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Switching to “lighter” cigarettes and quitting smoking

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Abstract

Objective—Smokers who switch to “lighter” cigarettes may be diverted from quitting smoking. We assessed factors associated with switching and the association between switching and (1) making a quit attempt, and (2) recent quitting, yielding a measure of net quitting (attempts × recent quitting).

Design—In 2003, a total of 30 800 ever-smokers who smoked in the past year provided history of switching and 3 reasons for switching: harm reduction, quitting smoking and flavour. Among those who made a past-year quit attempt, recent quitting was defined as ≥90-day abstinence when surveyed. Multivariable logistic regression identified determinants of outcomes.

Results—In all, 12 009 (38%) of ever-smokers switched. Among switchers, the most commonly cited reasons were flavour only (26%) and all 3 reasons (18%). Switchers (vs non-switchers) were more likely to make a quit attempt between 2002 and 2003 (51% vs 41%, $p < 0.001$, adjusted odds ratio (AOR) 1.58, (95% confidence interval (CI) 1.48 to 1.69)), but less likely to have recently quit (9% vs 17%, $p < 0.001$; AOR 0.40 (95% CI 0.35 to 0.45)), yielding lower overall net quitting (4.3% vs 7.0%, $p < 0.001$; AOR 0.54, (95% CI 0.47 to 0.61)). The effects of switching on outcomes were most pronounced for reasons including quitting smoking, whereas switching for harm reduction alone had no association with outcomes.

Conclusion—Compared with no switching, a history of switching was associated with 46% lower odds of net quitting.

So-called low tar and nicotine cigarettes, often referred to as “lights”, now make up about 84% of the US market share¹ and are smoked widely in other countries.² “Lights” were introduced in the 1960s and targeted by the tobacco industry to health conscious smokers who might otherwise quit smoking.^{3 4} In an effort to categorise cigarettes according to the level of nicotine and tar that they contained, the US Federal Trade Commission (FTC) adopted a machine-based method of determining tar and nicotine content of cigarettes that established three groups: ≥15 mg tar, 6 to <15 mg tar and <6 mg tar.⁵ While the FTC never provided explicit guidance on cigarette brand descriptors such as “light” or “mild”, in the US the cigarette industry has used the “light” label to describe any brands with up to 10 mg of tar and 0.8 mg of nicotine, based on the FTC method.⁶ When smoked in real life, these so-called “light” cigarettes deliver amounts of tar, nicotine and other substances to the smoker that are comparable to “regular” cigarettes,^{7–10} and do not lead to a reduction in tobacco-related illness.^{11–13}

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The tobacco industry has been charged with using false descriptors such as “light” and “mild” to provide false reassurance to health-concerned smokers who may otherwise have quit smoking.^{3,4,14} Global misconceptions that “light” cigarettes are healthier have proved to be difficult to dispel, even after implementation of labelling bans and the Framework Convention on Tobacco Control (FCTC) labelling guidelines on such misleading descriptors.^{15–18} Furthermore, a history of ever-switching to a “lighter” or “lower yield” cigarette (hereafter referred to as “switching”) is common, with over a third of US adult smokers reporting having done so for the purpose of attempting to reduce health risks.^{19–21}

Thoroughly understanding the potential consequences of switching is critical, particularly in countries such as the US where debate continues over how to end deceptive cigarette labelling and advertising. The 2006 landmark ruling against the tobacco industry by a US District Court refers to “light” and related labelling as “forbidden health descriptors”,²² and new federal legislation²³ proposes to ban such descriptors. In spite of global efforts to expose the truth about false cigarette labels, the tobacco industry continues to introduce modified cigarettes with claims of reduced harm, possibly replicating the negative public health impact of “lights”.

A key concern about “lights” has been that smokers who switch to “lights” might be less likely to quit, reducing cessation and increasing the disease burden of tobacco. The total number of smokers who quit (“net quitting”) is a function of (1) the percentage making a quit attempt and (2) the percentage of individuals who succeed at quitting. The two may be influenced differentially by switching. In past studies, switchers were more aware of the health risks of smoking, demonstrated more interest in quitting and in some cases (but not all)²⁴ made more quit attempts.^{19,25}

The relationship between switching and successful quitting remains unclear. Two studies, one prospective but of relatively small sample size, failed to find an association between switching to reduce health risks and successful quitting.^{24,25} Three large, nationally representative retrospective studies found reduced successful quitting among smokers who had used or switched to a “lighter” cigarette in order to reduce health risks.^{19–21} Even beliefs about “lighter” cigarettes (as opposed to actually switching) may also influence smoking behaviour: in one study, smokers who believed switching would reduce their health risks were 25% less likely to succeed at quitting smoking in the subsequent year.¹⁶

Most prior studies have had little information on reasons for switching. For example, if switching to reduce health risks resolves the cognitive dissonance between health concerns and smoking,^{16,26} then quit attempts and successful quitting would be expected to be reduced. By contrast, quit attempts and successful quitting might be expected to be higher among those who switch specifically for the purpose of quitting smoking, as these smokers were already expressing an interest in quitting.

Prior research has not fully answered the question of whether switching helps, hinders, or has no bearing on quit attempts, successful quitting, or, perhaps most importantly, on net percentage quitting (attempts \times quitting). Further, prior studies have not addressed whether the various reasons for switching might be associated with different effects on these outcomes. To address these questions, we determined the prevalence of and factors associated with switching, and assessed the association between switching and (1) making a quit attempt, (2) recent quitting (≥ 90 -day abstinence among those making an attempt) and (3) their product, net quitting. We hypothesised these outcomes would vary by reason for switching.

Methods

Data source

We used data collected from the 2003 Tobacco Use Supplement to the Current Population Survey, a large Federal household tobacco survey of the US civilian non-institutionalised population cosponsored by National Cancer Institute and the Centers for Disease Control and Prevention^{27 28} (detailed methodology has been described elsewhere: <http://riskfactor.cancer.gov/studies/tus-cps>). The 2003 overall response rate was 83%; excluding proxies, it was 65%.

Study sample

We focused on 30 800 respondents to the 2003 Tobacco Use Supplement who indicated that they were smoking in 2002 and provided complete information about their own smoking (proxy reports were excluded). Ever-smokers were defined as those who answered “yes” to the question, “Have you ever smoked at least 100 cigarettes in your lifetime?”. This population included current (n = 29 033) and recently quit smokers (n = 1767) (eg, those who had been abstinent for ≥ 90 days when surveyed). Ever-smokers were asked, “Do you currently smoke cigarettes everyday, some days, or not at all?”. There were 24 918 everyday and 4115 non-daily smokers.

History of switching to a “lighter” cigarette

Ever-smokers were asked, “Have you ever switched from a stronger cigarette to a lighter cigarette for at least 6 months?”. Respondents who answered “yes” (defined as “switchers”) were then asked to answer true/false follow-up questions about three possible reasons for switching: “you switched...” (1) “because you felt that a lighter cigarette would be less harmful to your health” (harm reduction); (2) “as a way to quit smoking” and (3) “to get a smoother or lighter flavour”. Respondents who answered affirmatively to two options were asked to rate the most important reason for switching. Because respondents were able to specify multiple reasons for switching, there were eight possible combinations (summarised in table 1) used to create a variable to probe reasons for switching.

Additional covariates

Covariates studied included sociodemographic characteristics: age (15–29, 30–39, 40–49, 50–59, 60+), gender, race (white vs other) and highest level of education achieved (<12 years, 12 years (high school), 13+ years); smoking-related characteristics (level of nicotine dependence (smoke first cigarette within 30 min of awakening vs later)²⁹ and cigarettes per day (<10, 10–19, 20–29, ≥ 30)) and type of cigarette smoked (“light/ultralight”, regular). Recent quitters reported the type of cigarette smoked in the year before quitting. Smokers who indicated “no usual type” or “some other type” of cigarette were excluded. Smokers indicated if they had made a “serious” quit attempt or a quit attempt for at least 24 h in the prior year (yes/no). Smokers were defined as having recently quit smoking if they reported they had not been smoking for ≥ 90 days at the time of the 2003 survey. The smoking relapse curve flattens after 90 days,³⁰ and short-term success has been shown to predict long-term success.³¹

Statistical analysis

We first used descriptive statistics to characterise the overall sample and compare non-switchers with switchers, by reasons for switching (table 1). We further assessed differences among the reasons for switching by each covariate. We assessed the percentage of switchers (overall and by various reasons) versus non-switchers who (1) made a quit attempt (among all smokers, n = 30 800) and (2) achieved recent quitting (among those who made a quit attempt, n = 13 848) (table 2). Net quitting, expressed as a percentage, was the proportion of all 30 800

individuals who achieved recent quitting. To determine whether switching was independently associated with outcomes, we fitted separate multivariable logistic regression models in which the dependent variables were (1) making a quit attempt in the past year ($n = 30\,800$), (2) recent quitting (among those who made a quit attempt, $n = 13\,848$) and (3) net quitting ($n = 30\,800$). We ran each of these models with the independent variable as (1) ever-switching (yes/no) and (2) all eight possible combinations of reasons for switching.

All analyses used SUDAAN software (V. 10; RTI International, Research Triangle Park, North Carolina, USA) to obtain variance estimates using a balanced repeated replication method that accounted for the complex sampling design.^{27 28 32} Results were weighted to reflect the US population.

Results

The full sample of 30 800 (table 1) was almost half male and was predominantly white. Over half the sample reported smoking “light/ultralight” cigarettes (currently for current smokers, or in the year prior to quitting for recently quit smokers). There were 12 009 switchers (38%). Compared to non-switchers, switchers tended to be older, female, white, more educated and were more likely to smoke the first cigarette within 30 min of waking. Switchers were notably more likely than non-switchers to smoke “light/ultralight” cigarettes (either at the time of survey for current smokers, or in the year prior to quitting for recently quit smokers).

The most commonly reported reason for switching was flavour (26%), followed by a triad of reasons (harm reduction, quitting smoking and flavour) (18%), followed by the combination of harm reduction and flavour (15%). Among switchers, 41% cited a single reason, whereas 51% cited more than one reason (and 8% cited “none of these reasons”). Counting multiple reasons, 43% cited wanting to quit smoking, 51% cited harm reduction and 67% cited milder flavour as a reason for switching (totals add to over 100% because multiple reasons were cited).

Those who switched solely to quit smoking tended to be younger minority women with lower education and less dependence, while those who switched solely for harm reduction tended to be older, white, more highly educated males who smoked heavily. Smokers who had switched solely for flavour tended to be younger white males or females who smoked “light/ultralight” cigarettes. Those who switched for the combined reasons of quitting smoking and harm reduction tended to be middle aged, more educated males and those who switched for quitting smoking and flavour appeared to be younger, less educated females. Individuals who switched for combined harm reduction and flavour tended to be older, more highly dependent white men and women who smoked “light/ultralight” cigarettes. Those who switched for a combination of all three reasons tended to be evenly divided among age and gender categories and were more likely to be smoking “light/ultralight” cigarettes (all p values for differences among reasons for switching by covariates in table 1 <0.001).

Table 2 displays the analyses of quit attempts, recent quitting (≥ 90 -day abstinence at survey) and net quitting by reason for switching. Compared to non-switchers, switchers were more likely to make a quit attempt in the past year (51% vs 41%), but, once they made an attempt, were less likely to have recently quit (9% vs 17%). After adjustment for all covariates in table 1, the odds of switchers making a quit attempt were 58% higher than those of non-switchers. However, switchers who made a quit attempt had a 60% lower odds of recently quitting smoking, compared to non-switchers.

Quit attempts and recent quitting are also shown by reason for switching. The percentage who attempted quitting among individuals who switched for any reason that included “to quit smoking” was higher than among non-switchers, regardless of other reasons cited. After adjustment for all variables in table 1, the odds of making a quit attempt among those who

switched solely to quit smoking were 3.6 times greater than odds among non-switchers. Of those who switched solely to quit smoking, 71% made a quit attempt, compared to only 41% of non-switchers. There was no association between switching for harm reduction or flavour and making a quit attempt.

Among those who made a quit attempt, lower rates of achieving recent quitting were seen for switchers (all reasons except harm reduction). Whereas 17% of non-switchers who made a quit attempt recently quit smoking, only 9% of those who had switched for any reason recently quit. This difference held after adjusting for cofactors (adjusted odds ratio (AOR) 0.40, 95% confidence interval (CI) 0.35 to 0.45). Further, recent quitting varied by reason for switching: 6% of switchers who switched solely to quit smoking and 10% of switchers who switched solely for flavour, recently quit. After adjustment for important cofactors, odds of recent quitting among those who switched solely to quit smoking were 70% below those of non-switchers, and among those who switched solely for flavour, odds were 57% below those of non-switchers. The combination of quitting smoking and flavour was associated with 80% lower odds of recent quitting compared to non-switchers. There was no association between switching for harm reduction and recent quitting.

Thus, switching was generally associated with an increased likelihood of making a quit attempt, but a decreased likelihood of recently quitting smoking. How do these two opposing effects affect the net impact of switching on the likelihood of becoming a former smoker? Net quitting (table 2) was the percentage of all past-year smokers who recently quit (≥ 90 -day abstinence at the time of survey). Overall, 51% of all switchers made a quit attempt, but only 9% of this group achieved recent quitting, for a net 4% who quit smoking. In contrast, among non-switchers, 41% attempted quitting and 17% of those succeeded, such that 7% of all non-switchers quit smoking. The adjusted odds of net quitting were 46% lower among switchers (for any reason) compared to non-switchers, and tended to be even lower for those who had switched for the combination of quitting smoking and flavour. Thus, switching was associated with lower net quitting that varied by reason for switching.

Discussion

In this large, nationally representative sample of US adolescent and adult smokers, switching to a “lighter” cigarette for any reason was associated with 58% higher odds of making a quit attempt, but was also associated with 60% lower odds of achieving recent quitting in such an attempt. Our findings confirm and extend the findings from prior literature^{16 24 25} by delineating outcomes based on reasons for switching and by assessing net quitting (the product of making a quit attempt and recently quitting). Smokers who had switched for the purpose of quitting smoking (regardless of additional reasons) were the most likely to make a quit attempt, but also the least likely to have recently quit, with similar results for those who switched for any reason that included flavour. The net public health outcome associated with ever-switching was negative for all reasons except harm reduction, which appeared to be neutral.

Why would switching be associated with higher odds of making a quit attempt? The smokers who switched may have been the most motivated to change their smoking, whether by switching or by quitting. The Tobacco Use Supplement does not provide respondent data on their interest in quitting at the time they switched or at the time they made a quit attempt, so these data cannot address this hypothesis.

Given that some switchers may have been more interested in quitting, why were they less successful at quitting? As a result of switching, these smokers may have changed their smoking topography, possibly making smoking behaviour harder to change.³³ This potential scenario suggests that having switched might actually undermine successful quitting. It is also possible

that smokers who had the most trouble quitting preferentially switched: the smokers who wanted to quit and could, did so; the ones who could not sought an alternative, and switched. On this hypothesis, switching is not exercising a causal influence on cessation, but simply acting as a marker for smokers who were and are motivated to make a quit attempt and maintain abstinence, but who have trouble doing so. It is also possible that switchers began that process as highly motivated individuals who were able to attempt quitting, but whose motivation waned as they (falsely) came to see the “lighter” cigarette as less toxic and thus an acceptable alternative to outright cessation. It remains unclear why individuals who switched for harm reduction seemed less susceptible to these processes.

It is particularly concerning that smokers who switched as a means to quit smoking had the highest rates of quit attempts but also the lowest odds of recent quitting (57% to 80% lower than odds among non-switchers, depending on reasons for switching).

A lesser gap in odds of successful smoking cessation was seen for those who switched solely for better flavour (57% lower than the non-switchers). Of the 38% of smokers who reported switching (representing about 15 million US smokers), over a quarter cited doing so solely for flavour. Prior research suggests that smokers interpret descriptors such as “light” as an implicit indicator of reduced toxicity.³⁴ Cigarette companies may further be exploiting this association with newer descriptors such as “smooth” and “fine”.³⁵ Indeed, Philip Morris test marketed its purported reduced delivery Marlboro cigarettes under the name “Ultra Smooth”.

Thus smokers who switched for reasons that included flavour may have been diverted from making a quit attempt and quitting smoking by the daily reassurance from this sensory experience that their smoking was doing less damage to their health. In this sense, the apparent distinction between switching for flavour and switching for harm reduction begins to blur. However, smokers who switched only for flavour were about as likely as those who switched solely for harm reduction to make a quit attempt, but were less likely to have recently quit, suggesting that these motives reflect different dynamics.

Switching solely to smoke a less harmful cigarette did not appear to be associated with a change in odds of making a quit attempt or recent quitting: smokers who stated they switched for harm reduction were just as likely as non-switchers to attempt quitting and just as likely to succeed when they tried. This finding is in line with some prior research,^{24 25} but in contrast to other studies^{16 19–21} demonstrating less successful quitting among individuals who switched to lighter cigarettes for harm reduction. The survey question on switching asked in the current study differs slightly from most prior surveys, which asked only about switching for harm reduction,¹⁹ potentially leading to misclassification of reasons for switching.

If indeed smokers who switch in order to reduce their health risk are not thereby deterred from making quit attempts, or undermined in quitting success, then some of the concerns that have been expressed³⁶ about the unintended consequences of introducing “safer” cigarettes might be misplaced. However, this study is not capable of definitively answering this question, which requires further study.

Our study suggests that switching for various reasons has a complex relationship to quitting, sometimes being associated with higher likelihood of making quit attempts, even while being associated with lower rates of success in those attempts. Overarching that complexity is the finding that, for most smokers, switching is associated with lower chances of abstinence and overall lower rates of smoking cessation.

Our study has several important strengths. The 2003 Tobacco Use Supplement is a large, nationally representative sample of US smokers, featuring a clear, two-part question on switching that assessed reasons for switching and ensured that the act of switching was not

trivial or short lived. The methods of probing reasons for switching allowed for multiple combinations and showed that smokers tend to switch for combinations of reasons. This may have important implications when counselling smokers, including openly discussing people's intended reasons for switching and the potential consequences for smoking cessation.

The Tobacco Use Supplement lacked complete data on attitudes and beliefs toward “lighter” cigarettes (these questions were only asked of current, but not of former smokers). Finally, the design of the study, which lacked precise information on timing of switching, precludes definitive interpretation of the relationship between switching and subsequent smoking cessation as causal. It is even possible that the experience of quitting could have altered the participants' recall of reasons for switching. This study shares this limitation of retrospective data with almost all the studies on “lights”. The one study to prospectively examine switching and subsequent quitting was in turn limited by small sample size, constraining its ability to address the impact of switching on quitting.²⁴

In conclusion, compared to non-switchers, switchers were more likely to make a quit attempt between 2002 and 2003, but were less likely to have recently quit smoking during this period. The magnitude of this association varied by reason for switching. Our analyses support the position that switching should be discouraged and that switching as a step towards quitting should be particularly discouraged. As neither “light” cigarettes nor any other kind of cigarettes have demonstrated convincing clinical evidence of reduced harm, smokers should be encouraged to stop smoking, rather than just change what cigarettes they smoke.

What this paper adds

- This large cross-sectional study of the US Tobacco Use Supplement to the Current Population Survey demonstrates that smokers who have switched to a “lighter” cigarette in the past (as compared to non-switchers) have 46% lower odds of being smoke free at the time of the survey.
- The survey uniquely captured reasons for switching to “lighter” cigarettes; switching for reasons that included quitting smoking was associated with the lowest odds of being smoke free when surveyed.

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References

1. US Federal Trade Commission. Federal Trade Commission cigarette report for 2004 and 2005. Washington, DC, USA: Federal Trade Commission; 2007.
2. Borland R, Yong HH, King B, et al. Use of and beliefs about light cigarettes in four countries: findings from the International Tobacco Control Policy Evaluation Survey. *Nicotine Tob Res* 2004;6(Suppl 3):S311–21. [PubMed: 15799594]

3. Kozlowski LT, Dreschel NA, Stellman SD, et al. An extremely compensatable cigarette by design: documentary evidence on industry awareness and reactions to the Barclay filter design cheating the tar testing system. *Tob Control* 2005;14:64–70. [PubMed: 15735303]
4. Pollay RW, Dewhirst T. The dark side of marketing seemingly “light” cigarettes: successful images and failed fact. *Tob Control* 2002;11(Suppl 1):I18–31. [PubMed: 11893811]
5. National Cancer Institute. The FTC cigarette test method for determining tar, nicotine, and carbon monoxide yields of US cigarettes. Bethesda, Maryland, USA: National Cancer Institute; 1996. National Cancer Institute smoking and tobacco control monograph no. 7, NIH publication no. 96-4028
6. Burns, DM., editor. Risks associated with smoking cigarettes with low machine-measured yields of tar and nicotine. Bethesda, Maryland, USA: National Cancer Institute; 2001. Smoking lower yield cigarettes and disease risks; p. 65-158. National Cancer Institute smoking and tobacco control monograph no. 13
7. Benowitz NL, Hall SM, Herning RI, et al. Smokers of low-yield cigarettes do not consume less nicotine. *N Engl J Med* 1983;309:139–42. [PubMed: 6866013]
8. Djordjevic MV, Stellman SD, Zang E. Doses of nicotine and lung carcinogens delivered to cigarette smokers. *J Natl Cancer Inst* 2000;92:106–11. [PubMed: 10639511]
9. Hecht SS, Murphy SE, Carmella SG, et al. Similar uptake of lung carcinogens by smokers of regular, light, and ultralight cigarettes. *Cancer Epidemiol Biomarkers Prev* 2005;14:693–8. [PubMed: 15767351]
10. Jarvis MJ, Boreham R, Primatesta P, et al. Nicotine yield from machine-smoked cigarettes and nicotine intakes in smokers: evidence from a representative population survey. *J Natl Cancer Inst* 2001;93:134–8. [PubMed: 11208883]
11. Harris JE, Thun MJ, Mondul AM, et al. Cigarette tar yields in relation to mortality from lung cancer in the cancer prevention study II prospective cohort, 1982-8. *BMJ* 2004;328:72. [PubMed: 14715602]
12. Samet, J. The changing cigarette and disease risk: current status of the evidence. Bethesda, Maryland, USA: National Institutes of Health, National Cancer Institute; 1996.
13. Thun MJ, Burns DM. Health impact of “reduced yield” cigarettes: a critical assessment of the epidemiological evidence. *Tob Control* 2001;10(Suppl 1):i4–11. [PubMed: 11740038]
14. Cataldo JK, Malone RE. False promises: the tobacco industry, “low tar” cigarettes, and older smokers. *J Am Geriatr Soc* 2008;56:1716–23. [PubMed: 18691279]
15. Borland R, Fong GT, Yong HH, et al. What happened to smokers' beliefs about light cigarettes when “light/mild” brand descriptors were banned in the UK? Findings from the International Tobacco Control (ITC) Four Country Survey *Tob Control* 2008;17:256–62.
16. Haddock CK, Lando H, Klesges RC, et al. Modified tobacco use and lifestyle change in risk-reducing beliefs about smoking. *Am J Prevent Med* 2004;27:35–41.
17. Smith SY, Curbow B, Stillman FA. Harm perception of nicotine products in college freshmen. *Nicotine Tob Res* 2007;9:977–82. [PubMed: 17763115]
18. World Health Organization. WHO Framework Convention on Tobacco Control. Geneva, Switzerland: WHO; 2003. Article 11: Packaging and labelling of tobacco products; p. 9-10.
19. Giovino, G. The FTC cigarette test method for determining tar, nicotine, and carbon monoxide yields of US cigarettes. Bethesda, Maryland, USA: National Cancer Institute; 1996. Attitudes, knowledge, and beliefs about low-yield cigarettes among adolescents and adults; p. 39-57. National Cancer Institute smoking and tobacco control monograph no. 7, NIH publication no. 96-4028
20. Siegel M, Nelson DE, Peddicord JP, et al. The extent of cigarette brand and company switching: results from the Adult Use-of-Tobacco Survey. *Am J Prevent Med* 1996;12:14–6.
21. Tindle H, et al. Cessation among smokers of “light” cigarettes: results from the 2000 National Health Interview Survey. *Am J Pub Health* 2006;96:1498–504. [PubMed: 16809583]
22. Kessler, G.; U.S. v. Philip Morris Inc.. et al. Civil Action No. 99-2496 (GK). U.S. District Court for the District of Columbia; Sep 29. 2000 U.S. Plaintiff v. Philip Morris Inc.. Defendants, Civil Action No. 99-2496 (GK). Washington, DC, USA: US District Court for the District of Columbia; Sep 28. 2000 2000
23. Lautenberg, F. Lautenberg, Snowe bill to prohibit false and deceptive cigarette labeling passes key senate committee. Newark, New Jersey, USA: Senator F Lautenberg's Press Office; 2008.

24. Hyland A, Hughes JR, Farrelly M, et al. Switching to lower tar cigarettes does not increase or decrease the likelihood of future quit attempts or cessation. *Nicotine Tob Res* 2003;5:665. [PubMed: 14577983]
25. Haddock CK, Talcott GW, Klesges RC, et al. An examination of cigarette brand switching to reduce health risks. *Ann Behav Med* 1999;21:128–34. [PubMed: 10499133]
26. Gilpin EA, Emery S, White MM, et al. Does tobacco industry marketing of ‘light’ cigarettes give smokers a rationale for postponing quitting? *Nicotine Tob Res* 2002;4(Suppl 2):S147–55. [PubMed: 12573176]
27. US Census Bureau. Census Bureau technical paper 66: design and methodology. Oct2006 [27 September 2009]. <http://www.census.gov/apsd/techdoc/cps/cps-main.html>
28. Hartman, AM., et al. The 2003 Tobacco Use Special Cessation Supplement to the Current Population Survey (TUS-CPS): representative survey findings. [27 September 2009]. <http://riskfactor.cancer.gov/studies/tus-cps/results/data03/>
29. Fagerstrom K. Time to first cigarette; the best single indicator of tobacco dependence? *Monaldi Arch Chest Dis* 2003;59:91–4. [PubMed: 14533289]
30. Hughes JR, Keely J, Naud S. Shape of the relapse curve and long-term abstinence among untreated smokers. *Addiction* 2004;99:29–38. [PubMed: 14678060]
31. Gilpin EA, Pierce JP, Farkas AJ. Duration of smoking abstinence and success in quitting. *J Natl Cancer Inst* 1997;89:572–6. [PubMed: 9106646]
32. LaVange LM, Stearns SC, Lafata JE, et al. Innovative strategies using SUDAAN for analysis of health surveys with complex samples. *Stat Methods Med Res* 1996;5:311–29. [PubMed: 8931198]
33. Benowitz, NL. Risks associated with smoking cigarettes with low machine-measured yields of tar and nicotine. Bethesda, Maryland, USA: National Cancer Institute; 2001. Compensatory smoking of low-yield cigarettes; p. 39-63. National Cancer Institutex smoking and tobacco control monograph no. 13
34. Shiffman S, Pillitteri J, Burton S, et al. Smokers' beliefs about “light” and “ultra light” cigarettes. *Tob Control* 2001;10(Suppl 1):i17–23. [PubMed: 11740040]
35. King B, Borland R. What was “light” and “mild” is now “smooth” and “fine”: new labelling of Australian cigarettes. *Tob Control* 2005;14:214–5. [PubMed: 15923475]
36. Shiffman S, Gitchell JG, Warner KE, et al. Tobacco harm reduction: Conceptual structure and nomenclature for analysis and research. *Nicotine Tob Res* 2002;4(Suppl_2):S113–29. [PubMed: 12573173]

Table 1
 Characteristics of ever-smokers who ever switched to a “lighter” cigarette by reason for switching (n = 30 800)^{*†‡}

Characteristic	Full sample (n = 30 800)	Did not switch [‡] (n = 18 791) (%)	Switched for any reason [‡] (n = 12 009) (%)	Switched to quit smoking only [‡] (n = 821) (%)	Switched for harm reduction only [‡] (n = 934) (%)	Switched for flavour only [‡] (n = 3180) (%)	Switched to quit smoking and for harm reduction [‡] (n = 1236) (%)	Switched to quit smoking and for flavour [‡] (n = 900) (%)	Switched for harm reduction and for flavour [‡] (n = 1768) (%)	Switched for all three reasons [‡] (n = 2174) (%)	Switched for other reason(s) [‡] (n = 996) (%)
Age:											
15–29	22	29	25	37	16	29	23	35	15	20	29
30–39	21	21	18	26	16	20	17	23	14	17	17
40–49	26	24	26	21	27	24	29	24	29	27	24
50–59	18	15	19	12	25	16	21	12	24	20	18
60+	14	11	13	5	17	12	10	6	18	15	12
Gender:											
Male	48	55	50	47	56	49	53	46	49	49	54
Female	52	45	50	53	44	51	47	54	51	51	46
Race:											
White	86	82	88	83	92	90	86	86	90	84	88
Other	14	18	12	17	8	10	14	14	10	16	12
Education:											
≤12 years	18	21	17	19	13	15	16	17	16	18	22
High school	40	40	38	39	36	39	32	40	37	39	43
>High school	41	38	45	42	51	46	51	43	47	44	36
Time to first cigarette:											
≤30 min	56	53	57	54	60	58	58	46	62	54	62
>30 min	44	47	43	46	40	42	42	54	38	46	38
Cigarettes smoked per day:											
<10	23	27	19	23	15	18	22	25	15	23	17
10–19	30	29	31	34	29	30	31	38	28	31	28
20–29	35	33	36	33	38	38	35	29	40	35	38
≥30	12	11	14	10	19	14	12	8	17	11	17
Type of cigarette most often smoked: [§]	56	43	75	55	69	85	56	79	86	80	58

Characteristic	Full sample (n = 30 800)	Did not switch [‡] (n = 18 791) (%)	Switched for any reason [‡] (n = 12 009) (%)	Switched to quit smoking only [‡] (n = 821) (%)	Switched for harm reduction only [‡] (n = 934) (%)	Switched for flavour only [‡] (n = 3180) (%)	Switched to quit smoking and for harm reduction [‡] (n = 1236) (%)	Switched to quit smoking and for flavour [‡] (n = 900) (%)	Switched for harm reduction and for flavour [‡] (n = 1768) (%)	Switched for all three reasons [‡] (n = 2174) (%)	Switched for other reason(s) [‡] (n = 996) (%)
Light/ultra-light Regular	44	57	25	45	31	15	44	21	14	20	42

* 30 800 is the total sample; 18 791 is the number of people who did not switch to a “lighter” cigarette; 12 009 is the number of people who switched for any reason to a “lighter” cigarette and serves as the denominator for columns 4–11 (ie, reasons for switching among those who switched);

[‡] percentages shown are by column: columns 4–11 (reasons for switching) are subcategories of column 3 (switching for any reason);

[‡] p values <0.001 for differences between switchers (for any reason) (vs non-switchers) and among reasons for switching for all covariates;

[§] type of cigarette most often smoked was asked of current smokers and recently quit smokers (absincent for ≥90 days at the time of survey); recently quit smokers indicated the type of cigarette they most often smoked in the year prior to quitting smoking.

Table 2

Quit attempts, recent quitting and net quitting by reason for switching to a “lighter” cigarette^{*†}

	Made a quit attempt between 2002– 2003 (n = 30 800)			Recent quitting (≥90 day abstinence when surveyed among those who made a quit attempt) (n = 13 484)			Net quitting (% of all smokers who recently quit) (n = 30 800)			
	Percentage of cases (n = 30 800)	%	Adjusted odds ratio	%	Adjusted odds ratio	%	Adjusted odds ratio	%	Adjusted odds ratio	
Overall switching:	61	41	Reference	17	Reference	7	Reference	–	Reference	
Did not switch* (reference group for all analyses)										
Switched	39	51	0.001	1.58 (1.48 to 1.69)	9	<0.001	0.40 (0.35 to 0.45)	4	<0.001	0.54 (0.47 to 0.61)
Reason for switching (among the 12 009 who switched):										
Sole reasons:										
Quit smoking	7	71	<0.001	3.60 (3.00 to 4.32)	6	<0.001	0.30 (0.20 to 0.45)	4	0.016	0.54 (0.36 to 0.83)
Harm reduction	8	40	0.699	1.09 (0.91 to 1.31)	18	0.680	0.97 (0.69 to 1.35)	7	0.801	0.99 (0.71 to 1.37)
Flavour	26	40	0.476	0.95 (0.85 to 1.06)	10	<0.001	0.43 (0.34 to 0.54)	4	<0.001	0.45 (0.36 to 0.57)
Multiple reasons:										
Quit smoking and harm reduction	10	66	<0.001	3.04 (2.61 to 3.54)	9	<0.001	0.43 (0.32 to 0.58)	6	0.148	0.78 (0.58 to 1.04)
Quit smoking and flavour	8	68	<0.001	2.78 (2.29 to 3.38)	5	<0.001	0.20 (0.12 to 0.33)	3	0.004	0.34 (0.21 to 0.55)
Harm reduction and flavour	15	36	0.002	0.88 (0.78 to 1.11)	9	<0.001	0.42 (0.31 to 0.58)	3	<0.001	0.41 (0.30 to 0.56)
Quit smoking and harm reduction and flavour	18	64	<0.001	2.66 (2.40 to 2.95)	7	<0.001	0.31 (0.24 to 0.40)	4	0.001	0.52 (0.40 to 0.68)
Other reason(s)	8	39	0.378	1.03 (0.89 to 1.19)	11	0.004	0.53 (0.37 to 0.76)	4	<0.001	0.58 (0.41 to 0.82)

* Non-switchers are the reference group for all analyses;

† adjusted odds ratio (adjusted for age, race, gender, education, time to first cigarette, cigarettes per day, type of cigarette smoked regularly).