Impact of the removal of light and mild descriptors from cigarette packages in Ontario, Canada: Switching to "light replacement" brand variants ☆,☆☆

Joanna E. Cohen *, Jingyan Yang, Elisabeth A. Donaldson

Institute for Global Tobacco Control, Department of Health, Behavior & Society, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, United States

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ABSTRACT

Objective. This study assessed cessation and brand switching among smokers in Ontario, Canada after tobacco companies' voluntary removal of 'light' and 'mild' descriptors from cigarette packages.

Method. We analyzed longitudinal data on brand preference and cessation from a cohort of smokers (n = 632) in the Ontario Tobacco Survey in Canada from 2006 to 2008 with a longitudinal regression model.

Results. While cessation differed by brand variant prior to the ban (7% light vs. 3% regular; $P < 0.05$), it did not differ by brand variant after the ban was implemented. In 2008, when light cigarette brand variants were no longer available, 33% of the sample still reported smoking lights and 31% smoked light replacement brand variants. During each subsequent follow-up, light brand smokers had 2 times the odds of smoking regular brand variants (Adjusted OR: 2.03, 95% CI 1.80,2.29), and almost 5 times the odds of using light replacement brand variants (Adjusted OR: 4.87, 95% CI 4.07,5.84), respectively, compared to continuing to smoke lights.

Conclusions. Even after removing misleading descriptors from cigarette packs, smokers continued to report using light brand variants, and many switched to newly introduced light replacement brand variants. After full implementation of the ban, cessation did not vary by brand variant.

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Introduction

Cigarette packages with descriptors including 'light', 'mild', or 'low-tar' mislead smokers by implying a reduced harm relative to regular cigarettes that does not exist (Borland et al., 2004; Hamilton et al., 2004; Etter et al., 2003; Shiffman et al., 2001; Ashley et al., 2001; Kozlowski et al., 1998, 2000; National Cancer Institute, 2001; Thun and Burns, 2001; Hecht et al., 2005). Smokers hold incorrect beliefs about cigarettes with these terms, and may delay cessation by switching from regular brands to those with light or mild descriptors (Kozlowski et al., 1998; Gilpin et al., 2002). In response, the World Health Organization's Framework Convention on Tobacco Control's Article 11 and its accompanying guidelines recommend that misleading terms, including 'light' and 'mild', should be removed from tobacco product advertising, packaging, and labeling (World Health Organization, 2003, 2013).

More than 40 countries have implemented policies to remove misleading descriptors from product packages. In November 2006, cigarette manufacturers in Canada that controlled 98% of the market share signed agreements with the Canadian Federal Bureau of Competition to remove 'light', 'mild', 'ultra-light' and 'ultra-mild' descriptors from cigarette packaging. The removal of these descriptors, whether as part of a cigarette brand variant name or simply listed somewhere on the package, occurred between December 31, 2006 and December 31, 2007 (Canada Competition Bureau, 2012; Canada Gazette, 2011).

Bans on light descriptors are intended to modify smokers' beliefs regarding the inaccurate health benefits of 'light' or 'mild' cigarettes, and ideally increase smoking cessation. Tobacco companies have responded proactively by repackaging products within a brand family to continue to communicate relative strength and thereby retain smokers (Connolly and Alpert, 2014). Thus, policies banning specific misleading descriptors may not be effective at addressing false beliefs and encouraging smoking cessation if smokers are simply switching to new products that are similarly deceptive.

Indeed, studies of current bans suggest that their effect is brief (Borland et al., 2008). Borland et al. observed a decline in erroneous beliefs after the removal of descriptors in the United Kingdom (UK), but it

was not sustained over time (Borland et al., 2008). In a study comparing the effect of bans in Canada, the UK, and Australia, Yong et al. observed a similar decline and rebounding of false beliefs in all three countries (Yong et al., 2011). A potential reason for the marginal change in beliefs is that cigarette manufacturers introduced replacement products with related terms not covered by the ban, such as 'smooth,' 'mellow,' 'blue,' or 'ultra' (Connolly and Alpert, 2014; King and Borland, 2005; Peace et al., 2009; Brown et al., 2012; Instituto Nacionale de Cancer (Brasil), 2010).

Previous research has explored the effect of policies removing misleading descriptors by assessing the influence of pack color on beliefs and risk perceptions (Hammond et al., 2011; Doxey and Hammond, 2011), as well as examining smokers' ability to identify their usual brand when descriptors are changed (Connolly and Alpert, 2014). However, no research, to our knowledge, has examined the effect of a ban on behaviors, including switching between brand variants. It is important to evaluate how a ban on descriptors affects brand switching to determine whether these policies are sufficient or if more comprehensive options are warranted. The aim of this study was to examine the effect of removing descriptors on brand switching among smokers aged 18 years and older in Ontario, Canada. We hypothesized that smokers will switch to light replacement brand variants after implementation of the misleading descriptor ban.

Methods

The current study uses longitudinal data from the second cohort of adult smokers in the Ontario Tobacco Survey (OTS). The Ontario Tobacco Research Unit developed the OTS, a telephone survey of 7500 adult smokers and non-smokers, to evaluate the Smoke-Free Ontario Strategy and monitor trends in tobacco-related knowledge, exposure, and cessation. The OTS has a cross-sectional and longitudinal hybrid design consisting of six cohorts of smokers assembled through a staggered recruitment strategy. Approximately 750 smokers were selected for each cohort through regionally-stratified random sampling. Each of the cohorts was assessed in six month intervals between 2005 and 2010. A description of the survey methodology has been published elsewhere (Diemert et al., 2010a,b; Bondy et al., 2006).

In this study, data from the second cohort of smokers (n = 751) collected at baseline (Jan–June 2006) and at five subsequent follow-up interviews were used to examine changes in brand variants over time including prior to (Jan–Dec 2006), during (Jan–Dec 2007), and after (Jan–Dec 2008) implementation of the ban on misleading descriptors. Individuals in the second cohort were eligible for the analysis if they responded to the question about brand preference. At baseline, 632 individuals out of 751 participants responded to the brand question. Fifty-two brand responses were unable to be categorized due to interviewer error or coder inability to assign a brand variant category (n = 5), roll-your-own cigarettes (n = 11), and not having a regular brand (n = 36). Sixty-seven respondents refused (n = 2), didn't know (n = 3), or were not current smokers and thus were not asked their usual brand variant during that follow-up interview (n = 62). During each interview, the majority of smokers unable to be classified reported that they did not have a typical brand (Appendix 1). Interviewer error or brand category assignment accounted for less than 10 of uncategorized smokers, except for the final interview when 50 responses were unable to be assigned a brand category.

At each follow-up, individuals who reported smoking in the past six months were asked about their usual cigarette brand. The sample, therefore, includes those who smoked at least 100+ cigarettes in their lifetime at baseline, reported smoking in the past 6 months at baseline, and responded to the brand question during at least two follow-up interviews. At baseline, most of the respondents (75%) were daily smokers. Although 632 individuals' brand data were available at baseline, the number of brand type respondents varied by follow-up, ranging from 516 at Follow-up 1 (July–Dec 2006) to 316 at the final follow-up (July–Dec 2008) (Appendix 1).

Respondents were asked about the cigarette brand variant that they usually smoke at baseline and at each follow-up with the questions — "Do you have a usual brand type?" and "Can you tell us the name of that brand?" During the baseline (Jan–June 2006) and first follow-up (July–Dec 2006) interview, interviewers were prompted to select the respondent's brand from a list. Starting at Follow-up 2 (Jan–June 2007), the interviewers did not have a list but rather recorded the respondent's reported brand verbatim. In all follow-up interviews,

respondents were asked to refer to a pack of cigarettes nearby and were probed about whether the cigarette package listed regular, light, extra light, menthol, mild, special blend, platinum, or other. In addition, the size (e.g. regular or king) listed on the package was recorded. Respondents also could provide additional information that was recorded verbatim, including package color or listed colors on packages (e.g. red).

Former smokers were defined as those who smoked more than 100+ cigarettes in their lifetime but did not smoke in the past 6 months (i.e. since the prior follow-up interview). Former smokers were not asked the brand variant question, and therefore, if a respondent became a former smoker during the course of the study, brand information was not available at that point. For example, if a respondent became a former smoker between baseline and Follow-up 1, we would have brand information at baseline but not for Follow-up 1. However, if a respondent relapsed and was smoking at a later follow-up, brand information was collected again.

Outcome measure

The primary outcome of interest was cigarette brand variant type typically smoked during the 6 months prior to the follow-up assessment. Brand variant is a version of a brand family (e.g. Canadian Classics, Player's) that can be differentiated from other variants in terms of flavor, color, or package design (e.g. Player's Light, Player's Silver) (Bergen et al., 1996).

Cigarette brand variant data were coded by the research team to create three brand variant types — regular, light, and light replacement. Brand variants were assigned into one of the three categories after a review of manufacturer, wholesaler, and trade websites and publications. Regular or full flavor variants included those that did not contain 'light', 'mild', 'smooth', or related descriptors. Light variants were those with 'mild', 'light', 'ultra-mild', 'extra mild', or some variation including 'light smooth'. We defined light replacement variants as any reported brand information indicating a new variant including descriptors not covered by the ban (e.g. special), and colors or numbers denoting a lower relative strength compared to other variants in that brand family. When tobacco companies could no longer use "light", "mild", "low-tar" and similar descriptors to denote relative strength, one strategy they used was to employ color to denote strength. They did this both by using words (e.g., 'red', 'blue', 'gold') and by using actual colors to differentiate different brand variants (e.g., blue or white to denote a lower strength cigarette and red or black to denote a stronger strength cigarette) (Peace et al., 2009; Thrasher et al., 2010; Wakefield et al., 2002). As an added measure to ensure that brand variants categorized as light replacements were actually new variants intended to replace previous light variants, we reviewed industry (i.e. manufacturer, trade, or retailer) publications that stated a product was a replacement for a product with descriptive terms included in the ban. Light and light replacement brands were also matched based on features including published tar content, relative strength, length of the cigarettes, number of cigarettes per pack, or presence of a filter. If we did not have supporting documentation that a product with 'light'-related descriptors or colors was introduced after the ban or was a replacement for a previous product, we coded brand type as missing (ranging from 0.8% to 10% of the brand type responses at each follow-up).

Analysis

Weighted descriptive statistics were used to describe the characteristics of the study population by cigarette brand variant type reported at baseline. The chi-square statistic assessed differences in proportions of light and regular brand variants by gender, education, employment status, and purchase location. The Kruskal–Wallis test compared ordinal variables including heaviness of smoking index (a measure of nicotine dependence) (Heatherton et al., 1989) and perceived health. The Student's t-test with unequal variances assessed differences in mean age.

We examined smoking cessation among respondents for whom smoking status and last known brand type were available at each follow-up interview. A respondent was deemed to have quit smoking and become a former smoker if they smoked more than 100 cigarettes in their lifetime and had not smoked for at least 6 months. A multivariate longitudinal logistic model that accounted for within respondent correlation by specifying an unstructured correlation for the longitudinal study design was used to examine quitting as the dependent variable. The model examined whether brand variant differed by smoking status (former vs. current) after controlling for respondent characteristics.

Because the primary dependent variable consisted of the three brand variant categories – light, regular, and light replacement – a multinomial

Table 1
Smoker characteristics by brand variant type at baseline, January 2006 (n = 632), Ontario, Canada.

	All brand type respondents (n = 632)	Regular (n = 189)	Light (n = 443)	P
Gender, %				
Female	349	30.9	69.1	
Male	283	28.6	71.4	0.526[c]
Age, mean (SD), years	628	44.6 (15.9)	42.3 (14.4)	0.075[d]
Education, %				
High school degree or less	305	36.7	63.3	
At least some college	321	23.4	76.6	<0.0001[c]
Employment status[a], %				
Employed	288	24.7	75.4	0.006[c]
Unemployed	150	37.3	62.7	
Purchase location, %				
Convenience store	319	24.8	75.2	
Gas station	116	27.6	72.4	0.002[c]
Native reserve	90	44.4	55.6	
Other (e.g. supermarket, discount store)	96	34.4	65.6	
Heaviness of smoking index, %				
0–2	256	24.6	75.4	
3–4	211	33.6	66.4	<0.001[e]
5–6	86	45.4	54.6	
Perceived health[b], %				
Excellent/very good	296	29.1	70.9	
Good	224	29.9	70.1	0.338[e]
Fair/poor	111	32.4	67.6	

[a] Employed includes respondents reporting full-time, part-time or self-employment. Unemployed includes: unemployed, student, retired, homemaker, or on disability.
[b] Perceived health was an ordinal variable assessed through self-report of general health on a five-item scale.
[c] Chi-square test.
[d] Student's *t*-test.
[e] Kruskal–Wallis test.

longitudinal model, which accounted for within respondent correlation by specifying unstructured correlation for the longitudinal study design, was used to examine the socio-demographic and other factors influencing brand variant use. Predictors in the model included age, gender, follow-up interview (baseline interview and 5 follow-up interviews), education (at least some college vs. high school degree or less), heaviness of smoking index (scale categories = 0-6), employment (full or part-time employment vs. unemployed, student, retired, or on disability), perceived health status (scale categories = 1–5), and smoking status at each follow-up (former smoker vs. current smoker). This analysis presents smokers' regular and light replacement brand variant use, respectively, in comparison to light brand variant use over time.

At baseline, 16% of respondents had a missing value for cigarette brand variant. We used complete-case analysis in the models because exploratory analyses did not suggest any particular drop-out patterns among those who missed one or more follow-ups, even after exploring missing brand data because of reported smoking cessation. All analyses were conducted using Stata 12 (StataCorp, 2011).

Results

There were 632 brand variant respondents at baseline, with 70% using a light brand variant. Table 1 describes the prevalence of light and regular brand variant use at baseline by respondent characteristics. The brand type reported at baseline did not differ significantly by gender, age, or perceived health. A greater proportion of individuals with at least some college education were light users at baseline as compared to those with a high school degree or less (76.6% vs. 63.3%; P < 0.001). The proportion using light brands was higher among the employed relative to the unemployed (75.4% vs. 62.7%; P < 0.01). Light users represented a greater proportion of those purchasing cigarettes at a convenience store (75.2%) or gas station (72.4%) compared to a Native reserve (55.6%; P < 0.01). Regular brand variant users were more nicotine dependent than light users (P < 0.001).

Cessation analysis

Between 1% and 10% of the sample quit between follow-up interviews (Table 2). At Follow-up 1 (July–Dec 2006), light users were more likely to quit in the past 6 months than regular users (6.6% vs. 2.7%, P <0.05). At Follow-up 2 (Jan–Jun 2007), regular users were more likely to quit in the past 6 months than light users (7.4% vs. 6.7%, P < 0.05). However, differences in quitting by brand variant were not observed at Follow-up 5 (July–Dec 2008), when respondents were asked about brand preference after the voluntary ban had been fully implemented. The longitudinal logistic regression model found that brand preference was not significantly associated with quitting, after controlling for potential confounders such as heaviness of smoking, gender and education (regular vs. light: Adjusted OR 0.49; 95% CI: 0.13, 1.82; light replacement vs. light: Adjusted OR 0.98; 95% CI: 0.29, 3.33) (*not shown*).

Brand variant analysis

Table 3 shows the prevalence of brand variant type by follow-up interview. Over time, the prevalence of reporting light replacement variants increased, up to 30.7% at Follow-up 5 (July–Dec 2008). The prevalence of individuals reporting smoking light brand variants declined steadily over time from 70.1% of respondents at baseline to 33.2% at Follow-up 5.

Table 2
Quitting and brand variant type during prior follow-up interview, 2006–2008, Ontario, Canada.

	Quit[a]	Baseline (Jan–June 2006)[b]	Follow-up 1 (July–Dec 2006) n = 580 % (n)	Follow-up 2 (Jan–June 2007) n = 487 % (n)	Follow-up 3 (July–Dec 2007) n = 427 % (n)	Follow-up 4 (Jan–June 2008) n = 390 % (n)	Follow-up 5 (July–Dec 2008) n = 326 % (n)
Regular	Yes	–	2.7 (5)	7.4 (12)	1.2 (2)	8.4 (13)	3.4 (4)
	No	–	97.3 (183)	92.6 (149)	98.8 (169)	91.6 (141)	96.6 (113)
Light	Yes	–	6.6 (26)	6.7 (21)	4.8 (10)	9.5 (14)	4.7 (5)
	No	–	93.4 (366)	93.3 (293)	95.2 (198)	90.5 (133)	95.3 (102)
Light replacement	Yes	–	–	–	–	4.5 (4)	4.9 (5)
	No	–	–	100 (12)	100 (48)	95.5 (85)	95.1 (97)
P-value			0.024	0.049	0.936	0.068	0.374

Baseline interviews were conducted between January and June 2006. Follow-up 1 interviews were conducted between July and December 2006, follow-up 2 between January and June 2007, follow-up 3 between July and December 2007, follow-up 4 between January and June 2008, and follow-up 5 interviews were conducted between July and December 2008.
[a] Quit is a binary variable comparing respondents who were classified as a former smoker to respondents who were current smokers. Participants who reported having quit smoking at one of the follow-ups were not excluded from further follow-ups. Former smokers were defined as those who smoked more than 100 cigarettes in their lifetime but did not smoke a cigarette in the past 6 months (i.e. since the prior follow-up interview).
[b] Previous brand type information was not collected because this was the baseline interview.

Table 3
Prevalence of brand variant type by follow-up visit, 2006–2008, Ontario, Canada.

	Baseline (Jan–June 2006)	Follow-up 1 (July–Dec 2006)	Follow-up 2[b] (Jan–June 2007)	Follow-up 3[b] (July–Dec 2007)	Follow-up 4 (Jan–June 2008)	Follow-up 5 (July–Dec 2008)
Total brand type respondents[a]	632	516	446	407	362	316
Regular % (n)	29.9 (189)	34.1 (176)	32.9 (147)	41.3 (168)	39.2 (142)	36.1 (114)
Light % (n)	70.1 (443)	65.9 (340)	64.4 (287)	46.9 (191)	37.3 (135)	33.2 (105)
Light replacement % (n)	–	–	2.7 (12)	11.8 (48)	23.5 (85)	30.7 (97)

[a] This table includes respondents for whom brand type data were available during each follow-up visit, demonstrating the prevalence of use at each visit.
[b] The voluntary ban to remove misleading descriptors was implemented between January 2007 and December 2007, during Follow-up 2 and Follow-up 3.

Overall, during each subsequent follow-up interview and after controlling for other covariates, light smokers had 2 times the odds of reporting regular brand use (Adjusted OR: 2.03;95% CI: 1.80, 2.29), and almost 5 times the odds of reporting use of light replacement brand variants (Adjusted OR: 4.87; 95% CI: 4.07, 5.84), respectively, compared to continuing use of light brands (Table 4). Individuals with higher education were significantly less likely to report regular brand use compared to light brand variant use (Adjusted OR: 0.40; 95% CI: 0.18, 0.87), while those who had higher heaviness of smoking index (HSI) scores were significantly more likely to report regular brand variant use relative to light brand variant use (HSI score 3–4: Adjusted OR: 1.66; 95% CI: 1.01, 2.73; HSI score 5–6: Adjusted OR: 2.55; 95% CI: 1.14, 5.73).

Discussion

Even though "light" cigarette brand variants were no longer on the Canadian market following an agreement with the tobacco companies banning them, a sizable proportion (33%) of respondents continued reporting smoking "light" brand variants, and an increasing proportion of respondents reported using new, "light replacement" brand variants. Smokers who reported use of "light" cigarette brand variants switched to "regular" and "light replacement" brand variants over time, even after adjusting for potential confounders. Although bans on "light" and "mild" descriptors are often intended to motivate smokers to quit, cessation did not differ by brand variant type after the ban was implemented. A significant difference in quitting by brand type occurred prior to the ban's implementation and before "light replacement" brand variants emerged in the market.

Given that one-third of respondents continued to report the use of light brand variants, it could be that the misleading 'light' descriptors were not removed from all packs. Although industry reporting of introduced and removed brand variants to the Canadian government is not publicly available, anecdotal evidence from Ontario indicated that light packages were no longer available for sale. Individuals may have also mistakenly reported using light brand variants that were actually

Table 4
Odds ratios from a longitudinal multinomial model for brand type preference, 2006–2008, Ontario, Canada.

Variable	Regular vs. Light (ref)		Light Replacement vs. Light (ref)	
	Adj. Odds Ratio	95% CI	Adj. Odds Ratio	95% CI
Time				
Follow-Up Interview	**2.03**	**(1.80, 2.29)**	**4.87**	**(4.07, 5.84)**
Age				
Older adults (≥30 years)	Ref.	–	Ref.	–
Young adults (18–29 years)	1.19	(0.42, 3.33)	1.30	(0.42, 4.00)
Gender				
Males	Ref.	–	Ref.	–
Females	0.89	(0.41, 1.93)	0.83	(0.37, 1.89)
College education				
High school degree or less	Ref.	–	Ref.	–
At least some college	**0.40**	**(0.18, 0.87)**	0.75	(0.33, 1.73)
Employment				
Unemployed	Ref.	–	Ref.	–
Employed	1.85	(0.82, 4.14)	1.95	(0.83, 4.63)
Heaviness of smoking index				
0–2	Ref.	–	Ref.	–
3–4	**1.66**	**(1.01, 2.73)**	0.86	(0.48, 1.54)
5–6	**2.55**	**(1.14, 5.73)**	0.75	(0.28, 1.98)
Perceived health status				
Excellent/very good	Ref.	–	Ref.	–
Good	0.67	(0.43, 1.05)	**0.42**	**(0.24, 0.72)**
Fair/poor	0.93	(0.48, 1.80)	0.46	(0.21, 1.01)
Quit smoking in prior 6 months[a]				
Did not quit	Ref.	–	Ref.	–
Quit	0.73	(0.22, 2.41)	0.67	(0.15, 2.88)

[a] Quit is a binary variable defined as respondents who become former smokers during the study or those who smoked more than 100+ cigarettes in their lifetime but did not smoke in the past 6 months.

a new, 'light replacement' variant because tobacco companies changed only minor elements of their light packages, allowing consumers to easily link their previous brand to the new variant. For example, Canadian Classics Light became Canadian Classics Silver (Anon, 2007). Similar to the current study, previous research found that one year after the ban on misleading descriptors in the US, smokers still identified their usual brand as light despite its removal from the market (Connolly and Alpert, 2014). As a result of minimal pack changes, smokers reported being able to easily identify their usual brand after the removal of the banned descriptors (Connolly and Alpert, 2014).

The transition of smokers from cigarette brands displaying the misleading descriptors to new brand variants, labeled here as 'light replacement' cigarettes, may illustrate a tobacco industry strategy to undermine the effect of policies banning misleading descriptors, allowing smokers to easily identify the new brand variant packages. As noted in the marketing literature, establishing a visual brand identity is an important way that companies allow consumers to interact with brands through logos, colors, shapes, typefaces and other elements (Phillips et al., 2014; Phillips and McQuarrie, 2004). Furthermore, tobacco industry documents have revealed the importance of cigarette packs for establishing and retaining brand loyalty among smokers (Wakefield et al., 2002). The light replacement brand variants included in the current study contained descriptive terms not included in the ban, such as 'smooth' and 'subtle', as well as colors, such as 'silver'. Similar to previous studies that observed a small and transient change in health beliefs regarding misleading descriptors after their removal (Borland et al., 2008; Yong et al., 2011), the current analysis illustrates that many smokers switch to replacement products with misleading features including alternative descriptors and colors. Therefore, removing a select number of terms may not be enough to reduce the false beliefs associated with light brand variants and similarly deceptive descriptors on cigarette packages. The findings of this study may add further support for plain packaging, or the prohibition of all logos, colors, descriptors and package images. To date, Australia is the only country to implement plain packaging of cigarettes, although New Zealand announced plans to do so (Sweet, 2010; Perry, 2013). Although this study relies on Canadian data because of the availability of relevant longitudinal data before and after the ban, given additional evidence that tobacco companies are using similar "light replacement" strategies in other countries, we believe that it is likely that our findings are applicable to other jurisdictions that have undergone a removal of a discrete list of descriptors for cigarette packages.

The current study has some limitations. Brand variant switching was measured up to one year after the ban took effect, but it may take more time for it to influence smokers' brand preference. Furthermore, 2% of the cigarette market was not covered by the voluntary agreement and it is possible that some of our respondents were indeed smoking a pack with a "light" descriptor on it. Non-response bias is another limitation, including overall attrition in the cohort of total respondents to the survey over time. Further, we did not ask respondents what influenced their choice of a new brand variant nor do we know why some individuals continued to report smoking lights despite their removal from the market. Relatedly, we did not ask whether respondents who switched from light brands to light replacement brands had the false belief that the new replacement brand was safer than regular cigarettes. These are important areas for future qualitative research.

Conclusions

Despite its limitations, this study's strengths include its longitudinal design and its focus on behavior. This study is the first, to our knowledge, to explore the effect of a ban removing misleading descriptors from cigarette packages on reported brand variant type switching and cessation among smokers. Several studies have described smokers' perceptions and beliefs toward cigarette packages that do not include select misleading descriptors (Borland et al., 2008; Yong et al., 2011;

Hammond et al., 2011; Doxey and Hammond, 2011; Mutti et al., 2011; Hammond and Parkinson, 2009; Hammond et al., 2009). This study adds to this literature and illustrates in a cohort of smokers that even after removing misleading descriptors from cigarette packs, a substantial proportion of smokers continue to report using light cigarettes and about one in three smokers report using newly introduced light replacement cigarette brand variants.

Supplementary data to this article can be found online at http://dx.doi.org/10.1016/j.ypmed.2014.08.037.

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