth 12-17 (n=129)
  - Smokers n=97
  - Non-smokers n=32
- Males n=61
- Females n=68

**Location**
Canada

**Analysis**
Qualitative analyses involved reviewing video tapes from all sessions and group meetings of the three group facilitators to arrive at common themes and conclusions. For quantitative data, one-way analysis of variance procedures were conducted on the average attribute ratings of cigarette packages to detect differences across age and gender, within the smoking and non-smoking focus groups. In addition, paired T-tests were performed to detect differences between the average ratings assigned to the brand versus plain packages of cigarettes. Chi-Square tests of significance were performed to detect differences in the level of recall of brand name information across age and gender within the smoking and non-smoking focus groups. Chi-Square tests were also performed to detect differences in recall between brand and plain packages of cigarettes.

**Results**
Plain packaging was regarded as significantly less appealing across all tasks and in the general discussion. For example, plain packs were regarded as “cheap” and the quality of the cigarettes was also questioned because of this (cheap, stale, substandard in some way). All focus groups strongly disliked the plain packages; buff colour was seen as worse than white, because buff is seen as “old” or “antique” even “death”, while white gives the impression of cleanliness. Plain packaging makes smoking look “more serious” – not fun (more death-like, or like a prescription medicine box). The image of people who would smoke cigarettes in plain packages was also strongly negative, as opposed to many of the positive attributes associated with smokers of branded packs. Plain packs were associated with lower value, as measured by questions related to the price that respondents would pay for the package.

Significant proportions of smoking and non-smoking youth reported that plain packs would reduce smoking for their age group. Non-smoking respondents in the youngest age group, 12-15 year-olds, were most likely to believe that plain packs would reduce smoking (approximately 70%). Participants were offered either the plain or regular packs, with no significant differences in the proportion that chose the plain or regular pack; however, a significantly greater number of males chose the plain pack. No significant differences in “brand recall” were observed between branded and plain packages.

Purpose

1. 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 the non-smoking teens’ perceptions of “which cigarette encourages you most to start smoking.”

2. 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 the smoking teens’ perceptions of “which cigarette encourages you most to stop smoking.”

3. 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 the adult smokers’ perceptions of “which cigarette encourages you most to stop smoking.”

4. To use the obtained utility estimates for the teen smoker, teen non-smoker and adult samples to stimulate the potential impact of each version of plain and generic packaging.

Methods

Study design
Adaptive Conjoint Analysis (ACA) (computer-administered). Pairs were presented until certainty about the participant’s utility values reached a statistically acceptable level (alpha = 0.05). In this version of a hybrid approach, the respondents were first asked to rate separately the importance of each attribute level for each attribute. They were then asked to rate the importance of each attribute compared with the other attributes. Their responses to these questions were used to develop a preliminary model of the respondents' utilities for each attribute and each level of each attribute. Then the computer algorithm selected a pair of products with attribute levels that should most reduce uncertainty about the respondents' utilities. The respondents indicated a preference between the first pair. The computer then instantly recalculated the respondents' utility model in order to select next pair of products with attribute levels that again would best reduce uncertainty about the respondents' utilities. This process continued and additional pairs were presented until certainty about the respondents' utility values reached statistically acceptable level (α=0.05). If respondents were inconsistent in their judgments, additional pairs were presented until a researcher-determined preset maximum of pairs was reached. For this experiment the preset maximum was set at 30 pairs. Several leading brands and package types were examined, including “regular” packaging, plain white, lungs + plain white, buff, pink and yellow-green.

Sample
N=495
- Teen non-smoker (n = 195)
- Teen smoker (n = 203)
- Adult smoker (n = 97)

Location
Canada (Vancouver)

Analysis
Adaptive Conjoint Analysis (ACA).
Results

All participants perceived price to be the most important attribute influencing uptake or cessation of smoking. Package type (current vs. plain) was found to be as important or more important than brand influence with respect to uptake or cessation of smoking, and more important than peer pressure, except for teenage non-smokers. “Lungs” package was rated highest for utility in cessation or prevention of uptake of smoking. There was little difference between the 4 other plain designs. “Lungs” package had a stronger influence for females than males; impact of plain packaging would be uneven across the population.

**Purpose**
To assess knowledge, attitudes and beliefs among smoking and non-smoking youth regarding smoking, brands, plain and generic packaging, and perceived impact of plain packaging.

**Methods**

**Study design**
National Survey. Mall-intercept interviews were conducted in 15 Canadian cities spanning 5 regions.

**Sample**
N= 1200; 14-17 years old
Males = 601 Females = 599

**Location**
Canada

**Analysis**
Chi-square tests were used to compare proportions.

**Results**
59% of teens reported that teens would smoke the same amount if plain packaging; 36% reported that teens would smoke less, and 5% reported that plain packaging would increase smoking. There was an association between smoking status and whether they believe that such packaging would affect the amount that teens smoke: frequent/regular smokers were more likely to report that plain packaging would make no difference, whereas vulnerable/naive, smoking experimenters were more likely to say that teens would smoke less. 25% reported that plain packages would “bother them.” 49% believed that a few less teenagers would start smoking as a result of plain packaging. 38% say many more teens would stop smoking if cigarettes were only sold in plain packs. 46.8% believe that increasing cost of cigarettes would work best to stop young people from smoking; 5.6% said making packs less colourful.

Purpose
To assess teenagers’ attention to different aspects of cigarette packages, in particular attentional differences that might occur as a function of the nature of the package, either the package currently available on the market or the plain white package with minimal brand identification.

Methods
Study design
Between-subject design in which each respondent was exposed to only one package type (plain white or the current package) for each of three brands. Participants viewed a total of three images projected one at a time on a computer monitor. Each image was displayed for four seconds and showed a tabletop with four items on it: a can of soda pop, a bottle of a headache remedy, a magazine, and a cigarette pack. For each image a different brand of each product was displayed. The three cigarette brands displayed were: Matinee, du Maurier and Player’s. Half the subjects saw the three cigarette brands in their current packages. The remaining half saw the three cigarette brands in the plain package, with minimal brand identification. After each image was displayed the subjects were asked to complete both aided and unaided recall tasks related to the packs’ appearance.

Sample
N= 400 teenagers (all of whom smoked or were seriously considering starting smoking in the next year).

Location
Canada (Vancouver)

Analysis
Chi-square tests to examine differences across experimental conditions.

Results
66% of teens recalled seeing the du Maurier brand, less than 3% recalled seeing Players or Matinee. 82% of those who saw branded du Maurier package could recall the name, while 51% of those who saw the plain package could recall the name. More subjects recalled “smoking can kill you” warning when it was displayed on a on a plain package vs. a Players package.

**Purpose**
To determine if plain packaging can change the images associated with cigarettes and cigarette smokers, and reduce differences in perceived images associated with different brands and therefore then decrease the badge value and self-definition that accompanies brand choice in youth.

**Methods**
**Study design**
Mixed experimental design with 2 within-subject variables (package type; image consistency), and 3 between-subject variables (brand; question order; question place within questionnaire). Study was integrated into a national survey. Participants were shown brands according to experimental condition and asked to associate packages with certain images, such as a sophisticated woman, a teenage boy, etc. Packages include both “current” branded packages, plain packages, and packages with the “lungs” symbol.

**Sample**
N=1200 youth 14-17 years old
Males = 601 Females = 599

**Location**
Canada

**Analysis**
General linear models procedure for a repeated measures ANOVA. Main effects and higher order interactions were examined to assess the overall pattern of results.

**Results**
Associations of certain brands (e.g., DuMaurier) with certain individuals (teens vs. fishermen) disappear when plain packaging is used. These results were reproduced for all contrasting groups of individuals.
**Purpose**

To determine whether teenagers see image differences depending on whether a brand is packaged in the current package, a plain white package, or a plain white package with a “lungs” symbol; to determine whether teenagers see image differences depending on whether a teenager smokes cigarettes of any type, or smokes a particular brand, in this case either du Maurier or Matinee, two leading Canadian brands.

**Methods**

**Study design**

Participants were recruited through a national survey and split into two group (n=600 in each). Participants were asked about their impression of teenagers who smoke cigarettes (no brand specified) and teenagers' impressions of teenagers who smoke two brands of cigarettes – du Maurier (the top brand that teenagers know about and smoke), and Matinee (a much less well-known brand among teens), packaged in three alternate package types. All respondents were asked to complete the statement, "In general, teenagers who smoke cigarettes are..." This statement was followed by 15 nine-point semantic differential items (e.g., insecure/secure; uncool/cool; mature/immature) and respondents were instructed to circle a number for each item that would describe their impressions of teenagers who smoke cigarettes. To assess teenagers' impressions of teens who smoke du Maurier and Matinee in different package types, respondents were subsequently asked to complete the statement, "In general, teenagers who smoke du Maurier (or Matinee) cigarettes packaged this way are..." This statement was followed by 15 nine point semantic differential items (e.g., insecure/secure; uncool/cool; mature/immature) and respondents were instructed to circle a number for each item that would describe their impressions of teenagers who smoke du Maurier (or Matinee) cigarettes packaged in this way. To minimize respondent burden, six hundred respondents completed this question for: the du Maurier current package; the du Maurier plain package; and the du Maurier lungs package. The remaining six hundred respondents completed this question for: the Matinee current package; the Matinee plain package; and the Matinee lungs package. These two plain package designs were chosen for use in the National Survey of Teens after pretesting a number of designs.

**Sample**

N=1200 youth 14-17 years old
Males=601 Females=599
n=600 per condition

**Location**

Canada

**Analysis**

MANOVA tests show that there was no order effect for conditions. MANOVA tests were used to differences between packages.

**Results**

Teens viewed other teens who smoke either du Maurier or Matinee current packages the most positively. Smokers of du Maurier or Matinee packages with white lungs on them were rated the least positively. Smokers of plain packages were rated as less positive than the current packs but more positive than smokers of the “lung” packs.

**Purpose**
To examine the impact of plain packaging on youth, including the impact on recall of health warning information.

**Methods**

**Study design**
Qualitative and quantitative data.

Qualitative study: A total of 52 focus groups were conducted with 40 in Ontario, Canada and 12 in Chicago, USA. Group interviews examined brand imagery, attributes of smokers of plain-packed and regularly-packaged cigarettes, recall of health warning on plain vs. regular packs, as well as the perceived impact of plain packaging on youth smoking behaviour.

Quantitative study: A total of 2,132 students participated in 71 classroom surveys conducted in Ontario (n=1,559) and 10 classroom surveys in Chicago (n=573). The survey measured attitudes toward regular and plain packs, expectations about the impact of plain packaging on smoking, attitudes and behaviour, as well as the believability and seriousness of health warnings on cigarette packs.

**Sample**
Focus group: N=339, aged 12-17
Survey: N=2132, aged 12-14

**Location**
Canada & United States

**Analysis**
Statistics analyses appear to have been conducted but are not described in the report.

**Results**
More students believed it was easier to see the health warning on plain packagings versus branded. 64% of Ontario and 68% of Chicago students liked a regular package better compared to a plain package, while only 8% at each site preferred the plain package. 86% of Ontario students said the plain package was more boring; 78% said it was uglier; 64% said “cool kids” would smoke the regular pack; 5% said “cool kids” would smoke the plain pack. When offered a pack to take home, 80% of Chicago students preferred to take home the regular pack, 17% chose the novel pack, and only 3% chose the plain pack. Students understood that the product was the same in both styles of packaging, but were nevertheless susceptible to the more positive imagery projected by the regular packaging. 25% said plain packaging would make young smokers smoke less and 71% said it would be make no difference. 35% of young non-smokers would be less likely to start and 62% said it would make no difference.

**Purpose**
To evaluate the effects of plain packaging on calling attention to health warnings.

**Methods**

**Study design**
Mall-intercept study with youth who indicated they smoked or were open to trying cigarettes in the next year. Subjects were assigned to 1 of 3 health warnings ("Smoking can kill you", "Cigarettes are addictive", or "Tobacco smoke causes fatal lung disease in nonsmokers") and either viewed the warning on a branded or plain white package. The packs were shown as images on a computer surrounded by other consumer products, and asked to recall the warning.

**Sample**
N=401 youth, aged 14-17

**Location**
Canada (Vancouver, British Columbia)

**Analysis**
Chi-square statistics.

**Results**
Recall levels for 2 of the 3 warnings ("Smoking can kill you", and "Cigarettes are addictive") were higher when subjects were exposed to the plain package. However, recall of the other warning was adversely affected by the plain package (higher recall for the regular package).

**Purpose**
To describe cigarette pack colouring in the New Zealand market and to determine whether pack colour is related to potentially misleading cigarettes brand variant names (e.g., regular, light, extra light and menthol brands)

**Methods**
Survey. Packs of popular cigarette brands and brand variants, covering the spectrum of light/mild/regular and menthol that were sold in a common supermarket chain, were obtained (n=29 packs). Ten respondents provided colour descriptions of pieces from the packs. They were blinded as to the origin of the colour segments and the study purpose.

**Sample**
N=10 respondents

**Location**
New Zealand

**Analysis**
The analysis involved comparing the proportions of variant types (“light”, “extra light”, “regular” and “menthol”) for packs with individual colours or groups of colours and the packs with other colours. Relative risks (RR) and 95% confidence intervals (95%CI) were calculated using EpiInfo. Relative risks could not always be calculated due to the small sample size. In these cases, tests of significance were performed using Fishers Exact test (2-tailed).

**Results**
Participants associated the colours of packs with particular attributes. For example, green packs were 25 times more likely to be menthol, blue packs almost 4 times as likely to be an “extra light” variant, and red/orange packs almost 5 times as likely to be a “regular” variant. No difference in mean colour intensity was found (i.e. lighter colours related to “lighter” cigarettes, but may be due to participants’ ability to describe colour intensity. White and silver seemed especially confusing to participants, but there was still no significant difference when white and silver were removed from results.
Purpose
Test the potential impact on adult smokers’ perceptions of three new increased size options for health warning messages (HWMs) on cigarette packages, using the current (50% of the surface is occupied by a warning) as the benchmark.

Methods
Study design
Experimental, within-subject design with four sizes of HWMs: 50%, 75%, 90%, 100%. All respondents were exposed to all four size scenarios, in rotated order. The same two picture-based HWMs were used to illustrate each size scenario, placed on a 3-dimensional king size cigarette pack with the part of the principal (front) panel reserved for the cigarette brand marked ‘Cigarettes’.

Sample
N=730 Adult smokers 18+
("Hard core" smokers n=358, “Potential Quitters” n=372)
Males n=365 Females n=365

Location
Canada

Analysis
Univariate T-tests were used for testing individual effects (i.e. deviations of each individual indicator, from the current scenario and the smaller alternative option). Multivariate MANOVA F-Tests were used to test generalized effects (i.e., effects on the whole set of indicators) based on deviations from the current scenario and the smaller alternative option, even if some of the individual indicators may not have reached significance in univariate testing.
Strict standards to decide whether to call an effect/deviation “statistically significant”. In order to earn this label, all tests must have had a probability of a type I error of less than 0.01, with a 95% confidence interval.

Results
Findings suggest that smokers believe current cigarette packages give more importance to the brand than to the warning about the health risks of smoking. Reactions to new increased warning size options showed that adult smokers are sensitive to HWMs and their size. Results of this experiment showed that any of the three increased size options for warnings on cigarettes packages would make HWMs a more effective vehicle for communicating with adult smokers than the current size: larger and more visible warnings are more likely to effectively support efforts against smoking. Two measures, smoker image (personality traits) and product image (cigarette attributes), required 90% HWMs to show statistically significant changes.

**Purpose**
Test the potential impact on youth smokers’ perceptions of three new increased size options for health warning messages on cigarette packages, using the current (50% of the surface is occupied by a warning) as the benchmark.

**Methods**

**Study design**
Within-subject experimental design with four sizes of health warning messages (HWMs): 50%, 75%, 90%, 100%. All respondents were exposed to all four size scenarios, in rotated order. The same two picture-based HWMs were used to illustrate each size scenario, placed on a 3-dimensional king size cigarette pack with the part of the principal (front) panel reserved for the cigarette brand marked ‘Cigarettes’. Outcome measures included perceived communication impact, personal persuasiveness, persuasiveness associated with six social styles of smokers, smoker image, product image, emotional impact, and packaging attractiveness.

**Sample**
N=746  Youth 12-18  (Smokers n=306, Non-smokers n=440)

**Location**
Canada

**Analysis**
Univariate T-tests were used for testing individual effects (i.e. deviations of each individual indicator, from the current scenario and the smaller alternative option). Multivariate MANOVA F-Tests were used to test generalized effects (i.e., effects on the whole set of indicators) based on deviations from the current scenario and the smaller alternative option, even if some of the individual indicators may not have reached significance in univariate testing.

Strict standards to decide whether to call an effect/deviation “statistically significant”. In order to earn this label, all tests must have had a probability of a type I error of less than 0.01, with a 95% confidence interval.

**Results**
Results of this experiment showed that any of the three increased size options for warnings on cigarettes packages would make HWMs a more effective vehicle for communicating with teenage smokers and non-smokers than the current size: larger and more visible warnings are more likely to effectively support efforts against smoking. To achieve significant and substantial generalized effects on most indicators, HWMs had to cover at least 90% of the front panel (option C). While impact on most indicators started to be statistically significant at the smallest increased option B (75%), incremental effects of option C (90%) over B (75%) and option D (100%) over C (90%) were generally proportionally larger than those of option B (75%) over A (50%). In other words, each percent of surface increase with option C (90%) and D (100%) generally delivered more impact than each percent increase from current scenario A (50%) to option B (75%). Two measures, smoker image (personality traits) and product image (cigarette attributes), required 100% HWMs to show statistically significant changes.
Purpose

To examine the impact of the size and format of the health warning messages (HWMs) on cigarette packages, including the reduction of “branded” information on the principal display area of the package and the impact of “plain” packaging.

Methods

Study design

An experimental design was used to examine four size options of HWM (50%, 75%, 90%, and 100%) and two packaging formats: branded packs (brand visible) and plain packs (brand named but with no brand markings such as colours, fonts, logos, etc). A total of 24 different mock-up packs – 16 brand packs (2 HWMs x 4 sizes x 2 brands) and eight plain packs (2 HWMs x 2 sizes x 2 brands) were tested: each respondent viewed six displays, making use of a rotation formula among four subsamples of 250 each. Outcome measures included: recall of brand information, effect/impact of increasing HWM, and the effect/impact of modifying product brand information.

Sample

N=1000  Youth 12-18  (Smokers n=100, Non-smokers n=900)

Location

Canada

Analysis

Point estimates (such as percentages) are presented in the main report; however, statistical analyses are available upon request.

Results

Three-quarters of youth recalled brand name with 50% and 75% HWMs on branded packages; 8/10 for plain packs. Youth reported that plain packs were more effective than the branded pack in informing about the health effects of tobacco (50% plain pack vs. 25% branded pack in the 50% HWM condition; and 52% plain pack vs. 26% branded pack in the 75% HWM condition). Youth reported that the plain pack is more effective than the branded pack in encouraging Canadians to reduce their tobacco use (53% plain pack vs. 23% branded pack in the 50% HWM condition; and 54% plain pack vs. 22% say branded pack in the 75% HWM condition). Youth in general and youth smokers also choose the plain pack format over the branded format as being more effective in informing and in encouraging changes in smoking behaviour.

**Purpose**
To examine the impact of plain pack designs on positive attributes about smoking among smokers.

**Methods**

**Study design**
Experimental, between-subjects. This study employed a three (brand types) by four (degree of plain packaging) design, using an online method to expose adult smokers to one randomly selected cigarette pack, after which respondents completed ratings of the pack.

**Sample**

N=813    Adult 18-49 (n=813)
    Smokers n=813
    Males n=309    Females n=504

**Location**
Australia

**Analysis**
Analysis of variance and chi-square tests were used to check that random assignment yielded equivalent groups with respect to smoking history and demographic characteristics. Preliminary analyses indicated that survey responses on the 11-point response scale were not normally distributed. Responses were skewed at two points on the scale: at 0 (indicating disagreement) and at 5 (indicating moderate agreement). The researchers therefore dichotomised responses to permit statistical analysis, with responses from 0 to 4 categorised together to reflect ‘disagreement to low agreement’ and responses from 5 to 10 reflecting ‘moderate to high agreement’. Differences between pack conditions were assessed using logistic regression analysis to generate odds ratios and confidence intervals.

**Results**
Packs that displayed progressively fewer branding design elements were perceived increasingly unfavourably in terms of smokers’ appraisals of packs, the smokers who might smoke such packs, and the inferred experience of smoking a cigarette from these packs. Smokers of plain packs were rated as less trendy/stylish, less sociable/outgoing, and less mature than smokers of the original pack. Smokers inferred that cigarettes from plain packs would be less rich in tobacco, less satisfying and of lower quality tobacco.

Purpose
To examine perceptions of leading cigarette brands in the UK among youth and adult smokers. In particular, the study sought to examine the extent to which participants perceived differences based on viewing pictures of cigarette packs with respect to the taste, tar level, health risk, attractiveness and ease of quitting (for adults) or brand of choice if they were to try smoking (for youth). The study also examined the effect of plain packaging, in which colour and brand imagery were removed.

Methods
Study design
Experimental. Respondents were recruited from a proprietary consumer panel managed by the UK survey firm. An online survey was conducted in which participants were asked to compare pairs of cigarette packs on five measures: taste, tar delivery, health risk, attractiveness and either ease of quitting (adult smokers) or brand they would choose if trying smoking (youth). Cigarette packs used in this study featured leading UK brands. Brands were purposefully selected to examine common brand descriptors and colour variations. Two of the brand pairs (‘L&B Gold’ vs. ‘L&B King Size’ and ‘Mayfair Smooth’ vs. ‘Mayfair King Size’) were modified to examine the impact of plain packaging. Plain versions of these packs were created by substituting all brand imagery and colour for a plain ‘white’ background or a plain ‘brown’ background. The name of each brand was printed in Arial 14-point font. All packs displayed pictorial health warnings covering 30% of the pack.

Sample
N=1322 516 adult smokers 18+ 806 youth aged 11-17 (smokers n=221, non-smoker n=585)

Location
United Kingdom

Analysis
Primary analyses focused on two research questions: (i) the extent to which participants endorsed either of the packs as lower health risk, etc., versus selecting ‘no difference’; and (ii) the extent to which participants selected the pack that was hypothesized to be perceived as a ‘light/low tar’ brand. Chi square tests were used to test which pack was more likely to be selected within each brand pair. Regression models were used to examine predictors of pack perceptions.

Results
Packs with lighter colours (light grey vs. dark grey; grey vs. red) were rated as lower health risk and easier to quit. For example, Marlboro packs with a gold logo (vs. Marlboro with red logo) were rated as lower health risk (53%) and easier to quit (31%) by adult smokers. Plain packs reduced false beliefs about health risk and ease of quitting, and were rated as significantly less attractive and appealing to youth for trying smoking. Plain brown packs were perceived as less appealing than plain white packs and were also associated with higher perceptions of risk.

**Purpose**  
To explore perceptions of leading cigarette brands in the Canada among youth and adult smokers. In particular, the study sought to examine the extent to which participants perceived differences based on viewing pictures of cigarette packs with respect to the taste, tar level, and health risk.

**Methods**  
**Study design**  
A mall-intercept study was conducted with adult smokers and non-smokers in Ontario, Canada. Participants viewed pairs of cigarette packages that differed along a single attribute and completed ratings of perceived taste, tar delivery and health risk. The pairs of cigarette packages presented to participants were identical except for a single element, either a descriptor in the name of the brand or the design of the package. Brand descriptors varied across six pairs of packages: full flavor versus light, light versus ultra light, regular versus mild, regular versus smooth, full flavor versus silver, and the numbers ‘10’ versus ‘6’. In addition, three pairs of packages varied with the brand imagery: lighter blue shading versus darker blue shading, a dark gray versus a white symbol, and an image of a cigarette filter, accompanied by the words, ‘charcoal filter.’

**Sample**  
N=603  
Adult 18+ (n=603)  
Smokers (n=312) Non-smokers (n=291)

**Location**  
Canada

**Analysis**  
Pearson correlation coefficients were used to test bivariate correlations between individual measures and scales. Chi-square tests were used to test the significance of proportions for packaging ratings and t-tests for independent samples were used to test differences in means between smokers and non-smokers as well as smokers of light and mild cigarette brands.

**Results**  
Participants were more likely to rate packages with “light”, “mild”, “smooth”, and “silver” as smoother tasting, delivering less tar, and lower risk compared to packs with the words “regular” or “full flavour.” Packages with lighter colours were perceived as having less tar and lower health risk compared to packages with darker colours and design elements. Smokers of light and mild cigarettes (vs. Smokers of other cigarettes) were more likely to perceive brands as smoother and having lower risk, although the same pattern of results was observed among all participants. Perceptions of taste were significantly associated with perceptions of tar level and risk.

**Purpose**
To determine and evaluate the effectiveness of the graphic health warnings on tobacco product packaging on consumers. As part of this research, public opinions on “plain packaging” were collected.

**Methods**

**Study design**
Research included the following components:

- **Group Discussions:** twenty four (24) qualitative group discussions with the target audiences, to gauge consumer reaction and response to the graphic health warnings and the explanatory content
- **Telephone Survey:** a large scale nationwide quantitative telephone survey of 1304 people to establish and compare current consumer reactions to the graphic health warnings with those obtained in the telephone survey on health warnings conducted in 2000. As well, to obtain a current and definitive measure of awareness, perceived effectiveness, and attitudes to the use of graphic health warnings
- **Stakeholder Interviews:** twenty eight (28) semi-structured interviews with key informants from organisations with an interest in tobacco control.

**Sample**

- **Group Discussions:** adults (≥18 yrs)
  - 7 Mini-group discussion (n=4-5)
  - 17 Full group discussion (n=8-10)
- **Telephone survey:** (n=1304) youth and adults (≥15 yrs)
  - Male (n=686) Female (n=618)
  - Smokers (n=231)
- **Other – Stakeholders:** (n=28)

**Location**
Australia

**Analysis**
Significant tests were conducted on weighted data for all studies, in order to establish the existence of significant differences. The z test was used to establish differences at the 95% confidence level.

**Results**
Some smokers in the group discussions contended that the graphic health warnings are competing for consumer attention with manufacturer’s messages through the use of typeface, colour, and brand imagery in general. This led them to consider that the introduction of plain packaging could help consumer recall of health warnings particularly on the front of packs. Consideration of plain packaging was further seen in the response given by consumers to the attitude 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)’ with 57% of respondents agreeing with this statement. Plain packaging is seen as the next major step by many stakeholders. Plain packaging (i.e. restricting or prohibiting the use of logos, colours, brand imagery or text other than brand names printed in a standard colour and font size) was suggested by both consumers and particularly stakeholders as one way of strengthening the impact of health messages. The suggestion that the potential effect of plain packaging is in strengthening the impact of the health warnings has also emerged in other research.

Purpose
To estimate the differences in demand and cognitive impact of cigarette packages with different health warning label formats.

Methods
Study design
Between-subjects experiment. Participants viewed four packages with the same text message (“Smoking causes mouth cancer”): a) text on 50% of one side of the pack; b) text on 50% of the front and back of the pack; c) text with picture illustrating mouth cancer on 50% of the front and back of the pack; and d) same as previous format, but on a “plain” pack without brand imagery except brand font and descriptors (e.g., light, menthol). 500 adult smokers were recruited from supermarkets in four states (South Carolina, Pennsylvania, Florida and California) 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 specific questions on their reactions to each warning label on which they bid.

Sample
N=500  Adult smokers 18+

Location
United States

Analysis
T-tests were used to assess differences in mean bids and cognitive reactions for each condition. Multivariate models regressed individual-level differences in bids across conditions, while controlling for sociodemographics.

Results
Compared to the “control US pack” the pack with the regular pack with the pictorial warning reduced demand by 12%, while the plain pack with the pictorial warnings reduced demand by 17%. When compared to the 50% front and back text only health warning label, the pictorial health warning label decreases demand by 9% whereas pictorial plus plain decreases by 15%. Mean reactions of perceived risk and desire to quit showed similar statistically significant differences across packages, except for the comparison between the pictorial and the plain plus pictorial pack. Findings were similar across sociodemographic categories.

Purpose
To examine the effect of plain packaging on adolescents’ perceptions of cigarette packs, attributes to smokers, and expectations of taste, and to identify the effect of increasing size of pictorial health warnings on appraisal of plain packs.

Methods
Study design
Experimental, between-subjects design. A 5 (degree of plain packaging and graphic health warning) by 3 (brand type) design, using a web-based methodology to expose adolescents to one randomly selected cigarette pack, during which respondents completed ratings.

Sample
N=1087  Youth (aged 14-17)
   Established smokers n= 193
   Experimenters n = 238
   Susceptible non-smokers n= 163
   Non-susceptible non-smokers n = 494
   Males n=290    Females n=310

Location
Australia

Analysis
Analysis of variance and chi-square tests were performed to check that random assignment yielded equivalent groups. A principal components analysis using oblique rotation was performed to examine which components within each outcome measure category (i.e., pack characteristics; smoker characteristics; sensory perceptions) loaded together. Analysis of variance tests were conducted to explore mean differences in ratings of plain packs, as well as for differences when an 80% HWM was added. Analyses were undertaken to examine the interaction between smoking experience and pack conditions on pack ratings. Finally, chi-square analyses were run to examine respondents’ recall of the graphic health warning by pack condition. Where multiple pair-wise comparisons are conducted, Bonferroni adjustments were made.

Results
When brand elements such as colour, branded fonts, and imagery were progressively removed from cigarette packs, adolescents perceived packs to be less appealing, rated attributes of a typical smoker less positively, and had more negative expectations of cigarette taste. Pack appeal was reduced further by increasing the size of the pictorial health warning on the most plain pack from 30% to 80% of the pack face, with this effect apparent among susceptible non-smokers, experimenters and established smokers.

**Purpose**
To examine the impact of pack design, product descriptors, and health warnings on risk perception and brand appeal.

**Methods**

**Study design**
A cross-sectional mall-intercept study from June to July 2009 with data analysis from July 2009 to December 2010 where participants were shown 12 sets of packs randomly. Each set of packs varied by a particular design feature (colour, descriptor) or warning label style (text versus graphic, size, attribution, message framing). Participants viewed a series of 12 sets of cigarette packages in randomized order. Packs were rated on criteria including risk perceptions, quit motivation, and purchase interest.

**Sample**
197 adult smokers and 200 non-smokers aged ≥18 years who were currently U.S. residents and were able to read and write in English.

**Location**
United States (Buffalo, NY)

**Analysis**
Chi-square statistics were used to test for significant differences in pack selections, as well as differences in selections between smokers and non-smokers and smokers of “light/mild” versus full-flavour cigarettes. Type of cigarette smoked was determined by current brand and type of cigarette reportedly smoked by participant. ANOVA was used to analyze mean values for truthful and believability outcomes for health warning label message attribution and Sidak test was used to adjust for experiment-wise error from multiple statistical testing. Logistic regression analysis was performed to examine how different pack selections might be influenced by a person’s smoking status and type of cigarette smoked.

**Results**
A significantly greater number of participants were likely to choose the pack that had the lighter colour shading (i.e., light blue vs. dark blue) as lower tar, reduced health risk, and smoother taste. A significantly greater number of participants were likely to choose the pack with the descriptors “light,” “smooth,” “silver” and packs with lower numbers (i.e., “6” vs. “10”) as lower tar, reduced health risk, and smoother taste compared to “full flavour” brands. Plain packs were significantly less likely to be rated as attractive, less likely to appeal to youth, and were rated as lower quality than a normal branded pack. Plain packs were also significantly less likely to be rated as having a smoother taste and were selected by fewer participants as the brand they would purchase compared to a normal, fully-branded pack. Pattern of responses to pack designs were similar regardless of demographics.

**Purpose**
This study sought to examine the impact of female-oriented packaging on young women, including the impact of “plain” or “standardized” packaging.

**Methods**

**Study design**
Between-subjects experiment. Participants completed an online survey in which they were randomly assigned to view a series of 8 packs designed according to one of four conditions: “normal” fully branded female-oriented brands (n = 141); female-oriented brands with descriptors (e.g. “slims”) removed (n = 125); female-oriented brands without brand imagery or descriptors (“plain” packs; n = 122); and “normal” non-female oriented brands (n = 124). Participants rated each of the 8 cigarette packs on perceptions of appeal, taste, tar, and health risks, and completed additional survey measures on psychosocial predictors of smoking.

**Sample**
N=512 Adult 18-25 (smoker n=233, non-smoker n=279)

**Location**
Canada

**Analysis**
Univariate descriptive statistics were calculated and reported, including the mean and standard deviations where applicable. Each hypothesis was examined in two steps. In the first step, the “main effects” model was tested and included only the “condition” variable in a linear or logistic regression, depending on whether the dependent variable was binary (logistic) or continuous (linear). In this step, the condition variable was entered as a categorical variable to examine comparisons between each of the 4 experimental conditions. In Step 2 of the model, sociodemographic variables were entered as predictors in the model.

**Results**
Women rated the “normal” fully branded female-oriented packs as significantly more appealing than the packs with the descriptors and colours removed, as well as the non-female oriented packages. Highest rated (appealing) female packs were predominantly white in colour and featured small abstract pink or blue designs. Brands labelled as “slims” were also associated with significantly higher rates of appeal. Fully branded packs were significantly more likely to be associated with positive attributes such as glamour, being slim, and sophistication. Women who viewed the normal fully branded female packs were more likely to believe that smoking helps people control their appetites compared to women who viewed the non-female oriented packs or the female oriented packs without descriptors or colours.

Purpose
To see whether it is possible to reduce the attractiveness of the tobacco pack through plain packaging, which involves removing the pack design elements and leaving only the health warning and brand name in standardized font and size, with a representative sample of smokers and non-smokers.

Methods
Study design
Quantitative study based on face to face interviews in November 2008 using a representative sample. A current cigarette pack (red and white package) and a plain pack (gray standardized prototype) of the French leading brand were compared.

Sample
N=836 individuals (smokers and non smokers) aged 18 and above

Location
France

Analysis
Responses were compared using the Chi-squared test and were also analyzed according to smoking status, gender, and age. Logistic regression analysis was used because of the qualitative nature of the dependent variables.

Results
Results indicated that plain packaging reduces the appeal of the pack (dull appearance, reduces the desire to buy). Compared to a current pack, the plain pack was associated with greater awareness of smoking danger and reported to facilitate intentions to reduce consumption, to quit, or not to start among non-smokers.

**Purpose**
To investigate the impact of the plain tobacco packaging with different base colours versus current packaging to look at attractiveness of the package.

**Methods**

**Study design**
Qualitative study based on 6 focus groups. Four different Marlboro packages were examined: one current pack vs. one plain gray pack with pictorial warnings on both sides, one current pack vs. one plain gray pack without pictorial warnings on the front, and three plain Marlboro packs of different colours (white, gray and brown) with a pictorial warning on the back.

**Sample**
50 French individuals aged between 15 and 45 years with 26 smokers out of 50 subjects and an equal number of male and female subjects.

**Location**
France

**Analysis**
Thematic content analysis was performed.

**Results**
The two plain gray packs are rated more effective prevention-wise than the two current Marlboro packs because they are less attractive and evoke negative associations and was identified as the pack that would put participants off smoking or would motivate smokers to quit. With current Marlboro packs, respondents tend to refer to the marketing image generated by the brand.

**Purpose**
This study examined the impact of cigarette pack design among young women in the United States.

**Methods**
**Study design**
A national sample of female participants completed an online survey in February 2010. Participants were randomized to view eight cigarette packs designed according to one of four experimental conditions: fully branded female packs, same packs without descriptors (e.g., “slims”), same packs without brand imagery or descriptors (“plain” packs), and branded non-female brands. Participants rated packs on measures of appeal and health risk and completed a behavioural pack selection task.

**Sample**
N=825 female youth (aged 18-19); smokers and non-smokers

**Location**
United States

**Analysis**
Regression models were used to examine the effect of experimental condition for three primary outcomes: pack ratings, smoker image ratings, and beliefs about smoking. For each outcome, regression models were conducted in two steps; in step 1, the model included only the “condition” variable, and in step 2 the following variables were entered as covariates: age, education, income, ethnicity, smoking status, and weight concerns.

**Results**
Fully branded female packs were rated significantly more appealing than the same packs without descriptors, “plain” packs, and non-female-branded packs. Female-branded packs were associated with a greater number of positive attributes including glamour, slimness, and attractiveness and were more likely to be perceived as less harmful. Approximately 40% of smokers and non-smokers requested a pack at the end of the study; female-branded packs were 3 times more likely to be selected than plain packs.

**Purpose**
To measure young adult smokers’ choice behaviours and projected responses to plain packaging (reduced branding) and larger graphic health warnings.

**Methods**

**Study design**
A 3 (warning size) x 4 (branding level) plus control (completely plain pack) best-worst experiment was conducted via face-to-face interviews. Participants were exposed to a balanced series of combined brand-warning images.

**Sample**
N=292 young adult smokers age 18-30

**Location**
New Zealand (provincial city)

**Analysis**
Best and worst data were analyzed with multinomial logit regression. The Juster Scale was used to estimate cessation linked behaviours among participants.

**Results**
Of the 13 options tested, respondents were significantly less likely to choose those featuring fewer branding elements or larger health warnings. Options that featured more branding elements were still preferred even when they also featured a 50% health warning, but were significantly less likely to be chosen when they featured a 75% warning. Comparison of a control pack representing the status quo (branded with 30% front of pack warning) and a plain pack (with a 75% warning) revealed the latter would be significantly more likely to elicit cessation-related behaviours.

**Purpose**
To explore perceptions of packaging innovation (including cigarette packs with novel shapes and method of opening), and also plain packaging (all branding removed) among young adult smokers. Smokers’ perceptions of pack and plain pack colour were also examined.

**Methods**

**Study design**
Eight focus groups were used where participants could feel and handle cigarette packs in order to gain insight into smokers’ perceptions of packaging. Participants were recruited using purposive sampling in January 2010 in one lower income and one higher income area of Glasgow by trained market researchers. Each group had six or seven participants and was segmented by gender, age (18-24, 25-35), social grade (ABC1, C2DE) and heaviness of smoking (light/moderate and heavy smokers).

**Sample**
N=54 young adult smokers aged 18-35 years.

**Location**
Scotland (Glasgow)

**Analysis**
Focus group themes were identified which were related to perceptions of packaging and plain packaging, pack and plain pack colour, and pack shape and method of opening.

**Results**
It was found that packs with novel methods of opening (e.g. lighter or book) were considered to have a negligible impact upon brand selection, particularly among males. However, a small, narrow “perfume” type pack created enormous interest among females and was perceived very favourably, being considered a fashion accessory and one that helped minimize the health risks of smoking. Coloured plain packs (white, green, light blue, red) without a brand name, any brand descriptors or tar or nicotine levels, were identified by almost all smokers as signalling product strength. Removal of branding from packs reduced the attractiveness and promotional appeal of the pack, with dark brown “plain” packs perceived as more unappealing than light brown and dark and light grey packs by all groups.

**Purpose**
To explore the impact, if any, that using plain (non-branded) cigarette packs in real-life settings has on young adult smokers.

**Methods**

**Study design**
Experimental, in a natural setting. Smokers used brown ‘plain’ packs for 2 weeks and their regular packs for 2 weeks, in real-life settings. Over the 4-week study period, participants completed a questionnaire twice a week assessing pack perceptions and feelings, feelings about smoking, salience of health warnings and smoking related behaviours. A subsample of 18 participated in a post-study interview, which employed a semistructured topic guide to assess perceptions and experiences of using plain packs.

**Sample**
N=140 smokers participated in naturalistic study (aged 18-35)
48 participants correctly completed and returned all questionnaires

**Location**
Scotland (Glasgow)

**Analysis**
Composite scores were derived for pack perceptions, pack feelings, feelings about smoking and response to warnings. Cronbach’s α was acceptable for each. Analysis compared ratings between branded and plain packs. For each time point, paired t tests produced mean scores for the plain packs relative to mean scores for their own packs. The Wilcoxon signed rank test tested for significant differences between the ratings of plain packs versus the ratings of the participant’s own packs at each measure. Data on occurrence of avoidant behaviours are binary (yes/no), and the McNemar test was used to test for differences in response between participants’ first, second, third and fourth measure on the plain pack and the respective measure on their own pack.

**Results**
Trends in the data show that in comparison with branded packaging, plain packaging increased negative perceptions and feelings about the pack and about smoking. Plain packaging also increased avoidant behaviour (hiding the pack, covering the pack), certain smoking cessation behaviours, such as smoking less around others and forgoing cigarettes, and thinking about quitting. Almost half (n=8) of those in the post-study interview, predominantly women (n=6), reported that the use of plain packs had either increased avoidant behaviour or reduced consumption.

**Purpose**  
To assess the impact of plain packaging on visual attention towards health warning information on cigarette packs.

**Methods**  
**Study design**  
Mixed-model experimental design, comprising smoking status as a between-subjects factor, and package type (branded versus plain) as a within-subjects factor.  
**Setting:** university laboratory  
**Sample**  
Convenience sample of young adults, comprising non-smokers (n = 15), weekly smokers (n = 14) and daily smokers (n = 14).  
**Location**  
United Kingdom  

**Analysis**  
Number of saccades (eye movements) towards health warnings on cigarette packs to directly index visual attention.

**Results**  
Analysis of variance indicated more eye movements (i.e. greater visual attention) towards health warnings compared to brand information on plain packs versus branded packs. This effect was observed among non-smokers and weekly smokers, but not daily smokers.

**Purpose**

To identify a shortlist of potential plain packaging colours.

**Methods**

**Study design**

Cross-sectional; online survey. The survey used a forced choice based design, Maximum Difference Scaling or 'Best - Worst', to administer the pack testing. Respondents were shown four different pack images at a time and asked to select the pack they thought performed 'best' or 'worst' on a key dimension, such as appeal. This was repeated for a different subset of packs until data was collected to evaluate all eight packs for that dimension. This process was repeated for all key dimensions of appeal, quality of cigarettes, perceived harm to health and ease of quitting. Pack images were identical except for colour and all featured a mock brand name 'Mayfair' to remove brand influence from colour evaluations.

**Sample**

N=409 adults (aged 18-65); at least weekly smokers

**Location**

Australia

**Analysis**

The scores obtained from the survey were analysed to obtain a composite score for each dimension using Hierarchical Bayes estimation (HB). HB makes it possible to estimate stable item scores from relatively sparse choice data. It does so by borrowing information across the entire sample to stabilise the scores for individuals. In the Maximum Difference exercise, respondents evaluated multiple combinations of eight test packs. For each set of four packs, the respondent indicated the 'best' and 'worst' pack on a given dimension. Individual respondents’ responses are analysed using HB techniques to derive attribute importance or preference scores at the individual respondent level. In this case, a single score is calculated that indicated performance of a pack in terms of the key dimensions. The quantitative data for Study 2 has been post-weighted to the Australian smoking population aged 18-64 years old using ABS Census data.

**Results**

The research found that darker colours were seen to contain cigarettes which were more ‘harmful to health’ and ‘harder to quit’. Conversely, lighter colours were seen to be less ‘harmful to health’ and ‘easier to quit’. The results from the pack evaluation comparison suggested that the Dark Brown colour be taken through to the next stage of research as it best met the plain packaging selection criteria. The Dark Brown colour pack was considered the least appealing pack overall; the pack which looked like it contained the lowest quality cigarettes; the pack which looked like it contained cigarettes which were most harmful to health; and the pack which looked like it contained cigarettes which were the hardest to quit.

**Outcome**

Other (legibility based on font and colour)

**Purpose**

To identify the optimal combination of design elements (font size, font colour) for legibility and ease of identification amongst potential retailers.

**Methods**

**Study design**

Face-to-face administered surveys. To test legibility, different stimuli were used including 'eyeboards' (boards with brand names in decreasing font sizes) and mock up packs (packs featuring potential brand names in different font sizes). Tests were conducted with each respondent to identify the smallest font size they could read at a one metre distance. The stimulus tested Dark Brown and Mustard (a lighter brown) pack colour candidates.

**Sample**

N=10 40 years and older

7 worked in retail environment, 3 in “customer facing environment”

4 from culturally and linguistically diverse backgrounds

**Location**

Australia

**Analysis**

The information collected from the interviews was tallies and counts of the font sizes respondents could read. As such, quantitative analysis has been conducted on the results from the legibility testing and additional comments that arose from the discussion component have been added where relevant to the quantitative findings.

**Results**

Taking into account both legibility tests (eyeboard tests and mock up pack tests), it was determined that a font size of at least 14pt font (based on an Arial or Lucida Sans font style) should be considered for the brand name on plain packaging. Observations and spontaneous comments by respondents suggested that they were more comfortable when reading a font size larger than the smallest one they ‘could read.’ Although the results of the tests do not necessarily show a substantial difference between legibility of the different font type styles, there was a general perception among respondents that the Lucida Sans font style was slightly more readable and as such could be the font style used on the final test packs.

**Purpose**
To shortlist plain packaging colours that minimised brand impact; to identify what colour respondents actually saw when shown the pack colours online; to understand if there was any difference in noticeability of the graphic health warning when using a darker pack background.

**Methods**

**Study design**
Cross-sectional; online survey. The survey tested two plain packaging candidates, the Dark Brown colour and the Mustard colour, and used a paired forced choice based design. For each dimension, respondents were asked to select the pack they felt performed 'best' and 'worst' on the key dimensions. Mock up pack images were created for each colour featuring five different brands. This was required to identify whether the appeal of the colour tested could be generalised across known brands. However, each respondent was asked to evaluate two brands only to reduce the potential for respondent fatigue. Graphic health warning mock up packs featured the brand “Mayfair” using different graphic health warnings.

**Sample**
N=455 adults (aged 18-64); at least weekly smokers

**Location**
Australia

**Analysis**
An aggregate score was constructed to take into account the responses from each respondent’s evaluation of the two brands tested to obtain an overall preference score. The outputs from this question were four point allocations scores, one for each test pack image. The total of the four scores add to 100 points. The analysis involved creating an ‘average’ or ‘mean’ score for each pack to determine any relative differences between the noticeability of the GHW on each pack.

**Results**
Overall, the Dark Brown colour best met the criteria of the research objectives as it was the pack colour that was seen to be least appealing overall, contain cigarettes that are harder to quit, contain cigarettes that have the highest harm to health, contain lower quality cigarettes and contain cigarettes that smokers would be less likely to consider smoking. There was also no evidence to suggest that brand name had any significant impact on the perceptions of the plain packaging colour. The Dark Brown colour performed best in meeting the desired criteria, regardless of which brand was on the pack. There was also no evidence to suggest that the darker plain packaging colour was distracting from the noticeability of the graphic health warning.

The research also found that the majority of respondents perceived that they were actually viewing a ‘Dark Olive’ colour on screen with only a minority viewing, and therefore evaluating, a ‘Dark Brown’ colour. There was further support to exclude the Mustard colour from further testing in that it could be perceived as being ‘Gold’ in colour which not only carries positive perceptions of being premium (as seen in Study 1) but also a similarity to existing cigarette variants on the market, such as Benson & Hedges and Dunhill.

**Purpose**
To identify the optimal plain packaging designs in combination with the new front of pack graphic health warnings (GHW).

**Methods**

**Study design**
Quantitative and qualitative. Respondents were pre-recruited to attend group clinics where they completed a self-completion questionnaire led by a moderator and then participated in a short qualitative group discussion. Twenty clinics were conducted. Nine mock up pack prototypes were created for testing. There were packs made in Medium Olive, Dark Olive (colour perceived from Online testing) and Dark Brown (original Dark Brown). For each colour, a pack with a 30% GHW, 60% GHW and 75% GHW was developed. Each pack featured the ‘Lung Cancer’ GHW.

Quantitative: Respondents were asked to look at three pack prototypes in three colours, each featuring the same size GHW. The questions asked respondents to select ‘best’ and ‘worst’ pack on key measures of overall pack appeal, quality of cigarettes, perceived harm to health, ease of quitting, and noticeability of the GHW on pack. A rotation was applied such that a third of respondents evaluated the colours featuring a 30% GHW, another third the 60% GHW and the final third the 75% GHW. Respondents were then asked to look at three pack prototypes in the same colour each featuring a different size GHW. The questions asked respondents to rate each pack on key measures of appeal and message comprehension using an 11pt scale of 0-10. A rotation was applied such that a third of respondents evaluated the packs in Dark Olive, another third the Medium Olive pack and the final third the Dark Olive pack.

Qualitative: Following the group discussion, respondents participated in a short 10 minute group discussion that reviewed their responses to the survey in relation to overall perceptions of the different colours; overall perceptions of the GHW and their impact; how they look at packs and pack elements; and overall appeal of packs.

**Sample**

N=193 youth & adults (aged 16-64); at least weekly smokers
Australia (Sydney & Melbourne)

**Analysis**
(No analysis information on colour tests was provided)
To understand the degree of impact for each of the GHW sizes, a mean score (or average score) was calculated for each of the different GHW size packs. This provided an overall figure to compare how each of the GHW sizes performed on the selection criteria.

**Results**
The qualitative research found that all three colours tested were seen to be unappealing. That said, there were some positive associations in the way the Medium Olive and Dark Brown were described. The only colour which did not carry any positive associations from the qualitative research was the Dark Olive colour.

In the quantitative research, the Medium Olive did not met the selection criteria as it was seen to be more appealing, less harmful to health and contain higher quality cigarettes.
Although the Dark Brown colour best met the selection criteria when tested quantitatively, the qualitative research found that the colour carried some positive connotations of being 'classy', 'upmarket' and some describing the colour as 'chocolate' and 'rich'.

Compared to the two other colours tested, the Dark Olive was not perceived to be the most appealing nor the least appealing colour. The qualitative research found that it did not elicit any positive associations. There was no quantitative evidence to suggest that the different colours made the GHW more, or less noticeable. The Dark Olive colour was recommended as the final plain packaging colour. It was seen to be the least appealing, have the lowest quality cigarettes and highest perceived harm to health for all earlier rounds of online testing (under the label 'Dark Brown'). The Dark Olive colour also carries negative connotations of 'death', 'dirty' and ‘tar’, albeit to a lower degree than when directly compared to the Dark Brown. It was not seen as having any similarity to any current brands on the market and was perceived as a difficult colour to define and name, thus it did not elicit any positive associations and has limited potential to do so.

The results from the quantitative and qualitative research components demonstrated that increasing the size of the GHW on front of pack increased stand-out and impact whilst decreasing appeal. The 75% GHW pack performed the best in terms of the research objectives of this study. Although a 60% GHW scored more strongly than the 30% on the key measures, there were larger (statistically significant) shifts observed for the 75% GHW.

**Purpose**
To identify one graphic health warning size and layout on the front of pack that would maximise the noticeability and impact of the GHW on cigarette packaging.

**Methods**

**Study design**
Cross-sectional, online survey. The pack perceptions tested the different GHW sizes / layout options on the following dimensions: noticeability; comprehension; impact; and effectiveness. A total of eight different pack images were developed for testing using two GHWs, ‘Lung Cancer’ ("Smoking causes Lung Cancer") and ‘Baby’ ("Smoking harms unborn babies"). Respondents were shown four different front of pack designs in a Dark Olive featuring a 30% GHW, a 60% GHW, a 75% GHW and a split 60% GHW. Respondents’ pack images featured either the 'Lung Cancer' GHW or the 'Baby' GHW.

Respondents were first asked to provide a rating from 0 - 10 on each of the above measures for each pack. Four packs featuring the four different front of pack GHW sizes / layouts were shown on the screen, side by side. Following these evaluations, the same four packs were shown on the screen side by side and respondents were asked to select the pack they felt performed 'most' and which pack performed 'least' on each of the dimensions. Two different GHW were used in the research, however, the survey was designed so that respondents only evaluated one of the GHWs. Respondents were randomly allocated to one of the GHWs and quotas were set for age and gender to ensure the samples evaluating either GHW were matched.

**Sample**
N=409 adults (aged 18-64); at least weekly smokers

**Location**
Australia

**Analysis**
Significance testing was conducted to identify differences in the noticeability of GHW elements, as well as differences in the comprehension, impact and effectiveness of GHW elements by pack design (different GHW sizes and layout options), but was not described in detail.

**Results**
The pack with the 75% GHW on the front of pack outperformed all other packs on all measures tested. It was seen to be the pack which had the highest share of GHW component noticeability on pack, the GHW stood out the most, the GHW message was easiest to understand, the strongest impact to make ‘you stop and think’, and conveyed the health risks to be most serious. The second best performing pack on the above measures was the 60% GHW which performed significantly better than the 30% GHW pack on most selection criteria. The 30% pack performed the worst on the selection criteria along with the 60% split GHW pack. Although the 60% split GHW was more noticeable than the 30% GHW, there were no observable differences in measures of message comprehension or engagement.

**Purpose**
To identify the optimal plain packaging designs in combination with the new front of pack graphic health warnings.

**Methods**

**Study design**
Cross-sectional, online survey. The pack perceptions tested the different GHW sizes / layout options on the following dimensions: noticeability; comprehension; impact; and effectiveness. A total of four different pack images were developed for testing using the 'Baby' ("Smoking harms unborn babies") GHW. Respondents were shown four different pack designs in a Dark Olive featuring a 30% GHW, a 60% GHW, a 75% GHW and a split 75% GHW.

Respondents were first asked to provide a rating from 0 - 10 on each of the above measures for each pack. Four packs featuring the four different front of pack GHW sizes / layouts were shown on the screen, side by side. Following these evaluations, the same four packs were shown on the screen side by side and respondents were asked to select the pack they felt performed 'most' and which pack performed 'least' on each of the dimensions. Two different GHW were used in the research, however, the survey was designed so that respondents only evaluated one of the GHWs. Respondents were randomly allocated to one of the GHWs and quotas were set for age and gender to ensure the samples evaluating either GHW were matched.

**Sample**
N=205 adults (aged 18-64); at least weekly smokers

**Location**
Australia

**Analysis**
To provide a more comprehensive evaluation of the different front of pack GHW designs, analysis was conducted on data collected for Study 6 Online and data for the 60% split GHW design by those who evaluated the 'Baby' GHW from Study 5 Online.

**Results**
The pack with the 75% (non-split) GHW outperformed the other GHW design layouts on all measures tested and resulted in stronger message cut through and impact than the split 75% design. The split 75% GHW performed similarly to the 60% GHW.

Taking into account the results from both the Study 6 Online and the Study 5 Online research, the research provided strong evidence that a larger front of pack GHW results in higher GHW noticeability, message cut through and impact. A non-split GHW results in higher GHW noticeability, message cut through and impact for a given GHW coverage. A split GHW also results in lower GHW image standout.

**Purpose**
To empirically test how much longer each transaction is likely to be and how many more errors are likely to be made with the introduction of plain packaging for tobacco products.

**Methods**

**Study design**
Experimental. Participants were randomly assigned to stand in front of a display of either 50 plain or coloured cigarette packets and then were read a randomly ordered list of cigarette brands. The time participants took to locate each packet was recorded and all selection errors were noted. After 50 ‘transactions’, participants repeated the entire experiment with the alternative plain/coloured packs. The study captured 5,200 cigarette pack “transactions.” Afterwards, participants were asked in an open-ended manner whether plain or coloured packaging was easier to locate and why.

**Sample**
Other

N=52 (26 men and 26 women)

**Location**
Australia

**Analysis**
Paired samples t tests compared participants’ first 25 or 50 transactions, regardless of packaging type, with the average time for the first 25 or 50 transactions. Wilcoxon signed ranks test assessed differences in selection errors made for coloured packs compared with plain packs. Chi-square test was used to test for differences in which type was easier to select. Participants’ open-ended discussions about which type of packaging was easier to use were clustered into recurring themes.

**Results**
The average transaction was significantly quicker for plain compared with coloured packs. One or more mistakes were made by 40.4% of participants when selecting coloured packaging compared with only 17.3% for plain packaging. Qualitative results suggested that the colours and inconsistent location of brand names often served to distract when participants scanned for brands.

**Purpose**
The current study sought to examine perceptions of cigarette packaging among adults in France.

**Methods**

**Study design**
Experimental. A representative random sample of adult smokers and non-smokers were surveyed using computer-assisted personal interviewing to assess perceptions of pack design by comparing ‘regular’ branded packs and ‘limited edition’ packs (with novel designs or innovations) with ‘plain’ versions of these packs with all branding, including colour, removed. For each brand, respondents were asked which pack type was (1) most effective in getting attention, (2) most attractive, (3) most effective in convincing non-smokers not to start, (4) most effective in motivating smokers to quit, (5) most effective in motivating smokers to reduce consumption and (6) most effective for motivating youth to purchase the pack. The survey was conducted by a market research company.

**Sample**
N=836 adults (18 years and older)
33.2% smokers, 66.8% non-smokers

**Location**
France

**Analysis**
Chi-square tests examined differences in the proportion of respondents selecting each pack. Logistic regression models examined differences in perceptions of the limited edition packs compared to regular and plain packs. Logistic regressions assessed whether plain packs were perceived by smokers as more likely to reduce consumption or motivate quitting. Logistic regression tested whether plain packs were perceived by non-smokers as a means for preventing non-smokers from starting.

**Results**
Plain packs (PP) were less likely than regular packs, and particularly limited edition packs, to be considered attractive, attention grabbing and likely to motivate youth purchase. PPs were also rated as the most effective in convincing non-smokers not to start and smokers to reduce consumption and quit. Logistic regression showed that smokers motivated to quit, in comparison to smokers not motivated to quit, were significantly more likely to consider the PPs as the packs most likely to motivate cessation.

Purpose
To draw on brand attribute and symbolic consumption theory to explore how young adult smokers and non-smokers interpret tobacco packages and whether packaging functions as advertising.

Methods
Study design Cross-sectional. In an on-line survey format, participants recruited through a market research panel evaluated eight tobacco brands using ten attributes based on brand personality scales. Respondents were presented with images of seven cigarette brands and one largely generic brand. Respondents selected from 15 adjectives to associate with each of the brands. Presentation order of the brands and attributes was randomized.

Sample
N=1035 young adults (aged 18-30)
485 smokers
550 non-smokers

Location
New Zealand

Analysis
Principal Components Analysis was initially used to examine each brand’s underlying attributes and then ANOVA to test differences between gender, ethnicity and smoking status. Gender and ethnicity differences were not systematic. The only consistent differences occurred between non-smokers’ and smokers’ responses; the results section thus focuses on these groups, while noting differences by other variables where relevant.

Results
Young adults distinguished between brands on the basis of their packaging alone, associated each brand with specific attributes, and were equally able to interpret familiar and unfamiliar brands. Contrary to our expectations, non-smokers made more favourable brand-attribute associations than smokers, but both groups described Basic, a near generic brand, as ‘plain’ or ‘budget’. There were no significant gender or ethnicity differences.
To use brand association and symbolic consumption theory to explore how plain cigarette packaging would influence the identities young adults cocreate with tobacco products.

**Methods**

**Study design**

Qualitative. Group discussions and in-depth interviews with 86 young adult smokers and nonsmokers investigated how participants perceive tobacco branding and plain cigarette packaging with larger health warnings. Individuals were allocated to groups according to their gender, ethnicity, and smoking status (current nonsmoker or current daily smoker). Participants reviewed two-dimensional images of cigarette packages that featured full and limited brand insignia. Discussions explored how removing tobacco branding and replacing this with larger warnings would affect the symbolic status of tobacco brands and their social connotations.

**Sample**

N=86 young adults (aged 18-25), 49 women and 37 men
42 smokers
44 nonsmokers

**Location**

New Zealand (Wellington, Dunedin and Whanganui)

**Analysis**

Discussions were recorded and transcribed. Two coders independently conducted close readings of the transcripts, identifying idea elements, plotting and testing relationships between these, and grouping similar idea elements into tentative themes. The preliminary themes were reviewed and tested against other coded and uncoded items to minimize overlap and strengthen within-theme coherence. All moderators participated in this iterative process and agreed on the final themes that emerged.

**Results**

Smokers used tobacco brand imagery to define their social attributes and standing, and their connection with specific groups. Plain cigarette packaging usurped this process by undermining aspirational connotations and exposing tobacco products as toxic.

Purpose
This study explored how teens interpret and respond to graphic warning labels and the plain packaging of cigarettes, to assess the potential these strategies may offer in deterring smoking initiation.

Methods
Study design
Qualitative. Twelve semi-structured focus group interviews were undertaken with a stratified sample of students from a diverse range of schools between June and August 2009. Following formative discussions regarding general attitudes towards smoking and smokers stereotypes two branded cigarette packets were shown to the participants. Students were then shown a plain cigarette pack prototype that included just the graphic warning label.

Sample
N=80 youth (aged 14-16); smokers and non-smokers

Location
New Zealand (Auckland)

Analysis
A thematic analysis using an inductive and iterative approach was conducted. Interview data was imported into NVivo and coding categories were developed progressing from open (descriptive) coding to an analytical coding framework (original codes revised, merged and refined). Analysis involved refining and recoding the text until a series of interlinking themes were elicited. The final coding framework that was the basis for the final interpretive analysis was developed by all members of the research team.

Results
Graphic warning labels may influence adolescents by reiterating a negative image of smokers. Graphic warning on a plain cigarette pack increased the attention paid to graphic warning labels and the overall perceptions of harm caused by cigarette smoking, and reduced the social appeal of cigarette smoking.

**Purpose**
To examine the role, if any, that packaging plays in why young people choose cigarettes, perceptions of pack color in relation to strength and harm, and perceptions of different plain packs and the possible need for pack standardization.

**Methods**

**Study design**
An online survey, called the “Youth Tobacco Packaging Survey 2010” was administered to young people to explore why youth choose cigarettes, perceptions of pack color, and perceptions of plain (nonbranded) cigarette packaging. Young people were also shown an image of 3 plain packs, which differed by shape and method of opening, and asked which they liked most and thought others their age would smoke.

**Sample**
N=658 youth (aged 10-17); 53% female
- never-smokers (n=496)
- ever-smokers (n=162)

**Location**
UK

**Analysis**
Descriptive data were examined and items, originally measured on a 5-point scale, were dichotomized to show the proportion of young people responding to each item. Data have been analyzed using the chi-square test to identify differences in responses by ever-smokers compared with never-smokers and nonsusceptible never-smokers compared with susceptible never-smokers.

**Results**
Price and what significant others smoke were key factors for choosing cigarettes, with packaging also an important influence. More than a third of the sample associated lighter pack color with weak tasting and less harmful cigarettes. Plain packs were rated negatively as were perceptions of plain pack users. One in 3 showed a preference for either a narrow “perfume type” plain pack or a plain “slide” pack that opened from the side, and 1 in 3 also thought that young people would smoke these packs.

**Purpose**
To determine if there is a potential impact of the appearance of a plain cigarette package on the smoking perceptions and behavioural intentions of Flemish adolescents.

**Methods**

**Study design**
Cross-sectional using qualitative focus group discussion. The researchers performed eight focus group discussions with Flemish youth participants recruited by a market research company. Participants were grouped by age and education. Participants were youth who attended regular high school education or vocational training and were current or ever smokers. Participants were shown popular brand cigarette packages, followed later by a plain package and the comparable brand package. The outcome measure was the opinions and perceptions of young Flemish smokers regarding the impact of cigarette packaging on their smoking behaviour.

**Sample**
N=55 aged 15-18; 32 female, 23 male
Current or ever smokers

**Location**
Belgian (Flanders)

**Analysis**
Audio recordings of the focus groups were transcribed and the transcriptions were analysed. The qualitative data were analysed following the open coding method. This process was performed multiple times, comparing different focus groups discussions and the responses of different participants, until central themes emerged. To guarantee validation of the analysis, the process was undertaken by a second independent analyst. The results of this coding procedure were then compared with the debriefing notes.

**Results**
The motives which were repeatedly mentioned when choosing a certain brand were the price of the brand, the taste of the cigarettes, the influence of the social environment, the recognition of a certain brand and the influence of the packaging (appearance, size and manageability). Plain packages are perceived as less attractive, cheap and unreliable for young people. Because of the unattractiveness of the plain packaging, the health warnings catch the eye much more strongly.

Purpose
To assess the effects on brand appeal of plain packaging and size of pictorial health warnings (PHWs).

Methods
Study design
Experimental, between subjects. Respondents were allocated randomly to view one of size pack conditions that varied by size (30%, 70% and 100% size front-of-pack PHWs) and presence/absence of branding. Participants were sourced from a national online panel. Participants viewed and rated size cigarette brands within their pack condition. Measurements were rating of cigarette brands, smoking attitudes and intentions, purchase intent.

Sample
N=1,203 adult smokers

Location
Australia

Analysis
Analysis of variance (ANOVA) and $\chi^2$ tests checked that random assignment yielded equivalent groups. There were no systematic interactions between brands by plainness or size of PHW across the five rating outcome measures. Responses to each of the six brands were therefore aggregated for each participant for statistical analysis. Two-way ANOVAs examined the main effects of pack plainness and size of PHW, and interactions between plainness and size of PHW. Main effects of age group (18–29 years versus 30 + years) on pack ratings were also assessed using ANOVAs, including interactions. Main and interaction effects of plainness of pack and PHW size on purchase intent, attitudes toward smoking and smoking intentions were investigated by logistic regression analysis. Where multiple pairwise comparisons were conducted, Bonferroni adjustments were made.

Results
Compared to branded packs, plain packs reduced smokers' ratings of 'positive pack characteristics', 'positive smoker characteristics' and 'positive taste characteristics'. Plain packs were rated as being smoked by people who were more 'boring' than those who smoked branded packs. By contrast, increasing size of PHW above 30% only reduced ratings of 'positive pack characteristics', but also decreased ratings of smokers as being 'boring'. Plainness and size of PHW interacted in predicting ratings of 'positive pack characteristics', so that when packs were plain, increasing the size of PHW above 30% did not further reduce ratings. Presentation of only plain packs increased the likelihood that smokers would not choose to purchase any pack (20.3%) compared to presentation of only branded packs (15.3%) (odds ratio=1.4; $P=0.026$), while size of PHWs had no influence upon purchase choice.
Purpose
The current study examined how tobacco packaging influences brand appeal and perceptions of health risk among young women in Brazil.

Methods
Study design
Experimental, between-subjects. Participants were recruited through a commercial market research company to complete an online survey. Respondents were randomized to view 10 cigarette packages according to one of three experimental conditions: standard branded packages, the same packs without brand imagery (“plain packaging”), or the same packs without brand imagery or descriptors (e.g., flavors). Participants rated packages on perceived appeal, taste, health risk, smoothness, and smoker attributes. Finally, participants were shown a range of branded and plain packs from which they could select one as a free gift, which constituted a behavioral measure of appeal.

Sample
N=640 young adult women (aged 16–26)

Location
Brazil

Analysis
Chi square tests assessed differences in key socio-demographic factors between experimental conditions. Logistic regression models examined the effect of the experimental conditions for single packages on the four brand attributes, and the extent to which participants selected a pack (branded or plain) in the pack selection task. Linear regression models examined the effect of the experimental conditions on each of the four brand attribute and six smoker image index variables, including the overall “positive smoker image index”.

Results
Branded packs were rated as significantly more appealing, better tasting, and smoother on the throat than plain packs. Branded packs were also associated with a greater number of positive smoker attributes including style and sophistication, and were perceived as more likely to be smoked by females than the plain packs. Removing descriptors from the plain packs further decreased the ratings of appeal, taste and smoothness, and also reduced associations with positive attributes. In the pack offer, participants were three times more likely to select branded packs than plain packs.

**Purpose**
To examine the extent to which increasingly plainer packaging might increase recall of health warnings.

**Methods**

**Study design**
Experimental; between-subjects. A 4 (three levels of plain packaging and an original package) x 2 (smoking status: smokers and non-smokers) between-subjects design in which participants were randomly assigned to view one package. After a brief seven-minute survey that served as a time-delay strategy, participants answered a multiple-choice question to test their recall of the health warning on their package. Participants were recruited from three universities.

**Sample**
N=220 adult university students (aged ≥19)
54.5% female; 45.5% male
77.5% aged 19-24; remainder ≥25 years

**Location**
Canada (Nova Scotia)

**Analysis**
A preliminary analysis found no significant difference in demographic variables across the four pack conditions. A sequential binary logistic regression test was used to examine whether plain packaging and/or smoking status affects health warning recall.

**Results**
The odds of recalling the correct health warnings were significantly higher for the two plainest packages relative to the original package. The odds of recalling the correct health warning was also higher for non-smokers relative to smokers.

**Purpose**
To assess change in cigarette pack transaction time in retail outlets following the introduction of plain packaging in Australia in 1 December 2012.

**Methods**

**Study design**
In October 2012 and January 2013 researchers timed tobacco transactions at convenience stores, newsagents, petrol stations, and supermarkets in 16 suburbs of Perth, Australia. Researchers requested one of 17 popular brands of cigarettes (systematically randomised) and, using concealed stopwatches, measured the time from their request to shopkeepers electronically scanning or placing the cigarettes on counter. Researchers then apologised for forgetting their wallets, left, and noted any selection errors.

**Sample**
Other

N=100 convenience stores, newsagents, petrol stations and supermarkets

**Location**
Australia (Perth)

**Analysis**
Wilcoxon ranks tests, t-tests

**Results**
More retailers decreased than increased selection times after 1 December 2012 (n=61 v 39), on average decreasing from 8.94 s to 7.39 s (t(99)=1.964; P<0.05). No significant differences were observed for deletion errors.

**Purpose**
To compare adolescents’ responses to three different styles of cigarette packaging (novelty, regular and plain) by assessing susceptibility to smoking, pack appraisal and pack receptivity.

**Methods**

**Study design**
Cross-sectional in-home survey as part of the Youth Tobacco Policy Survey with sample generated using a random location quota. Participants viewed one image showing five cigarette packs: three novelty (branded packs designed with a distinctive shape, opening style or bright colour), one regular (branded pack with no special design features) and one plain (brown pack with a standard shape and opening and all branding removed, aside from brand name). Eleven items assessed participants’ responses.

**Sample**
N=1025 youth, aged 11-16, never smokers

**Location**
UK

**Analysis**
T tests produced mean scores of 11 items for each pack type, Wilcoxon signed rank test tested for significant differences between ratings. Principal components analysis determined the suitability of constructing two composite measures for 9 of the 11 items, “pack appraisal” and “pack receptivity” which used binary variables. Analyses used generalised estimating equations (GEE) for binary outcomes with an exchangeable correlation structure. Researchers clustered robust SEs to calculate variances. For each of the five packs, two hierarchical binary logistic regression models examined association between (1) positive pack appraisal and susceptibility and (2) receptivity to the pack and susceptibility.

**Results**
Mean responses to the three pack types were negative for all survey items. However, ‘novelty’ packs were rated significantly less negatively than the ‘regular’ pack on most items, and the novelty and regular packs were rated less negatively than the ‘plain’ pack. For the novelty packs, susceptibility was associated with positive appraisal and also receptivity. For example, those receptive to the innovative Silk Cut Superslims pack were more than four times as likely to be susceptible to smoking than those not receptive to this pack (AOR=4.42, 95% CI 2.50 to 7.81, p<0.001). For the regular pack, an association was found between positive appraisal and susceptibility but not with receptivity and susceptibility. There was no association with pack appraisal or receptivity for the plain pack.

**Purpose**
To explore the role, if any, of cigarette appearance on perceptions of appeal and harm among adolescents.

**Methods**

**Study design**
Qualitative, exploratory. Eight focus groups with 15-year-olds were conducted to explore young people’s perceptions of eight cigarettes differing in length, diameter, colour and decorative design. Participants were recruited using purposive sampling. Groups were split evenly by gender and socioeconomic grouping. The groups started with a warm-up discussion on general shopping habits before moving on to consumer goods packaging, tobacco packaging and then cigarette design awareness. Eight cigarettes were shown to participants. Participants were asked to group the cigarettes together in whatever way they thought appropriate and then order the items for attractiveness, strength and harm. Photographs were taken to record the positioning of cigarettes.

**Sample**
N=48 youth (aged 15), 19% regular smokers, 81% non-smokers

**Location**
Scotland (Glasgow)

**Analysis**
Data from the transcripts, photographs and focus group observations were reviewed using thematic analysis to identify key and emergent themes. The research team met to discuss and review the themes until consensus was achieved. Transcripts were coded using NVivo9 software and the analysis followed an inductive approach to interpret the data.

**Results**
Slim and superslim cigarettes with white filter tips and decorative features were viewed most favourably and rated most attractive across gender and socio-economic groups. The slimmer diameters of these cigarettes communicated weaker tasting and less harmful looking cigarettes. This was closely linked to appeal as thinness implied a more pleasant and palatable smoke for young smokers. A long brown cigarette was viewed as particularly unattractive and communicated a stronger and more harmful product.

**Purpose**
The current study examined perceptions of cigarette packaging among female youth and the potential impact of “plain” cigarette packaging regulations.

**Methods**

**Study design**
Experimental, between-group. A national sample of female subjects in the United Kingdom recruited from a consumer panel completed an online survey. Participants were randomized to view 10 cigarette packs designed according to one of four experimental conditions: fully branded female packs, the same packs without descriptor words, the same packs without brand imagery or descriptors (“plain” packs), and branded non-female brands. Participants rated packs on measures of (1) appeal and health risk, (2) positive smoker image, and (3) completed a behavioral measure of whether respondents would accept a pack offer.

**Sample**
N=947 female youth, aged 16-19
68.9% non-smoker
21.8% daily smoker
6.1% weekly smoker
3.3% monthly smoker

**Location**
UK

**Analysis**
Linear regression models examined differences across experimental conditions for the appeal, taste, tar, health risk index variables and smoker trait index variables. To address heteroscedasticity across experimental groups, the tar and health risk indices were log transformed, and a square root transformation was applied to the smoker trait index. Because differences in smoking behavior were observed between experimental conditions, all linear regression models included: age, education, ethnicity, smoking status, and weight concerns. Unstandardized betas (β) were reported for all linear regression models. Finally, comparisons across conditions for each of the individual 10 female oriented packages were tested using logistic regression models.

**Results**
Plain packs were rated as the least appealing and worse tasting compared with all other conditions. Plain packs were also associated with fewer false beliefs about health risks compared with branded packs. Removing brand descriptors from packs significantly reduced measures of appeal and taste, particularly for brands with flavor descriptors, such as cherry and vanilla. Plain packs were significantly less likely to be associated with positive images, such as glamour, sophistication, and slimness. Most importantly, respondents were significantly less likely to accept a pack of cigarettes when offered only plain versus branded packs (p = .026).

Purpose
This study examined perceptions of branded and standardized cigarette packages among British youth.

Methods
Study design
Experimental, “within-subject”; participants recruited from a proprietary consumer panel completed an online survey. Participants viewed pairs of packages altered using a 3 x 2 factorial design: health warning type (40% text, 40% pictorial or 80% pictorial) x standardized pack colour (white vs. brown). A discrete choice task was used in which participants selected packs based on attractiveness, taste, tar, health risk, impact of health warning and enticement to start smoking. Participants also compared regular Silk Cut and ‘Superslims’ Silk Cut packs. Participants completed a final selection task from two standardized and two branded packs.

Sample
N=712 youth, aged 11-17. 3.3% smoke every day

Location
UK

Analysis
Chi-square tests were used to examine whether there was a significant difference in the proportion of participants who selected either pack within each pair for each of the six outcomes. To adjust for multiple comparisons, the Benjamin–Hochberg adjustment was applied. Generalized estimating equation (GEE) models were used to test for differences across the six pairs for each of the six outcomes. Separate GEE models were used for each outcome. All six pack pairs had the same reference group—a regular branded Benson and Hedges pack—hence the outcome of interest in each model was the proportion of individuals who selected the unbranded comparison pack. The two-way interaction between standardized pack colour and warning type was tested by running additional GEE models with the interaction term.

Results
Warning type was significantly associated with all six outcomes: packs with larger pictorial warnings were more likely to be perceived as less attractive, less smooth, greater health risk, higher tar delivery, more effective health warnings and less likely to encourage initiation. The same pattern was found for brown vs. white standardized packages, with the exception of attractiveness and initiation. Compared with the regular Silk Cut pack, the ‘Superslims’ Silk Cut pack was perceived as significantly more favourable on all six outcomes. Among respondents who selected a pack in the pack selection task, 95.1% selected a branded pack vs. 4.9% who selected a standardized pack.

Purpose
The main aim of the study was to investigate how package design affects young people’s perceptions of typical smokers of some pre-chosen cigarette brands and brand varieties.

Methods
Study design
Experimental, between-subjects; online survey. Participants recruited from TNS Gallup’s online participant panel were allocated to one of three groups, and asked to typify the smokers of selected cigarette packs either in branded, plain or plain with descriptor versions. The smoker characteristics were: gender, glamour, stylishness, popularity, coolness, sophistication and slimness.

Sample
N= 1022 youth and young adults aged 15–22, 20.5% smokers

Location
Norway

Analysis
Unadjusted ORs for giving at least one positive user characteristic were estimated based on 18 single-pack dummy variables. ANOVA with Bonferroni post hoc tested for differences between user-characteristics indexes for pack versions. Gender-specific linear regressions on the global index, with pack version as an independent variable were performed.

Results
For each make, both genders had a stronger tendency to give at least one positive user characteristic for the branded vs. the plain version of the pack. Across makes, the branded version of the packs stood out with a higher occurrence of almost all of the positive user traits and a higher global user characteristic for girls, an effect that persisted after controlling for confounders. The difference in user characterisations between branded and plain pack versions was less striking for boys, who nevertheless were more likely to think that the users of the branded packs were boys. For girls, this effect held up after controlling for confounders.

**Purpose**
To assess the effects of plain packaging on visual attention towards health warnings on branded and plain packs of cigarettes among adolescents.

**Methods**

**Study design**
Mixed-model experimental. Study design included smoking status as a between-subjects factor and pack type (branded or plain pack) and eye gaze location (health warning or branding) as within-subjects factors. Study was set in three secondary schools in Bristol, UK. Participants were a convenience sample of adolescents. Outcomes of interest were the number of eye movements to health warnings and branding on plain and branded packs.

**Sample**
N=87 youth (aged 14-19)
never-smokers (n = 26)
experimenters (n = 34)
weekly smokers (n = 13)
daily smokers (n = 14)

**Location**
UK (Bristol)

**Analysis**
Eye-position data were analysed off-line using an automatic saccade detection procedure. A 4 (smoking status: never-smoker, experimenter, weekly smoker, daily smoker) x 2 (saccade landing position: health warning, branding) x 2 (pack type: plain, branded) analysis of variance was used to analyse the number of eye movements data. Interaction effects were explored by further stratified analyses.

**Results**
Irrespective of smoking status revealed more eye movements to health warnings than branding on plain packs, but an equal number of eye movements to both regions on branded packs. This was observed among experimenters and weekly smokers, but not among never-smokers or daily smokers.

**Purpose**
To explore young adult women smokers’ cognitive and emotional response to using dark brown ‘plain’ cigarette packs in natural settings and whether plain packaging is associated with any short-term change in smoking behaviour.

**Methods**

**Study design**
Experimental, in a natural setting. Participants were recruited using random location quota sampling. Participants used plain cigarette packs provided to them for 1 week and for 1 week their own fully branded packs, but otherwise smoked and socialised as normal. Participants completed questionnaires twice a week, assessing primary and secondary outcome measures: pack perceptions and feelings, feelings about smoking, salience and perceptions of health warnings and avoidant and cessation behaviours.

**Sample**
N=187 young women aged 18-35, smokers

**Location**
Scotland

**Analysis**
Composite scores were derived for pack perceptions, pack feelings, feelings about smoking and response to warnings. Paired t tests were used to produce mean scores for the plain pack relative to branded pack. The Wilcoxon Signed Rank tested differences between pack ratings. Data on avoidant/cessation behaviours was tested with the McNemar test. These behaviours and reported daily consumption were analyzed with paired t tests, including tests on differences in reporting days. The Wilcoxon Signed Rank test was used to test for differences, across time, in the composite scores. Analyses explored whether results were consistent with age group (18–24, 25–35), social grade and dependence level (light, moderate/high).

**Results**
Plain packaging was associated with more negative perceptions and feelings about the pack and about smoking. No significant overall differences in salience, seriousness or believability of health warnings were found between the pack types, but participants reported looking more closely at the warnings on plain packs and thinking more about what the warnings were telling them. Participants reported being more likely to engage in avoidant behaviours, such as hiding or covering the pack, and cessation behaviours, such as foregoing cigarettes, smoking less around others, thinking about quitting and reduced consumption, while using the plain packs. Results did not differ by dependence level or socioeconomic status.
**Purpose**
This study examined the impact of colour variations, imagery and brand descriptors on product perceptions, the effect of removing these elements and individual differences in perceptions of packaging.

**Methods**

**Study design**
Experimental, between-subjects; online survey. Participants recruited from TNS Gallup’ s online participant panel were randomised to one of the three experimental conditions: fully branded cigarette packs, plain packs with descriptors and plain packs without descriptors; and shown 12 individual cigarette packages, including “gender-oriented” packs. Participants rated packages based on appeal, taste and harmfulness. The participants made comparisons between five pairs of packs from the same brand family and rated the outcomes of taste, harm, quality, ‘would rather try’ and ‘easier to quit.’

**Sample**
N=1010 youth and young adults aged 15-22, 20.5% smokers

**Location**
Norway

**Analysis**
Logistic regression models used to test for differences between three experimental conditions. Linear regression analysis was used to test the differences in index scores between the conditions. Linear regression analysis was also used to test differences between the conditions on pack comparison index scores.

**Results**
Plain with and without descriptors packs were rated less positively than the branded packs on appeal (index score 1.63/1.61 vs 2.42, p<0.001), taste (index score 1.21/1.12 vs 1.70, p<0.001) and as less harmful (index score 1.0.34/0.36 vs 0.82, p<0.001) among females. Among males, the difference between the plain with and without descriptors versus branded condition was significant for appeal (index score 2.08/1.92 vs 2.58, p<0.005) and between the plain without descriptors versus branded condition for taste (index score 1.18 vs 1.70, p<0.00). The pack comparison task showed that the packs with descriptors suggesting a lower content of harmful substances, together with lighter colours, were more positively rated in the branded compared with the plain condition on dimensions less harmful (β −0.77, 95% CI −0.97 to −0.56), would rather try (β −0.32, 95% CI −0.50 to −0.14) and easier to quit (β −0.58, 95% CI −0.76 to −0.39).

Purpose To explore how branding and packaging, including plain packaging, might influence attitudes and behavior.

Methods Study design Qualitative. Participants were divided by age category. Eleven focus group interviews were undertaken to explore perceptions of different cigarette brands, the role of package design in communicating brand images, and how participants perceived cigarette packages when important design elements such as colors, symbols, logos, and branded fonts were removed. Participants were presented with branded packages and two versions of plain packages of four popular brands.

Sample N=69 (aged 16-50) daily, occasional and former smokers and nonsmokers

Location Norway

Analysis All interviews were videorecorded, transcribed, and analyzed using the NVivo8 software package for qualitative analysis. The analysis was performed systematically, beginning with several rounds of transcript reading followed by thematic coding and organization of codes into larger themes.

Results Distinct images of brands and user identities associated with these were narrated. Elements of the package design such as colors, images, and fonts were described as configuring brand images. Compared with current, completely branded cigarette packages, packages that displayed progressively fewer branding design elements were perceived increasingly unfavorably and as detracting from the images that packages otherwise communicate.

Purpose To determine whether smokers smoking from packs required under Australia’s plain packaging law had different smoking beliefs and quitting thoughts, compared with those still smoking from branded packs.

Methods

Study design Cross-sectional survey during the roll-out phase of the law in November 2012, analysed by timing of survey. Data was part of Victorian Smoking and Health Survey and administered by telephone. Outcomes were perceived quality and satisfaction of cigarettes compared with 1 year ago, frequency of thoughts of smoking harm, perceived exaggeration of harms, frequency of thoughts of quitting, quitting priority in life, intention to quit, approval of large graphic health warnings and plain packaging.

Sample N=536 adults (18 years and over); cigarette smokers with a usual brand
72.3% smoked from a plain pack
27.7% smoked from a branded pack

Location Australia (Victoria)

Analysis Variables associated with plain or branded pack use at p<0.25 were included as covariates in multivariate logistic regression analyses. Additional models controlled for the proportion of the sample interviewed during each survey week who reported smoking from a plain pack. In a sensitivity analysis, all analyses were repeated for brand loyal smokers, defined as those who had been smoking the same brand for a year.

Results Compared with branded pack smokers, those smoking from plain packs perceived their cigarettes to be lower in quality, tended to perceive their cigarettes as less satisfying than a year ago, were more likely to have thought about quitting at least once a day in the past week and to rate quitting as a higher priority in their lives. Plain pack smokers were more likely to support the policy than branded pack smokers. Branded and plain pack smokers did not differ on measures of less immediate smoking intentions, frequency of thoughts about harms or perceived exaggeration of harms. Appeal outcomes, but not other outcomes, were sensitive to the extent of roll-out, with responses from branded pack smokers approaching those of plain pack smokers, once 80% of survey respondents were smoking from plain packs 1–2 weeks before the December implementation date.

Purpose
To examine the impact of pictorial cigarette-warning labels, warning-label message framing and plain cigarette packaging, on young adult smokers’ motivation to quit.

Methods
Study design
Experimental, randomised to one of four conditions, with two-by-two factorial design. Participants viewed online images of four cigarette packs with warnings about lung disease, cancer, stroke/heart disease and death. Packs differed across conditions by (1) warning message framing (gain vs loss) and (2) packaging (branded vs plain).

Sample
N=740 Smokers, young adults 18–30 years

Location
US

Analysis
Bivariate analysis identified demographic and smoking-related characteristics for inclusion as covariates in multivariable analyses (p<0.05). Paired t tests examined differences in motivation to quit between the four warning labels for full sample and separately by experimental condition, with Bonferroni correction (critical α=0.05/4 given four tests). Analysis of covariance (ANCOVA) assessed motivation to quit on average for all packs and individually for each of the four conditions based on framing and packaging. Following main effects for an interaction between message framing and packaging, evaluated pair-wise adjusted least square mean differences between all four study conditions using Tukey’s posthoc adjustment.

Results
Pictorial warnings about lung disease and cancer generated the strongest motivation to quit across conditions. Adjusting for pretest motivation and covariates, a message framing by packaging interaction revealed gain-framed warnings on plain packs generated greater motivation to quit for lung disease, cancer and mortality warnings (p<0.05), compared with loss-framed warnings on plain packs.
Purpose. We aimed to assess change in cigarette pack retrieval time in small retail outlets following the introduction of plain packaging in Australia on December 1, 2012.

Methods. Study design. A sample of 303 milk bars, convenience stores, petrol stations and newsagents was selected in four capital cities, stratified by area socioeconomic status. In June and September (baseline months), the first 2 weeks of December 2012, and February 2013, stores were visited by trained fieldworkers who requested a cigarette pack of a pre-determined brand, variant and pack size, unobtrusively recording the time from the end of the request to when the pack was scanned or placed on the counter.

Sample. Other
N=303 small tobacco retailers

Location. Australia (Sydney, Melbourne, Adelaide and Perth)

Analysis. Logistic regression analysis compared proportions of binary outcomes in stores across months. Wald $\chi^2$ tests were used to examine main effects of covariates with 3 categories or more. Analysis of covariances (ANCOVAs) compared mean retrieval time across months and within months across store types and to produce adjusted means. Bonferroni-adjusted post hoc pairwise comparisons were performed to examine differences in adjusted means between subgroups. Differences in the incidence of extraneous factors affecting the measurement of retrieval time across months were examined with $\chi^2$ tests.

Results. In multivariate analysis, December retrieval time (12.43 s) did not differ from June (10.91 s; $p=0.410$) or February (10.37 s; $p=0.382$), but was slower than September (9.84 s; $p=0.024$). In December, retrieval time declined as days after plain packaging implementation increased ($\beta=-0.21$, $p=0.011$), returning to the baseline range by the second week of implementation. This pattern was not observed in baseline months or in February. Sensitivity analyses showed that results were robust to the variability in purchasing circumstances in tobacco retail outlets.

**Purpose**
To investigate whether there are differences in activation in brain areas related to threat (amygdala) and reward (nucleus accumbens) when viewing plain and branded packs of cigarettes, and whether this differs between non-smokers, weekly smokers and daily smokers.

**Methods**

**Study design**
Participants underwent a single functional magnetic resonance imaging scan whilst viewing images of plain and branded cigarettes.

**Sample**
A total of 72 participants were recruited from Bristol, and after exclusions due to poor quality scans, data from 19 non-smokers, 19 weekly smokers and 20 daily smokers were available for analysis.

**Location**
Bristol, England

**Analysis**
Whole-brain analyses were conducted from the single functional magnetic resonance imaging scans of the participants.

**Results**
The analyses indicated that the presentation of branded as compared with plain pack increased activation in the upper visual field around the calcarine sulcus among both non-smokers and weekly smokers. However, this activation was attenuated among daily smokers. Furthermore, bilateral region of interest analyses in the amygdala and nucleus accumbens indicated differences in brain activation in the right amygdala among non-smokers and weekly smokers when they viewed branded an plain packages of cigarettes, but this difference was not observed among daily smokers.
Hogarth L, Maynard OM, Munafò MR. Plain packaging abolishes elicitation but not reinforcement of instrumental tobacco-seeking. Economic and Social Research Council, Medical Research Council.

**Purpose**
To test the possibility that plain packaging degrades the discriminative stimulus properties of tobacco products, reducing the capacity of these stimuli to elicit instrumental tobacco-seeking and the possibility that plain packaging reduces the perceived reinforcement value of tobacco as an outcome, thereby reducing instrumental tobacco-seeking.

**Methods**

**Study design**
Two experiments were undertaken at the University of Bristol to test these accounts. In experiment 1, smokers were trained on a concurrent choice procedure, in which they learned that two responses earned branded cigarettes and chocolate, respectively, before images of plain and branded packs were tested for capacity to elicit the tobacco choice in extinction. In experiment 2, smokers completed the same procedure except that concurrent choice was between cigarettes from either plain or branded packs versus chocolate.

**Sample**
Convenience sample of adult smokers (Experiment 1, n=23, Experiment 2, n=121)

**Location**
Bristol, England

**Analysis**
Images of plain and branded packs were tested for capacity to elicit the tobacco choice in extinction.

**Results**
Both experiments found that images of branded packs elicited tobacco choice but images of plain packs did not. By contrast, overall concurrent choice preference in Experiment 2 was not different between plain and branded packs, but this preference measure did correlate with cigarettes smoked per day.

**Purpose**
To investigate the effectiveness of plain tobacco packaging.

**Methods**

**Study design**
Randomised controlled trial of smoking behaviour and attitudes when using plain as compared to branded packs. The primary outcomes were number of cigarettes smoked, and volume of smoke inhaled per cigarette, measured using a portable smoking topography monitor. Secondary outcomes were taken after the 24-hour period and comprised self-reported ratings of motivation to quit smoking, cigarette taste, experience of smoking from the cigarette pack, experience of smoking the cigarette, attributes of the cigarette pack, perceptions of the on-pack health warning, changes in smoking behaviour, and views on plain packs.

**Sample**
128 Adult regular smokers were randomised to receive their regular brand of cigarette in a plain Australian pack or a branded United Kingdom pack, and used these over a 24-hour period. 64 were randomised to plain packs and 64 to branded packs.

**Location**
Bristol, England

**Analysis**
Analyses were conducted using linear regression, adjusted for age, sex, heaviness of smoking at baseline and, where appropriate, self-reported ratings at baseline.

**Results**
Smokers randomised to the plain pack condition smoked on average fewer cigarettes than those randomised to the branded pack condition and inhaled more smoke per cigarette, but in both cases the confidence intervals were wide and included the null. Secondary outcomes indicated that smokers randomised to the plain condition rated the experience of smoking from the cigarette pack more negatively, rated the cigarette pack more negatively and rated the health warning as more impactful.

**Purpose**
The present study aims to establish whether familiarity was the most accurate explanation as to why regular smokers do not attend cigarette pack health warnings.

**Methods**

**Study design**
Eye-tracking was used as participants viewed branded, plain and blank packs of cigarettes with familiar and unfamiliar health warnings. The number of fixations to health warnings and branding on the different pack types were recorded. Eye-tracking equipment was used to measure the number of saccades made to health warnings and branding on the different pack types.

**Sample**
A convenience sample of 30 adult dependent smokers participated. Participants were required to smoke five or more cigarettes a day and smoke within 1 h of waking. All participants were aged 18 to 40.

**Location**
Bristol, England

**Analysis**
Analysis of variance was conducted. The blank pack had all branding removed, and only the health warning present. Eye-position data were analysed. A 2 (eye gaze location: health warning, branding) x 3 (pack type: branded, plain, blank) x 2 (health warning familiarity: familiar, unfamiliar) analysis of variance was used to analyse the data on a number of saccades.

**Results**
Results indicated that regular smokers were biased towards fixating the branding rather than the health warning on all three pack types. This bias was smaller, but still evident, for blank packs, where smokers preferentially attended the blank region over the health warnings. Time-course analysis showed that for branded and plain packs, attention was preferentially directed to the branding location for the entire 10s of the stimulus presentation, while for blank packs this occurred for the last 8s of the stimulus presentation. Familiarity with health warnings had no effect on eye gaze location.

**Purpose**
To test whether prevalence of cigarette pack display and smoking at outdoor venues, and pack orientation changed following the introduction of plain packaging and larger pictorial health warnings in Australia.

**Methods**

**Study design**
Between October and April 2011-2012 (pre-plain packaging, pre-PP) and 2012-2013 (post-plain packaging, post-PP), we counted patrons, smokers, and tobacco packs at cafés, restaurants, and bars with outdoor seating. Pack type (fully-branded, plain, or unknown) and orientation were noted.

**Sample**
Eligible venues included cafes, restaurants, and bars with outdoor seating visible from the footpath.

**Location**
Australia

**Analysis**
Rates of pack display, smoking, and pack orientation were analysed using multilevel Poisson regression. Socioeconomic Indices for Areas (SEIFA) 2011 Index of Relative Disadvantage to determine SES for each cafe strip.

**Results**
Pack display declined by 15% (adjusted Incident Rate Ratio [IRR]=0.85, 95% Confidence Interval [CI]=0.79-0.91, p<.001), driven by a 23% decline in active smoking (IRR=0.77, 95% CI=0.71-0.84, p<.001) between phases. The decline in pack display coincided with the full implementation of plain packaging from December 2012, was stronger in venues with children present, and was limited to mid- and high-socio-economic (SES) areas. The proportion of packs oriented face-up declined from 85.4% of fully-branded packs pre-PP to 73.6% of plain packs post-PP (IRR=0.87, 95% CI=0.79-0.95, p=.002). Alternately, the proportions concealed by phones, wallets or other items (4.4% of fully-branded packs pre-PP and 9.5% of plain packs post-PP; IRR=2.33, 95% CI=1.72-3.17, p<.001) and in external case (1.5% to 3.5% of all packs; IRR=2.79, 95% CI=1.77-4.40, p<.001) increased. Low-SES areas evidenced the greatest increase in pack concealment and the greatest decline in face-up pack orientation.

**Purpose**
To investigate the impact of plain packs of cigarettes on smoking behaviour and attitudes.

**Methods**

**Study design**
Parallel group randomised trial in a smoking laboratory at the University of Bristol and participants’ day-to-day environments. Participants were randomly allocated to smoke their usual brand of cigarettes for 24 hours, using either a plain or branded pack.

**Sample**
128 male and female daily smokers, all of whom provided primary outcome data. Participants were required to smoke at least five cigarettes a day and smoke within one hour of waking.

**Location**
Bristol, England

**Analysis**
Primary outcomes were number of cigarettes smoked and volume of smoke inhaled per cigarette. Secondary outcomes were self-reported ratings of motivation to quit smoking, cigarette taste, experience of smoking from the cigarette pack, experience of smoking the cigarette, attributes of the cigarette pack, perceptions of the pack health warning, changes in smoking behaviour, and views on plain packs. Analyses were conducted using linear regression, adjusted for age, sex, heaviness of smoking, baseline, and, where appropriate, baseline ratings.

**Results**
Smokers randomised to the plain pack smoked on average 0.58 (95% Confidence Interval [CI] +0.48 to -1.63) fewer cigarettes in the 24 hour study period, and inhaled an average of 54.78mL (95% CI -112.5 to +222.1) more smoke per cigarette, but the confidence interval were wide and included the null. Secondary outcome analysis demonstrated that smokers using plain packs rated the experience of using the cigarette pack more negatively (-0.52, 95% CI -0.82 to -0.22, P=0.001), rated the pack itself more negatively (-1.59, 95% CI -1.80 to -1.39, p<0.001).

**Purpose**
To explore in-depth the response of young adult female smokers (18-35 years) to using dark brown ‘plain’ cigarette packs in naturalistic settings.

**Methods**

**Study design**
Telephone interviews were employed to explore young women smoker’s cognitive, emotional and behavioural response to the use of brown ‘plain’ packs. Participants were recruited in six towns and cities across Scotland to participate in a naturalistic study, where they used plain packs for one week and their own fully branded packs for one week.

**Sample**
187 young female participants completed the study, of which 23 were randomised to participate in a post-study interview.

**Location**
Scotland

**Analysis**
A semi-structured topic guide was used to assess perceptions of the plain pack, feelings created by the pack, feelings about smoking, and avoidant and smoking behaviour and themes were developed.

**Results**
Participants perceived the brown (plain) packs negatively and reported experiencing negative feelings as a result of using the plain pack. Some also commented that they felt more negatively about the product and smoking. A number of participants said that they had engaged in avoidant behavior with the plain pack, such as hiding it, due to their views of the packs and the reaction of others. They also reported cessation behaviour, such as forgoing cigarettes, stubbing cigarettes out early and thinking about quitting, when using the plain packs.

**Purpose**
We explored, for the first time, young adult roll-your-own smokers’ response to using plain packaging in real-world settings.

**Methods**

**Study design**
Naturalistic research was employed. Participants used plain roll-your-own packs for ten days; the plain packs they were provided with contained their usual brand of rolling tobacco and displayed the name of their usual brand. Participants completed two questionnaires to measure their response to their own branded packs and the plain packs.

**Sample**
133 French young adult smokers (18-25 years). Participants were recruited in five cities in France (Paris, Marseille, Metz, Nantes, Toulouse).

**Location**
France

**Analysis**
Questionnaires assessed pack perceptions, brand attachment, product perceptions (e.g. taste, quality, natural), feelings about smoking (satisfying, pleasurable), feelings when using the pack in front of others (embarrassment, image), warning response (credibility, awareness of risks) and smoking-related behaviour (e.g. consumption, quitting).

**Results**
Compared to their own fully branded packs, plain packs were associated with less positive pack and product perceptions, lower brand attachment and less positive feelings about smoking and feelings when using the pack in front of others. Participants were also more likely to report feelings like reducing consumption and quitting when using the plain packs, and more likely to miss out on rolling a cigarette. No significant differences between the two pack types (plain and branded) were found in terms of credibility of warnings and perceptions of levels of tar.
EXCLUDED ARTICLES - PUBLIC OPINION

This section includes articles potentially relevant to plain packaging, but excluded from the primary review based on one of the following: public opinion data, commentary, secondary review of evidence, or not directly related to plain packaging.


Greenland SJ. Cigarette brand variant portfolio strategy and the use of colour in a darkening market. Tobacco Control 2013; 0-7.


