Impact of the removal of misleading terms on cigarette pack on smokers' beliefs about Light/Mild cigarettes: Cross-country comparisons

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Abstract

Aim—This paper examines how smokers' beliefs about "light/ mild" cigarettes in Australia, Canada and the UK were affected by the removal of misleading "light/mild" terms from packs.

Design, setting and participants—The data come from the first 7 waves (2002–2009) of the International Tobacco Control Policy Evaluation (ITC) Four-Country Survey, an annual cohort telephone survey of adult smokers in Canada, United States, United Kingdom, and Australia (21,613 individual cases). "Light" and "mild" descriptors were removed in 2003 in the UK, in 2006 in Australia, and in 2007 in Canada. We compare beliefs about "light" cigarettes both before and after the bans, with those of smokers in the US serving as the control condition.

Findings—The proportions of respondents reporting misperceptions about light cigarettes declined between 2002 and 2009 in all four countries. There were marked temporary reductions in reported misperceptions in the UK and Australia but not in Canada following the removal of "light/mild" descriptors.

Conclusions—Removal of "light/mild" descriptors and tar, nicotine and carbon monoxide yield information from cigarette packs is insufficient to effectively eliminate false beliefs. The combination of alternative descriptors and design features that produce differences in taste strength and harshness, independent of actual intakes, are sufficient to produce or sustain the same misbeliefs.

Keywords

Light/Mild beliefs; misconceptions; descriptor ban; misleading terms

INTRODUCTION

It is now well established that so-called "light" or low-tar cigarettes are as harmful as "full-flavour" or regular cigarettes.(1–3) Individual smokers are not able to reduce their risks by "down-switching" from "full-flavour" to "light" cigarettes. However, "light" cigarettes may increase harm at both individual and population levels by reassuring smokers that they are smoking "less harmful" cigarettes, thereby discouraging and/or delaying cessation.(4, 5) In an effort to address the problem of smokers' incorrect beliefs about "light" cigarettes, many countries have begun to implement provisions from Article 11 of the World Health Organization's Framework Convention on Tobacco Control (FCTC) and prohibit advertising that is deemed to be misleading to smokers. The European Union (EU) and Brazil were the first to prohibit the use of "light" and "mild" descriptors in 2003. The intent of banning these descriptors was to eliminate beliefs that cigarettes labeled "light" are less harmful.

Currently, more than 50 countries including the UK (in 2003, as part of an European Union initiative), Australia in 2005–6, and more recently, Canada in 2007, have implemented such policies. The formal introduction of the ban in the UK was accompanied by a high profile television campaign highlighting the equal dangers of all cigarette brands and brand variants. Using data from the first 4 waves of the International Tobacco Control (ITC) Four-Country survey, Borland et al.(6) evaluated the effects of the UK ban on smokers' beliefs about cigarettes labelled "light" or low tar in the first three years following its implementation. Borland et al(6) found the policy change in the UK produced a substantial decline in reported beliefs that "light" cigarettes have relative health benefits. However, the initial decline was not sustained. Borland et al(6) canvassed several reasons as to why this may have occurred. First, cigarette manufacturers substituted new labels and pack colors to replace the banned product descriptors and smokers would have easily learned the relationships between the old and new descriptors. Second, implementation of the 10-1-10 policy requiring manufacturers to reduce maximum tar yields from 12mg to 10mg occurred shortly after the descriptors ban in the UK and may have reinforced many smokers' existing beliefs that tar yield levels are useful indicators of relative harmfulness. Third, the mass media campaign was short-lived and its effects are likely to have dissipated with time.

Using three additional waves of the ITC survey to those reported on in Borland et al(6) (seven waves altogether, collected from 2002–2008), this study provides an opportunity to examine the impact of the labeling change on cigarette packs in Australia and Canada on smokers' beliefs about "light" cigarettes as compared to smokers in the US where no such change occurred.

In Australia, the removal of "light" and "mild" descriptors began to occur in 2005 as a result of a court-enforceable agreement between the Australian Competition and Consumer Commission (ACCC) (a government regulatory agency), and two of the main tobacco companies. Agreement was reached in September 2005 with two of the major tobacco manufacturers (Philip Morris and British American Tobacco Australia) and their products were progressively relabeled over much of the 4th wave survey period. A third company, Imperial Tobacco, settled in early 2006, after this wave was completed. In March 2006 (2 months after Wave 4 of the ITC survey data collection), tar, nicotine and carbon monoxide yield information was also removed from packs. There was a large mass-media campaign (ACCC, 2005), funded by the three tobacco companies, that began just after Wave 4, to educate the public that "light" or low tar cigarettes are not any healthier than regular ones, using the slogan "all cigarettes are toxic" (see Figure 1 – stills from Ad campaign).

Most recently, the Canadian federal Bureau of Competition reached a court-enforceable agreement with three major cigarette manufacturers (Imperial Tobacco Canada, Rothmans

Benson & Hedges, and JTI-Macdonald) to start phasing out "light" and "mild" descriptors from their packaging in January 2007 (at the tail end of Wave 5 data collection) and this was completed by 31 July 2007 with high level of compliance. However, unlike Australia, tar, nicotine and carbon monoxide yield information (both the International Organization for Standardization [ISO] and Health Canada Intensive measures) remained on the packs. In addition, no public education campaign accompanied the removal of "light" and "mild" descriptors, as had been the case in both the UK and Australia. The media coverage on the labeling change was also quite minimal. However, it should be noted that back in 2001 the Canadian government had implemented a national media campaign to educate the public about the deceptiveness of "light" cigarettes, so Canadian smokers may have had more long-standing knowledge.

The aims of this study were to update the original findings on the UK labeling by Borland et al(6) and extend this evaluation by examining how smokers' beliefs about "light" cigarettes in Australia and Canada were affected by labeling change on cigarette packs compared to smokers in the US where no such change occurred. We also examined the impact of the labeling change in Australia, which also included the removal of the ISO emission yields, with that of the UK and Canada where this information remained on packs.

METHOD

Sample and data Collection Procedures

The data are from the first seven waves of the ITC Four-Country survey. Respondents were aged 18+ years, had smoked at least 100 cigarettes lifetime, and at least once in the past 30 days at recruitment. A full description of the ITC methodology and survey data from earlier waves on sampling, including comparisons with national benchmarks, can be found in Thompson et al.(7). Briefly, the ITC cohort was constructed from probability sampling methods (random-digit dialing methods from list-assisted phone numbers) from the population of each country within strata defined by geographic region and community size. The cohort was followed up yearly and a replenishment sample was obtained at each subsequent wave to replace those lost due to attrition, using the same sampling protocol as in Wave one. The baseline wave (October–December 2002) was pre-UK ban, Wave 2 data collection (May–September 2003) coincided with the "light" terms ban in UK, Wave 3 (June–December, 2004) was post-UK ban but well before the labeling change in Australia and Wave 4 (September–December, 2005, approximately 2 years post-UK ban) occurred during the period over which the terms began to be removed from packs in Australia. Wave 5 (October 2006–February 2007) was undertaken post-Australian change and at the start of the labeling change in Canada. Wave 6 (September 2007–February 2008) and Wave 7 (October 2008–February 2009), both occurred well after full implementation in both Australia and Canada. A brief timeline of the data collection and key events related to the "light/mild" labeling change in each of the four countries is presented in Table 1. The samples from all four countries are broadly representative of their respective populations, being recruited from random digit dialing. The demographic profile of the samples for each country can be found in Table 2. Smokers have similar characteristics in the four countries.

ITC Survey Measures

The ITC survey is standardized across the four countries with respondents asked the same questions, with only minor variations in colloquial speech or usual reference. The ITC survey is about 45 minutes long and includes questions about self-reported smoking behavior, including measures of dependence (e.g., time to first cigarette, cigarettes per day, and perceived addiction), quit history, brand information, and key psychosocial measures such as intentions to quit, perceived risk, and attitudes towards tobacco use. Also included

are demographic questions, including age, sex, income, education, and an index of minority status (ethnicity or, in Australia, language spoken at home).

Three questions were used to measure smokers' beliefs about "light/mild" cigarettes prefaced by a statement that the term "Lights" was being used to refer to cigarettes that were being promoted with terms such as Light, Mild or Low in tar. The questions were: (1) "light cigarettes are less harmful than regular cigarettes", (2) "smokers of light cigarettes take in less tar than smokers of regular cigarettes", and (3) "light cigarettes make it easier to quit smoking". Responses to all three items were on a 5-point scale ranging from strongly agree to strongly disagree. The third question was dropped from the survey in wave 5 and hence, a decision was made to exclude this question from our analysis. For the purpose of analysis, we combined the remaining two beliefs items into a scale (correlation across waves: r=.40–.47, all p's <.001) by averaging the scores to form the Lights Benefit Scale (LBS), a modification of the scale used in Borland et al.(6) From wave 4 onwards, we added three questions to help explore other contributing factors to the light beliefs. The first question was: "As you understand it, how closely, if at all, are the tar numbers (for US: on advertisements and sometimes) on packs related to the amount of tar that smokers take into their bodies?" with response options: closely related, somewhat related and not related. From wave 5 onwards, this question was reworded slightly for Australian respondents to answer retrospectively following an introductory statement: "Tar numbers used to appear on all cigarette packs". The other two questions were "If a cigarette tastes lighter, it means you get less tar"; and "The harsher the smoke feels in your throat, the more dangerous the smoke is likely to be", both were rated on 5-point agree-disagree scales.

Statistical Analyses

The analyses were conducted using Stata v10. The current analysis included 21,613 unique respondents who provided complete information for at least one of the seven waves (20.7% provided only one wave of data and the rest provided multiple waves of data). Mean estimates were computed on weighted data. In order to take into account the correlated nature of the longitudinal data, we used generalized estimating equations (GEE) to compute parameter estimates.(8) A strength of GEE is that it allows anyone with at least one wave of data to be included in analyses, thus allowing the inclusion of replenishment sample to help minimize bias due to attrition. We assumed a working correlation structure that is unstructured given the large sample and used robust variance to compute the p-values for the parameter estimates.(9) In the multiple regression analysis, we tested for the effect of country, wave and their interaction on level of endorsement of light beliefs. The interaction between country and wave provided a formal test of whether the pattern of change in perceptions over time in Australia, for example, was significantly different from that of the comparison country. In each of the models, we included the following invariant control variables reported at baseline wave (age, sex, education, ethnicity, income, and wave of recruitment) and also the following time-varying covariates reported at each wave (cigarettes per day, smoking status, and quit recency).

RESULTS

Figure 2 presents the mean level of endorsement of the lights benefits scale (LBS) by smokers in each country measured across seven survey waves. Table 3 presents relevant statistics showing the pattern of change over time in reported endorsement of light beliefs for each country. The size and sign of the regression coefficients indicate the magnitude and direction of the change (negative coefficient being a decline and positive being an increase) in reported light beliefs in relation to the reference wave. First, focusing on the UK data, it shows that the recovery in the false beliefs reported previously(6) at Wave 4 showed a persistent trend over the next 3 survey waves. In Australia, there was a marked drop in

agreement from survey Waves 4 to 5 mirroring the initial drop in misperceptions observed in the UK following the ban on misleading brand descriptors. The Australian decline in misperceptions about lights was at least as low as those seen in Canada, which consistently had the lowest level of these beliefs, but as in the UK, there was a recovery in false beliefs by Wave 7. In Canada, the ban on misleading brand descriptors began shortly before Wave 5 completion where we observed a slight albeit significant ($p<.001$) decline from Wave 4 in misperceptions about lights. However, following Wave 5 there were increases in misperceptions about lights in the two subsequent survey waves ($p<.01$ for both). There was a similar resurgence of these beliefs in the USA. We explored for possible time-in-sample effect and found a small but significant effect ($p<.001$) for all four countries. Those who were already in the study had a lower mean level of endorsement of light beliefs compared to those newly recruited into the study (results not shown). We also conducted parallel analyses using the 2 items in the LBS as separate measures and found essentially the same results, including the time-in-sample effects (results not shown).

Figure 3 provides data on three new measures of labeling change added to the ITC survey in 2005 (Wave 4). Overall, UK smokers were more likely to endorse the belief that cigarettes that taste lighter means you will get less tar and that the harsher the smoke on the throat the more dangerous the smoke is likely to be. By contrast, for belief that the tar numbers on packs/on advertisements are related to the amount of tar that smokers take into their bodies, both UK and Canadian smokers believed this to a greater extent than US or Australian smokers. For all three beliefs, there was a significant country by wave interaction (all p's <.001) with Australia being the only country showing a significant decline in endorsement of these beliefs over the wave immediately following the labeling change while the other countries showed either no change or an increase over the same period.

DISCUSSION

This study showed that the temporary reduction in misbeliefs about "light" cigarettes found in the UK after misleading terms were banned also occurred in Australia. In Canada, the magnitude of the initial decline was much less and recovery was faster, and given overall trends, no clear effect can be attributed to the ban in Canada. In all three countries, the tobacco industry responded to the ban simply by replacing the prohibited terms with systematic pack colour differentials (usually running from darker to lighter to indicate increasing 'lightness'), and alternative descriptors, such as Smooth and Fine which can be understood as code words for "light" and "mild"(10). The level of misbeliefs remained higher in the UK following the ban as compared to the other three countries, including the USA which had not (at the time of the study) implemented any ban on the terms.

This set of analyses, which include three additional waves of data, does not support our previous hypothesis that the implementation of the 10-1-10 policy in the UK shortly after the descriptors ban was responsible for the observed recovery in false beliefs in the UK(6) as similar recovery was found in Australia as well even though the ISO emission yield information was removed as part of its labeling change. It is clear that merely banning misleading brand descriptors, including the removal of ISO yield information, is insufficient to effectively eliminate consumer misperceptions. While the labelling changes and accompanying public education campaigns in the UK and Australia clearly had some beneficial effect in reducing smokers' misperceptions about "light" cigarettes, the beneficial effects in both countries were short-lived.

The educational campaign accompanying the ban, which helps to inform smokers of the reason for the ban, is the most obvious explanation for the observed temporary decline in misperceptions following the labeling change in the UK and Australia. Consistent with this,

the observed reduction in misperceptions from Waves 2 to 5 in the United States corresponds with several widely publicized court cases against the tobacco industry for misleadingly marketing cigarettes labeled as "light". The failure to find a comparable effect in Canada, which did not have an accompanying public information campaign, further supports the argument that the public education campaigns are the critical factor in reducing misperceptions and not the ban on the terms.

An alternative explanation for at least part of the effect would be the role of health warnings on the packs. In both the UK and Australia there was a strengthening of health warnings around the same time as the ban on misleading terms, whereas no such change occurred in Canada. The presence of strong health warnings could reinforce the message that all types of cigarettes are equally harmful, including so-called 'low-tar' ones. Consistent with this suggestion, a recent experimental study showed that when graphic health warnings were placed on smokeless tobacco products, they reduced the consumer appeal of these products and increased perceived risks, including the incorrect belief that smokeless tobacco is equally as harmful as cigarettes.(11) Canada introduced new graphic warnings in December 2000, almost 2 years before the baseline survey and this could at least partially account for the lower levels of misconceptions about "light" cigarettes in Canada at baseline. The presence of strong warnings could also potentially explain why there was no effect following the labeling change in Canada. The main problem with this explanation is that throughout the study period, the USA has had very weak health warnings and levels of beliefs in the US have been consistently lower than the UK, and often comparable with Australia and Canada. Further, a warnings-based explanation cannot explain the temporary effects in the UK and Australia.

Of concern is the upward trend emerging from Wave 5 suggesting that misperceptions are becoming more prevalent after a period of general decline. The reasons for this are unknown. It could be because of a decline in levels of mention of the issue in the media (as part of or independent of deliberate campaigns) and that regular reminders that "light" cigarettes are not less harmful are necessary to overcome natural tendency to perceive milder tasting products as less harmful. However, there is some evidence that is inconsistent with this simple interpretation. The level of misbeliefs in Canada was lower than in the other countries in the early years of the study. It is plausible that this was because of the information campaign run by the Canadian government about a year before our initial survey. We have found little change in misbeliefs in Canada, especially relative to those of smokers in the other countries, at least up until the terms were removed. It is not clear why the effect was sustained here, it could be due to the quality of the initial communication or it could have been due to some reinforcement in general media as the issue remained relevant at least leading up to the ban.

As to why the UK level remained high post-ban, one plausible explanation is that in the UK, the 10-1-10 policy of reducing permitted yields drew smokers' attention to this information and reinforced the belief that these measures had some meaningful relationship to exposures and thus, the adverse health effects. By contrast, in Australia, the yield information was not used or promoted by health authorities in the years prior to its removal, it was rarely present on packs in the US, and it was not promoted in Canada where the information that was there is complex and hard for even experts to readily understand (it has ranges of yields provided for each of 6 constituents).

It might be significant that by the end of this study period UK and Canadian smokers were more likely to believe that tar levels are related to tar intakes than Australian and US smokers, with Australian smokers reducing in these beliefs. This was the only measure where misconceptions were not the greatest in the UK. Coupled with a much stronger belief

that light taste means low tar, it would explain the tendency of UK smokers to believe that Lights are less harmful. Alternatively, it could reflect something about the way UK smokers relate to the questions.

While perceptions of harmfulness can be manipulated by elements of pack design, seemingly independent of yields(12), it is not just packaging design that affects smokers' perceptions. The tobacco manufacturers in the UK achieved the lower tar limit set by the 10-1-10 policy by increasing the percentage of filter ventilation in cigarettes, meaning that total intakes of nicotine remained similar.(13) Cigarettes that have higher levels of filter venting, generally provide lower yield figures, have been typically labelled as "Lights" or "Milds", and tend to taste less harsh(14) and taste is used as an indicator of harmfulness.(15) Changing the pack design has clearly not eliminated these misperceptions as they are created by a combination of the use of filter venting and pack designs designed to evoke images of lightness. The recent move by the Australian government to mandate plain packaging by July 2012 will help to eliminate an important set of cues to differential harm. The effect will be further reinforced by the continual presence of the graphic health warnings along with the quitline telephone number on the standardized packs. However, while filter venting is allowed, along with other engineering features that alter smokers' perceptions of the harshness, and thus by inference harmfulness, of the cigarettes, the crux of the problem will remain.

This study has some important strengths and weaknesses. The samples were broadly representative of smokers in the countries concerned and the survey methods were identical. However, the measures used in the ITC survey to assess false beliefs about "light" cigarettes may underestimate the prevalence of actual beliefs. Many smokers may be reluctant to admit a belief that some cigarettes are less harmful than others, even if they believe it, as many will be aware of the official position of there being no difference in harmfulness. Consistent with this, experimental studies that have presented actual examples of packs and brands with varying descriptors and have asked which was more harmful, have detected far higher levels of false beliefs that "light" brands are less harmful.(16–18) While the discrepancies seen in findings from our survey and those of experimental studies might represent something weaker than a firm conviction on behalf of consumers, it does suggest that smokers at least hold out some possibility of differential harm. This is evidence that the relatively low levels of false beliefs we found represent the tip of an iceberg. A cohort study is not the ideal method to pick up changes in knowledge, as having being asked previously may stimulate increased knowledge seeking and result in the reduction of false beliefs (as we found here).

Based on our findings, current focus by ratifying countries of the FCTC to ban only the "light" and "mild" descriptors (based on Article 11) is clearly inadequate to eliminate the false perception of lower risk of this kind of cigarettes. We are reassured that guidelines adopted by the parties on how to implement bans on terms also recommend elimination of misleading yield information. Moreover, there is a need for action to be accompanied by well-designed and adequately resourced public education to ensure the public understands the rationale for the change and the equivalent harmfulness of cigarettes, independent of how they are marketed. The key lesson for tobacco control (and for public health more generally) is that multifaceted approach is best, one that takes into account a comprehensive analysis of how the various components interact.(19) Such an analysis makes it clear that an integrated set of policy efforts need to be applied coherently, and be sustained over time, in order to effectively eliminate false beliefs, beliefs that are plausibly helping to prolong the epidemic of tobacco use.

Acknowledgments

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Figure 1.
The Australian corrective media campaign about light cigarettes, launched nationally on 26 December, 2005, funded by three major tobacco manufacturers (Philip Morris Limited, British American Tobacco Australia Limited and Imperial Tobacco Australia Limited). Main message: They are all equally toxic. Media coverage: TV, radio, print and billboard. Budget: total AUD 9 millions. Source: ACCC, 2006.
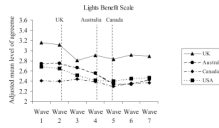
Figure 2.
Adjusted mean (n=20,721) level of endorsement of belief about the health benefit of light cigarettes before and after the implementation of the removal of light and mild descriptors in the UK and Australia. The vertical dotted line indicates when the labelling change occurred for UK, Australia and Canada.

Figure 3.
Beliefs about taste, harshness of smoke and tar numbers on packs (n=12,684). The vertical dotted line indicates the labelling change in Australia and Canada.

Table 1

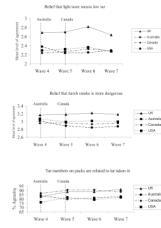Chronological summary of events showing the timeline for data collection for each ITC survey wave and relevant key events pertaining to light or mild cigarettes.

Canada	US	UK	Australia
Dec 2000: New graphic health warnings on cig packs introduced. Dec 2001: Notice of intent to ban light and mild descriptors; legislation never adopted.	Nov 2001: NCI Monograph 13 released, confirms no difference in risk between low-tar/Light and regular cigarettes.		
Oct–Dec 2002: ITC Wave 1 data collection			
	Mar 2003: Philip Morris lost light fraud class action suit in Illinois, & ordered to pay $10B in damages.		
June–Aug 2003: ITC Wave 2 data collection			
	Aug 2004: Light fraud class action suit certification upheld in Massachusetts. Decision & publicity during Wave 3 survey.	Jan 2003: new enhanced text health warnings on packs introduced. Sept 2003: EU ban on light descriptors became effective. Paid media campaign to educate the public accompanied the UK ban. Months prior to this, tobacco companies started replacing the banned terms with new ones like "smooth", "gold" and "silver", and also used colour coding like blue and white as replacement. Jan 2004: EU 10-1-10 policy introduced. Max tar, nicotine, CO yields to apply.	
June–Sept 2004: ITC Wave 3 data collection			
	Dec 2005: Illinois class action case and damages dismissed by Illinios Supreme Court, citing Federal pre-emption. US Supreme Court declines review.		Feb 2005: Tobacco companies started to introduce new terms like "smooth" and "fine" to replace "light" and "mild" in response to a looming ban on the latter terms. May 2005: Through court-enforceable undertakings by Australian Consumer & Competition commission, 2 out of 3 major tobacco companies agreed to remove light/mild descriptors from packs. Nov 2005: 3rd major tobacco company agreed to remove light/mild descriptors from packs. Partial removal before Wave 4 and during.
Oct–Dec 2005: ITC Wave 4 data collection			
	Aug 2006: Federal judge rules in US Department of Justice lawsuit that major tobacco companies misled the public re the health benefits of so-called light cigarettes and ordered them to stop using such descriptors. Ruling remains under appeal.		Dec 2005: $9 million media campaign to educate the public re the Light deception. Mar 2006: ISO yield information was no longer printed on side of packs coinciding with the introduction of graphic health warnings. 2006: Completion of removal of brands (fade out).

Canada	US	UK	Australia
Oct 06–Feb 07: ITC Wave 5 data collection			
Jan 2007: Court-enforceable settlements with the national Competition Bureau, 3 major tobacco companies agreed to phase out light & mild descriptors by July 31. Tobacco industry merely replaced the prohibited terms with new ones like "smooth" and "rich", and also used colour and number coding as replacements.			
Sept 07–Feb 08: ITC Wave 6 data collection			
	Dec 2008: US Supreme Court rules that "Light" cigarette lawsuits not pre-empted by the Federal Cigarette Labelling and Advertising Act of 1965.	Oct 2008: Graphic health warnings introduced.	
Oct 08–Feb 09: ITC Wave 7 data collection			

Table 2

Characteristics of adult smokers in the sample (n=21,613).

	Canada n=5,265	US n=6,291	UK n=5,251	Australia n=4,806
Age (%, years)				
18–24	12.8	11.7	8.5	14.2
25–39	30.3	26.3	31.3	35.6
40–54	36.5	36.6	33.8	34.0
55+	20.4	25.5	26.4	16.1
Sex – Male (%)	46.3	44.9	44.2	46.6
Education (%)				
Low	48.7	45.8	61.1	64.2
Medium	36.5	38.3	25.3	21.9
High	14.8	15.9	13.6	13.9
Income (%)				
Low	28.3	36.9	31.1	26.9
Medium	34.4	33.3	31.5	32.7
High	28.4	22.7	27.6	34.0
No information	8.9	7.1	9.8	6.5
Identified minority group (%)	11.4	20.3	4.9	12.8
Cigarettes per day (%)				
1–10 cigs	31.5	31.3	29.9	29.9
11–20 cigs	42.9	46.1	53.5	40.2
21–30 cigs	21.2	13.2	11.8	22.8
31+ cigs	4.4	9.4	4.8	7.1
Cohort (n)				
Wave 1	2,214	2,138	2,401	2,305
Wave 2	517	684	255	258
Wave 3	545	889	586	532
Wave 4	519	742	503	362
Wave 5	594	745	613	686
Wave 6	556	711	523	539
Wave 7	320	382	370	124

NB. Percentages are based on unweighted data.

Table 3

Regression coefficients showing the pattern of change over time in reported endorsement of light beliefs for the four countries.

		Effect sizes (compared with Wave 1)[a]					
	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7
Canada	Reference	−.009	.023	−.025	−.117 ***	−.052	−.050
US	Reference	−.028	−.163 ***	−.261 ***	−.276 ***	−.226 ***	−.204 ***
UK	Reference	−.032	−.344 ***	−.243 ***	−.329 ***	−.237 ***	−.267 ***
Australia	Reference	.009	−.069 **	−.184 ***	−.402 ***	−.407 ***	−.318 ***

Note: Regression coefficients were adjusted for age, sex, ethnicity, baseline income, baseline education, cigarette per day at each wave, smoking status at each wave, quit recency at each wave, and also wave of recruitment/cohort; Main effect for country, wave and their interaction, were all significant at p<.001;

*
p<.05;

**
p<.01;

***
p<.001

[a] A negative coefficient indicates a decline, while a positive coefficient indicates an increase, in level of endorsement of the Light beliefs (relative to that of the reference wave, where the regression coefficient is set to zero). The size of the regression coefficients indicates their effect sizes.