



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

Joanna E. Cohen<sup>\*</sup>, 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

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\* Corresponding author at: 2213 McElderry Street, 4th Floor, Baltimore, MD 21205, United States. Fax: +1 410 614 1003.

E-mail address: [jcohen@jhu.edu](mailto:jcohen@jhu.edu) (J.E. Cohen).

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 Nacional 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

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