

A comparison of on-pack Quitline information formats

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ABSTRACT

Background Although tobacco packages have evolved to feature health warnings and, in Australia, dissuasive colours, the format of on-pack cessation information has not changed. We compared how alternative Quitline information formats affected smokers' perceptions and choice behaviours, and their likelihood of seeking cessation support.

Methods We conducted an online study comprising a choice experiment using a two (number of panels) by three (panel position: above, middle, below) plus control (current format) design, and a between-subjects comparison of a two-panel format and the control. The sample comprised 608 New Zealand smokers.

Results Relative to the current format, respondents regarded each test format as more effective in communicating cessation information ($p<0.0001$), particularly the two-panel formats. Respondents found the two-panel format tested via paired comparisons significantly easier to read, more visually salient and more likely than the control to encourage them and other smokers to consider quitting (all $p<0.0001$). Heat map comparisons showed that the Quitline number and affirming message were significantly more salient in the test format than in the current format ($p<0.0001$), although the headline and warning explanation were more salient in the control.

Conclusions Reformatting Quitline information could improve its visual salience and readability and capitalise on the dissonance that pictorial warning labels and plain packaging create. Enhancing stimuli that may prompt smokers to try and quit, affirming their decision to do so and prompting the use of cessation support could increase the number and success of quit attempts.

INTRODUCTION

Efforts to reduce smoking prevalence include comprehensive mass media campaigns,¹ more extensive smoke-free areas,² continuing tax increases,³ and larger and more impactful on-pack warnings.⁴ Collectively, these measures have deterred initiation, stimulated cessation and fostered a social environment where smoking is increasingly unacceptable.⁵

Currently, around a third of smokers make at least one attempt to quit smoking each year. Of these, just over a third use cessation support such as nicotine replacement treatments (NRT) or counselling, which roughly doubles the likelihood that they will quit successfully relative to those making unaided quit attempts.⁶ Quitlines have evolved from centres that provide cessation advice to sophisticated multimedia operations that subsidise NRT and offer planning assistance. By offering tailored cessation support and counselling and providing access points using new and emerging media, Quitlines have increased quit success rates,

maintained motivation and minimised relapse.^{7 8} However, despite evidence that Quitline support may significantly increase the likelihood of successful quitting, these tools remain underused relative to their potential. To increase quitting rates, cessation stimuli should recognise that impromptu quit attempts are the norm, provide triggers to prompt immediate action and promote simple, rapid access to cessation support.^{1 9}

Pictorial warning labels (PWLs) address these objectives by using visual imagery to arouse negative emotions that enhance perceptions of risk, create tensions and prompt quit attempts.¹⁰ Studies report that PWLs are significantly more effective than the text-only warnings they replaced, and those featuring highly graphic imagery are more effective than other warning themes.^{11 12} Since PWLs appear on cigarette packages, they have a longevity and utility that mass media advertising cannot match; they reach target audiences directly and efficiently and achieve very high reach and frequency at no cost to governments.^{13 14}

As PWLs may create a strong negative effect that elicits maladaptive responses,¹⁵ they often appear alongside Quitline information, an approach that has significantly increased number recognition and stimulated calls from groups with higher smoking prevalence.^{14 16–19} To date, more than 20 countries have required tobacco packaging to feature Quitline contact details,²⁰ and as more countries introduce PWLs, the potential to complement these with prominent cessation information is high. Even smokers of as few as 5 cigarettes/day will be potentially exposed to on-pack Quitline information 150 times/month and nearly 2000 times/year, while heavier smokers will have correspondingly greater exposure.^{19 21} Evidence that explicit graphic warnings and individual vignettes elicit stronger responses from disadvantaged groups where smoking prevalence is higher^{22 23} suggests that providing on-pack Quitline details could potentially reduce health inequalities (although not all studies have shown this effect).²⁴

Featuring Quitline information on packages can provide an immediate cessation stimulus, particularly when accompanied by an affirming message, such as 'You CAN quit', and evaluations show providing on-pack Quitline information increases in-bound calls. For example, data from nine EU countries where Quitline details appeared on one warning (of the 14 in rotation) showed a strong initial impact on call numbers.²¹ Two years postintroduction, calls remained significantly higher than baseline, even after controlling for other factors likely to increase calls, such as excise tax increases and mass media campaigns. Other countries have also reported sustained increases in call numbers, which suggests that providing on-pack cessation

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information capitalises on smokers' existing dissonance and contributes to a growing tension that eventually culminates in a quit attempt.^{9 21 25 26}

Providing on-pack Quitline details stimulates calls into at least the medium term; optimising the presentation of this information could thus transform cigarette packages from initiation decoys to cessation portals. Despite increase in the call numbers documented, reviews of Quitline awareness indicate that knowledge of contact numbers is not always high and question whether the current format is optimal.^{14 17 27} Our study examined this latter question by testing the relative effect of alternative Quitline information formats on New Zealand smokers' perceptions, choices and projected behaviours.

METHODS

Procedure

We designed and implemented a within-subjects choice experiment to compare eight novel on-pack Quitline information formats with the status quo, as well as a between-subjects comparison of the current format and one of the new information formats. [Figure 1](#) shows examples of novel formats and the current format tested, the latter used as a control; full details of stimuli are provided in an online supplementary file.

New Zealand introduced 14 PWLs in 2008; these currently cover 30% of the front-of-pack surface and 90% of the back-of-pack area. Seven PWLs appear at any one time and rotate over 2-year cycles. We used the current format as a control and commissioned a graphic artist to create 22 alternative back-of-pack formats that featured a larger and more prominent Quitline number, emphasised the affirming phrase: 'YOU CAN QUIT SMOKING', and improved contrast by using a white or green background rather than a black one. We explored smokers' reactions to these formats in a qualitative pretest and reduced the formats tested to eight that participants thought most effectively communicated Quitline information. Ethics approval was provided by an independent reviewer who had delegated authority from the University of Otago's Human Ethics Committee.

We sourced a sample of adult smokers aged 18 years and over from ResearchNow, a New Zealand online panel provider. Panel members received an email inviting them to participate in a study of tobacco packaging; survey participants receive points

for completing studies and can accumulate these to acquire rewards. Once they had accessed the survey website, respondents answered screening questions about their smoking status; those who were not self-defined daily or occasional smokers (who smoked at least once a month) were excluded from the study, as were former and non-smokers. In total, 608 daily or occasional smokers participated in the study, which was conducted between 20 and 27 January 2014.

Experimental design

The new Quitline information formats incorporated two or three panels (see [figure 1](#)) and featured each panel element in the top, bottom or middle position. This process resulted in six versions of the 'three-panel' format and two of the 'two-panel' format, which represented all possible combinations of panel elements and positions. Packs with two panels used a white and a colour block to communicate Quitline details and an affirming message, while three-panel packs used one white and two coloured blocks (see online supplementary file). These eight formats allowed a comparison of the 'two-panel' and 'three-panel' formats relative to the control, as well as each element's position within the two overall formats.

We tested the effectiveness of the eight new formats relative to the current format in a choice experiment that used a balanced incomplete block design with four blocks of nine paired comparisons.²⁸ Each respondent was allocated randomly to one block of choice sets, and for each choice set they identified the option that they thought most effectively displayed the Quitline information.

Paired comparison

We selected the format identified as optimal in the qualitative pretest as the test stimulus in a comparison with the control format (see [figure 1](#)). Respondents saw either the test or control format, and then answered questions about the Quitline information presented on the pack. The final part of the study asked respondents to click on those pack elements they thought would encourage smokers to consider quitting, and respondents could click up to six times on the pack. Each pack was divided into six areas corresponding to different design components, but these areas were not visible to respondents and only one click per area was recorded. Respondents' clicks also enabled

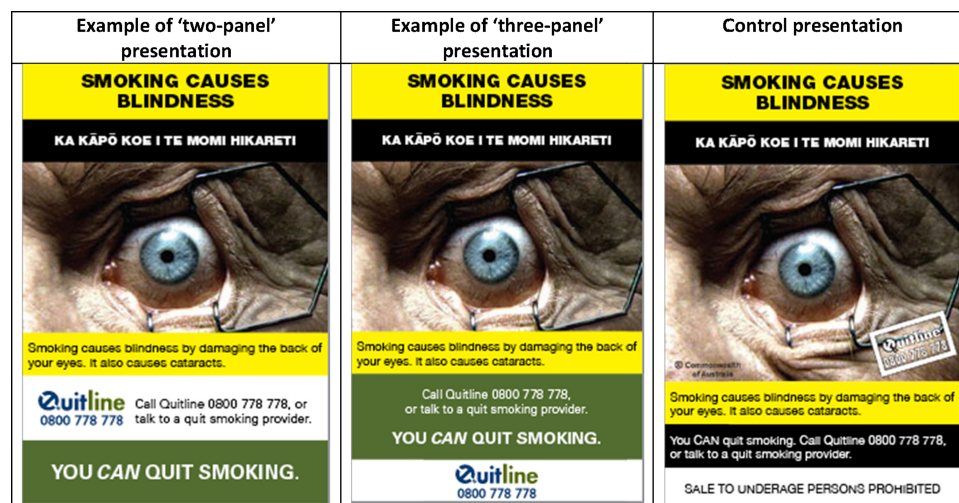


Figure 1 Examples of novel formats and the current format tested, the latter used as a control; full details of stimuli are provided in an online supplementary file.

preparation of 'heat maps' that generated hot spots of varying intensities reflecting the location of each click, wherever it was made. The intensity of these hot spots illustrated the relative impact of different pack design components.

Questionnaire

The choice experiment asked respondents "Which pack do you think displays the Quitline information most effectively?"; each respondent identified one option in each of the nine choice sets. They then viewed either the 'two-panel' presentation (see [figure 1](#)) or the control (current Quitline format, also shown in [figure 1](#)) and rated the stimulus they saw using four, seven-point semantic differential scales. The four statements were: "The information is easy (is not easy) to read"; "The information stands out (does not stand out) on the pack"; "The information would encourage someone (would not encourage someone) who is thinking of quitting to call the Quitline" and "The information would encourage me (would not encourage me) to call the Quitline." We then asked respondents to click on up to six parts of the image they thought were "likely to encourage smokers to try to quit smoking." Finally, we asked respondents about their smoking behaviour, quit experiences and intentions, self-reported noticing of on-pack Quitline information and demographics.

Analysis

We used Scale-Adjusted Latent Class Models (SALCMs), a relatively recent development in the analysis of discrete choice experiments, to identify a statistically defensible number of preference and scale classes from the choice data.²⁹ This approach recognises that respondents may differ in their preferences for options presented, in their scales (ie, choice consistency) or both. Failure to account for differences in choice variability can lead to biased and misleading conclusions about preferences as each person's mean preference parameter estimates are inversely related to their choice consistency.

SALCMs remove the scale factor confound in choice models, giving unbiased estimates that also are more efficient statistically.³⁰ The resulting segment membership is probabilistic, recognising that segment boundaries are fuzzy and avoiding arbitrary demarcations. These analyses were undertaken using the syntax module of Latent Gold V5.0 software that allows preference parameters to differ for discrete but unobserved (latent) classes of respondents, while also allowing the underlying variability of random errors to differ between several discrete latent classes. SALCMs also allow membership of latent preference and scale classes to be predicted as functions of demographic and other covariates.

To compare perceptions of the individual stimuli in the comparison test, we used independent sample *t* tests to estimate differences between the mean scores and sample proportions. These analyses were undertaken using SPSS V21. The data for these latter analyses were weighted so that the age-sex distribution of each subsample matched that of the New Zealand smoking population.

RESULTS

Sample characteristics

In total, 608 respondents completed the study. [Table 1](#) summarises the overall sample characteristics.

Choice experiment

We fitted an SALCM using the sociodemographics shown in [table 1](#) and the rated effectiveness of the different Quitline

Table 1 Sample characteristics

| Characteristic | Per cent (n=608) | Characteristic | Per cent (n=608) |
|----------------|------------------|--------------------------|------------------|
| Gender | | Smoking status | |
| Male | 41.6 | Daily smoker | 73.2 |
| Female | 58.4 | Social/occasional smoker | 26.8 |
| Age group | | Quit probability* | |
| 35 and under | 50.3 | Low | 25.2 |
| Older than 35 | 49.7 | Medium | 39.4 |
| Ethnicity | | High | 34.9 |
| European/other | 77.2 | Addiction level | |
| Māori/Pacific | 11.7 | First cigarette ≤30 min | 53.5 |
| Asian | 11.1 | First cigarette >30 min | 46.5 |
| Education† | | Recent quit attempt‡ | |
| Low | 44.2 | Yes | 33.2 |
| Medium | 39.4 | No | 66.8 |
| High | 34.9 | | |

*Quit probability was estimated using an 11-point scale anchored by 0=no chance/almost no chance (or making a quit attempt) and 10=certain/almost certain (or making a quit attempt). Low ≤3; medium 4–6; high ≥7.

†Low education refers to respondents with school-level qualifications only; medium education refers to those with postsecondary school but subdegree qualifications; high education refers to those with a bachelor's degree or above.

‡Recent quit attempts were defined as any respondent who had made a quit attempt lasting 24 h or longer at least once during the past 6 months.

information formats, to capture preference heterogeneity and choice variance. We estimated a number of models iteratively to ensure reliable estimates of the number of classes and final model estimates. The final model was selected on the basis of minimising Bayesian information criterion (BIC) = $-2L + m\log(n)$, where *L* is the model log-likelihood with *m* parameters and *n* observations.

The best statistical model had two preference classes (ie, selection of the nine options varied by segment) and one scale class (ie, choice consistency did not differ across segments). We also identified covariates that explained differences in the two preference segments, that is, these were significantly associated with segment membership probabilities. [Table 2](#) shows the parameter estimates for each test format and the current (or control) format and presents results for the whole sample and the two preference segments identified.

[Table 2](#) shows Quitline formats with two-colour panels, which were considered significantly more effective than the control (0.86, CI 0.75 to 0.97, *t*=24.7, *p*<0.0001; 0.75, CI 0.64 to 0.86, *t*=23.8, *p*<0.0001). The two-colour stimuli had the largest positive coefficients, indicating that respondents chose them as more effective formats than options with smaller positive, or negative, coefficients. While all 'three-panel' formats were also considered significantly more effective than the control, they were significantly less attractive than both the 'two-panel' formats (least preferred the two-panel format 0.75, CI 0.64 to 0.86, *t*=23.8, *p*<0.0001; cf. most preferred the three-panel format 0.36, CI 0.25 to 0.47, *t*=18.6, *p*<0.001). Within the 'three-panel' options, formats where the two 'green' panels were separated were generally perceived as more effective than those with contiguous 'green' panels (see the middle image in [figure 1](#)).

Both preference segments regarded the test formats as more effective than the status quo, but differed in their responses to the stimuli tested. Segment 1 members saw the test stimuli as similar while segment 2 members exhibited markedly different choices with much larger differences evident among the overall

Table 2 Multinomial Logit and Latent Class parameter estimates

| Format options | Whole sample (N=608) | | | Segment 1 33.8% | | | Segment 2 66.2% | | |
|-----------------------------|-------------------------|---------------------------------------|------------------|------------------------|---------------------------------------|------------------|------------------------|---------------------------------------|------------------|
| | Estimate (CI) | t Value of difference from control | Significance (p) | Estimate (CI) | t Value of difference from control | Significance (p) | Estimate (CI) | t Value of difference from control | Significance (p) |
| Two-panel | | | | | | | | | |
| 1 | 0.86 (0.75 to 0.97) | 24.7 | <0.001 | 0.25 (−0.09 to 0.59) | 2.55 | <0.050 | 1.48 (1.13 to 1.83) | 11.9 | <0.001 |
| 2 | 0.75 (0.64 to 0.86) | 23.8 | <0.001 | 0.24 (−0.09 to 0.57) | 2.76 | <0.010 | 1.15 (0.88 to 1.42) | 11.3 | <0.001 |
| Three-panel | | | | | | | | | |
| 3 | 0.36 (0.25 to 0.47) | 18.6 | <0.001 | 0.22 (−0.07 to 0.51) | 3.59 | <0.010 | 0.51 (0.30 to 0.72) | 10.7 | <0.001 |
| 4 | 0.19 (0.08 to 0.30) | 15.1 | <0.001 | 0.22 (−0.05 to 0.49) | 3.39 | <0.010 | 0.31 (0.11 to 0.51) | 11.3 | <0.001 |
| 5 | 0.18 (0.07 to 0.29) | 19.0 | <0.001 | −0.09 (−0.34 to 0.16) | 3.57 | <0.010 | 0.49 (0.26 to 0.72) | 11.0 | <0.001 |
| 6 | 0.14 (0.03 to 0.25) | 20.6 | <0.001 | −0.13 (−0.38 to 0.12) | 1.82 | <0.100 | 0.41 (0.18 to 0.64) | 10.9 | <0.001 |
| 7 | −0.22 (−0.33 to −0.11) | 18.9 | <0.001 | 0.00 (−0.26 to 0.26) | 2.62 | <0.010 | −0.31 (−0.53 to −0.09) | 9.6 | <0.001 |
| 8 | −0.51 (−0.62 to −0.40) | 12.4 | <0.001 | 0.09 (−0.24 to 0.42) | 3.09 | <0.010 | −0.97 (−1.41 to −0.53) | 6.9 | <0.001 |
| Current format (control) | −1.75 (−1.90 to −1.60) | | | −0.80 (−1.32 to −0.28) | | | −3.08 (−3.63 to −2.53) | | |

sample estimates. Segment 2 was the largest preference segment (66% of the sample) and had significantly older smokers ($p=0.009$) and significantly fewer Asian respondents ($p=0.029$). More generally, this segment also had a higher proportion of Māori and Pacific smokers ($p=0.079$) and smokers with lower education levels ($p=0.088$), but a higher proportion of smokers who intended to quit ($p=0.100$). While these latter differences were not significant at the 5% level, they nevertheless suggest that preference for the revised formats was strongest among respondents from more disadvantaged groups. Differences between other attributes did not approach significance.

Comparison test

Respondents viewed either the ‘two-panel’ format (figure 1) or the control (current Quitline format, also shown in figure 1) and rated the stimulus using four, seven-point semantic differential scales. Table 3 contains the mean values for each scale and shows that the ‘two-panel’ format was significantly easier to read ($p<0.0001$) and enabled the information to stand out more effectively than the control format ($p<0.0001$). Respondents also believed that the test format was significantly more likely to encourage someone thinking of quitting to call the Quitline ($p<0.0001$) and that it would be more likely to encourage them personally to call the Quitline ($p<0.0001$).

Finally, respondents viewed the image again and ‘clicked’ on up to six parts of the pack they thought likely to encourage smokers to try to quit smoking. Clicks were recorded for six areas corresponding to either the graphic warning image or one of five panels of text (or the Quitline number ‘box’ in the control pack). The six pack areas were predefined (and did not cover the whole pack), but were not apparent to respondents. Table 4 outlines the proportion of clicks within each area. In addition, the survey software we used (Qualtrics) generated coloured ‘heat maps’ showing the relative intensity of ‘clicks’ for each part of the two-pack images (these reflect exactly where on the images the respondents clicked); see figure 2.

The heat maps show clear differences between the two formats and their relative effectiveness in encouraging quit attempts. For the control, only two elements of the pictorial warning (the ‘eyeball’ at the centre of the warning and the ‘Smoking causes blindness’ message) were selected by more than two-thirds of respondents. Just under half clicked on the ‘You can quit smoking’ message, while a quarter clicked on the Quitline number. By contrast, for the ‘two-panel’ format, 90% of respondents clicked on the affirming message, ‘You can quit smoking’, while 70% clicked on the Quitline logo and number. Clicks on the ‘eyeball’ image and Māori translation did not differ significantly from the control, though fewer respondents exposed to the ‘two-panel’ format clicked on the ‘Smoking Causes Blindness’ headline and explanatory message.

DISCUSSION

Since most smokers will make multiple quit attempts before becoming smoke-free, environmental triggers are crucial to promote cessation and support other measures aimed at reducing overall smoking prevalence.⁹ As many quit attempts are unplanned, declines in smoking prevalence depend on ongoing exposure to stimuli that prompt repeated cessation attempts until smokers ultimately become smoke-free. Since smokers making supported quit attempts are more likely to become smoke-free than those who make unassisted quit attempts,^{8 27} stimuli that serve the dual purpose of triggering quit attempts

Table 3 Comparison of control and reformatted Quitline information presentation

| Looking specifically at the Quitline information on this pack, how would you assess this information on each of the scales below?* | Quitline information presentation | | |
|--|------------------------------------|--|---------------------------------------|
| | Control format mean and SE (n=301) | 'Two-panel' format mean and SE (n=307) | Significance of p for mean difference |
| Information is easy to read | 2.84 (0.104) | 5.01 (0.103) | <0.0001 |
| Information does stand out on the pack | 2.59 (0.100) | 4.88 (0.098) | <0.0001 |
| Information would encourage someone who is thinking of quitting to call the Quitline | 2.92 (0.096) | 4.53 (0.093) | <0.0001 |
| Information would encourage me to call the Quitline | 2.58 (0.094) | 3.74 (0.105) | <0.0001 |

*Seven-point semantic differential scales, with the 'positive' end of each scale shown.

and facilitating access to quit support should increase cessation rates and success.

To date, policymakers and researchers have focused their interest on the front of tobacco packages as these communicate brand attributes that position smoking as attractive and appealing to young people.³¹ However, evidence that merely including a Quitline number on the back-of-pack sharply increased calls to Quitlines suggests that the back-of-pack canvas has considerable potential to communicate cessation information.¹⁹

Enhancing the visual salience of Quitline and related cessation information has important implications because smokers see their cigarette pack or tobacco pouch each time they smoke. Complementing larger and aversive PWLs that feature on tobacco packages with more prominent cessation support information could capitalise on and help relieve the increased tension smokers may experience.

Increasing the visual prominence of the free phone number and affirming message significantly influenced smokers' choice patterns and perceptions. Results from the choice experiment show that respondents regarded all test stimuli as more effective formats for communicating cessation information than the current format (control). Test formats using a two-colour panel design were regarded as more effective than those using a three-colour panel; these differences occurred regardless of the panel position and suggest that the simpler format of those tested would optimise the effects observed.

Analysis of respondents' choice patterns revealed two distinct groups in the overall sample. The largest of these responded significantly more positively to the new formats and contained respondents from more disadvantaged groups, including older

smokers, those with less education, and higher proportions of Māori and Pacific smokers. That members of this segment showed a higher likelihood of quitting suggests that more impactful on-pack cessation information could support groups where smoking prevalence remains disproportionately high and address persistent social inequalities in smoking prevalence.¹² Evidence that emotionally evocative and personalised mass media campaigns elicit stronger responses from disadvantaged smokers suggests that coordinating advertising with on-pack warnings and cessation information could further enhance responses from this group.²³

Respondents' perceptions reflected their choice behaviours. The test format scores were above the midpoint score on each item with respect to readability, visual prominence and likelihood of encouraging smokers to call the Quitline. Perhaps predictably, given that a third of the sample had a low probability of trying to quit in the near future, the difference between the likely effect of the test and control formats on respondents' own behaviour was smaller, but still differed significantly. Overall, respondents saw the 'two-panel' format as superior to the status quo on each of the measures examined.

A comparison of heat maps generated for the test and control formats reinforces these differences, with the test format receiving significantly higher 'click' scores for the Quitline information and affirming message. Two elements, the headline 'Smoking Causes Blindness' and the explanatory warning message, received significantly fewer 'clicks' when shown in the test rather than the control condition. However, as the position, presentation and prominence of these elements were the same on both packs, these differences seem unlikely to diminish the overall impact of the test format. Evidence that the visual components shown on the test pack had a markedly greater effect on smokers' perceptions and behaviours supports our argument that differences in textual information are unlikely to have material effects.^{4 10}

Our study has some limitations. Since the two comparison tests were conducted after respondents viewed and considered the relative effectiveness of different presentation formats, they may have been sensitised to these tasks, which in turn may have influenced their evaluations. However, responses to the two formats differed so strongly that it seems unlikely that our findings would not be replicated in a situation where respondents had no prior exposure to the two formats.

The stimuli we developed used the entire back-of-pack surface to communicate cessation information, whereas the current (control) pack uses only 90% of the space available (the remaining 10% communicates sales restrictions or fire standards information). While the increased area allocated to cessation information may have influenced respondents, this

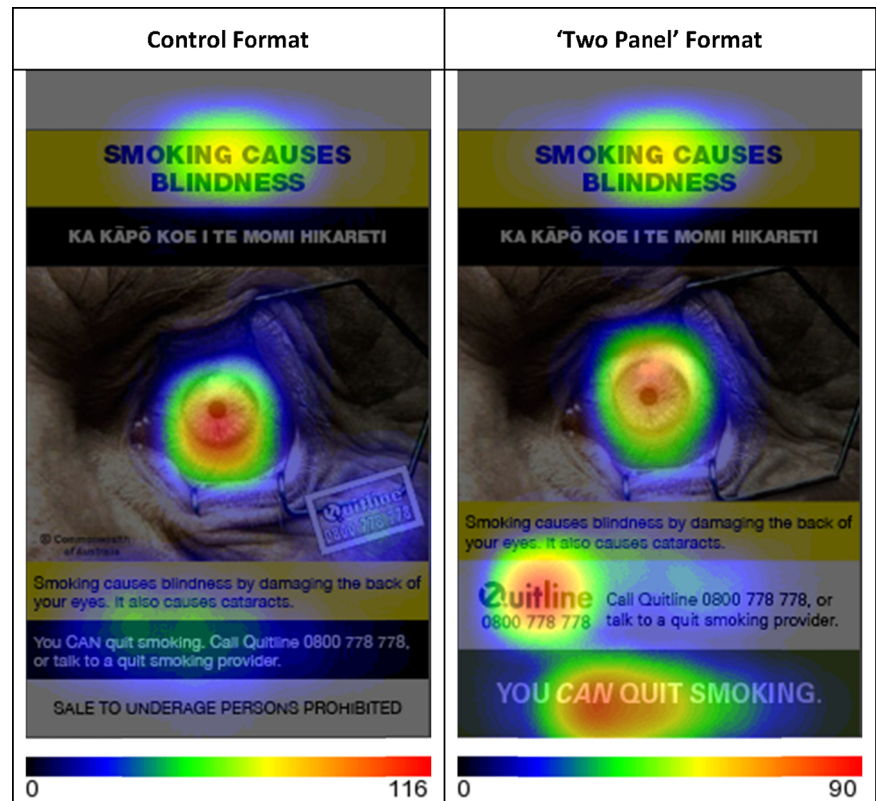
Table 4 Perceived effectiveness of pack areas for the control and 'two-panel' formats

| Pack area | Proportion of clicks* | | Significance of p for difference |
|--------------------------------|----------------------------|--------------------------------|----------------------------------|
| | Control format (n=257) (%) | 'Two-panel' format (n=252) (%) | |
| You can quit smoking panel | 46.3 | 90.9 | 0.000 |
| Eyeball | 83.7 | 77.8 | 0.091 |
| Quitline number box or panel | 28.0 | 70.2 | 0.000 |
| Smoking causes blindness panel | 70.5 | 57.1 | 0.002 |
| Warning message panel | 33.5 | 25.4 | 0.046 |
| Māori translation panel | 4.7 | 3.6 | 0.535 |

*Since respondents were not required to answer this question, there are fewer responses than there are respondents in each subsample.

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Figure 2 The relative intensity of 'clicks' for each part of the two-pack images (these reflect exactly where on the images the respondents clicked).



explanation is unlikely to account for the large differences observed. Although the novel formats tested may have exaggerated the differences elicited, the experimental design involved multiple exposures to the same stimuli, which may have attenuated any novelty effects. Future research could explore these questions further by comparing back-of-pack formats that include regulatory information (eg, sales restrictions) with repeat exposures. Additional studies also could examine the placement of Quitline information on front-of-pack surfaces, following Canada's approach.¹⁴

Our outcome measures include perceptual and behavioural variables widely used to estimate the likely effectiveness of plain packaging relative to different branding levels.^{31–32} Nevertheless, we did not test actual behaviour, and real-life approaches could provide more direct insights into how smokers would use reformatted cessation information. A naturalistic experiment would also allow a comparison of alternative information locations, including front-of-pack and back-of-pack positions.

Given the visual impact of affirming messages, future research could also examine how the inclusion of QR codes affects Quitline access and enrolment, compare alternative messages and test whether different colours enhance the visual prominence affirming statements achieve. This latter question is particularly important if the back-of-pack surface retains branding elements, as these could reduce the contrast in our stimuli and thus undermine their impact(s). Eye-tracking work may provide important insights into the visual impacts of new formats, particularly when brand imagery is present, and would continue innovative work underway in the UK.³³ Future work could also estimate likely increases in demand for cessation support, should government enhance the Quitline information format. While the infrastructure in developed countries is underutilised, developing nations may need to expand their service capacity to meet potential demand.

In summary, our study provides three comparisons of reformatted on-pack cessation information with the status quo and, to the best of our knowledge, is the first study to examine back-of-pack information. Each test reported—the choice experiment, perceptual evaluation and heat map—clearly showed that reformatting on-pack cessation information could greatly increase its visual salience and impact, and stimulate supported quit attempts. To date, plain packaging research and policy has focused exclusively on front-of-pack design, overlooking opportunities to redesign the back-of-pack. Given that the aversive imagery and colour of plainly packaged tobacco induces dissonance, policymakers arguably have an opportunity and a responsibility to provide visually salient information that could help smokers to quit and affirm their decision to do so.

What this paper adds

- ▶ Tobacco packaging offers an important opportunity to promote cessation by foregrounding on-pack smoking cessation information, such as a Quitline number.
- ▶ A choice experiment, comparison of pack perceptions, and heat-map analyses consistently showed that smokers found a simplified two-colour panel format easier to read and more likely to stimulate cessation than the status quo.
- ▶ Policymakers should enhance the presentation of on-pack cessation information, which provides smokers with a resolution to the increased dissonance that dissuasive on-pack stimuli create.

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Contributors JH conceptualised and designed the project; she jointly designed the questionnaire and oversaw the data collection, and led the manuscript development. PG jointly designed the questionnaire and oversaw the data collection, and undertook the initial data analyses. KR was a student working under the supervision of JH and PG; she contributed to the research design, data collection and initial analyses. CE and JL analysed the choice data. All authors have seen and approved the final version; JH is the guarantor.

Competing interests Although they do not consider it a competing interest, for the sake of full transparency the authors note that some of the authors have previously undertaken work for health sector agencies working in tobacco control.

Ethics approval Delegated authority acting under the University of Otago Human Ethics Committee.

Provenance and peer review Not commissioned; externally peer reviewed.

Data sharing statement Our ethics approval limits access to the data to members of the research team. There are no additional unpublished data.

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