

## Brief Report

# Characteristics of smoker support for increasing a dedicated tobacco tax: National survey data from New Zealand

Nick Wilson, Deepa Weerasekera, Richard Edwards, George Thomson, Miranda Devlin, & Heather Gifford

## Abstract

**Aim:** To examine smoker support for tobacco tax and for increased dedicated tobacco taxes, along with associations for any such support.

**Methods:** The New Zealand (NZ) arm of the International Tobacco Control Policy Evaluation Survey utilizes the NZ Health Survey (a national sample). From this sample, we surveyed adult smokers ( $N = 1,376$ ).

**Results:** Most smokers considered that the current level of tobacco tax is "too high" (68%), but a majority (59%) would support an increase in tobacco tax if the extra revenue was used to promote healthy lifestyles and support quitting. There was majority support for a dedicated tobacco tax increase among all sociodemographic groups of smokers (including Māori, Pacific, and Asian smokers). In the fully adjusted multivariate model, significant associations with support for a dedicated tax increase included higher deprivation level (adjusted odds ratio [AOR] = 1.15) and suffering one form of financial stress (AOR = 1.81, 95% CI = 1.18–2.78). Other significant associations with support included concern about the smoking impacts on health and quality of life (AOR = 1.41), expressing support for tobacco control regulation (AOR = 1.83), and strength of intention to quit (AOR = 1.30).

**Discussion:** A majority of smokers from all sociodemographic groups supported an increase in tobacco tax if it was dedicated to quitting support and health promotion. The higher support among smokers with stronger intentions to quit is consistent with other evidence that smokers value tobacco control regulation such as high taxes to help them achieve their long-term quitting goals.

## Introduction

Tobacco tax is one of the most important tobacco control interventions (Jha & Chaloupka, 1999), and an additional benefit is

that it can generate revenue for funding tobacco control programs. There are at least 10 countries and at least 9 states in the United States with dedicated tobacco taxes (Campaign for Tobacco-Free Kids, 2008; Thomson, 2007). Yet, the literature concerning public and smoker attitudes to *dedicated* tobacco taxes is fairly sparse. In a Massachusetts study, the support for an increase in tobacco tax that was dedicated (earmarked) was far higher than if the tax revenue was to be used for any government purpose (81% vs. 31%; Hamilton, Biener, & Rodger, 2005). This pattern was also described elsewhere in the United States, for example, Oregon (Centers for Disease Control and Prevention [CDC], 1997).

In this study, we aimed to study smoker support for current and dedicated tobacco taxes in New Zealand (NZ) and to undertake the most detailed multivariate analysis to date (i.e., considering a wide range of variables: sociodemographic, smoking-related behaviors, and beliefs). Our study population (NZ smokers) allowed us to explore attitudes in a culturally diverse population for which there are good data on deprivation levels and in a setting where the tobacco tax levels are relatively high, at 69% of the total cost per pack (i.e., giving a retail price of over \$NZ10/\$US6 for a pack of 20 cigarettes; Mackay, Eriksen, & Shafey, 2009; Wilson, Thomson, & Edwards, 2008, 2009).

## Methods

### The International Tobacco Control Policy Evaluation Survey

The International Tobacco Control Policy Evaluation Survey (ITC Project) is a multicountry study on tobacco use epidemiology and tobacco control policy evaluation. A full description of the ITC Project conceptual framework and methods has been published elsewhere (Fong et al., 2006; Thompson et al., 2006). The NZ arm of the ITC Project survey differs somewhat in that

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**Table 1. Attitudes of smokers to the current level of tobacco tax in New Zealand and toward an increase in tobacco tax if it was a dedicated tax for funding health promotion and quitting support (all results weighted and adjusted for the complex design)**

Variable	Current tax			Increased tax (if dedicated)		
	Tax too high (%)	Tax not too high (%) <sup>a</sup>	Crude OR for saying tax is too high (95% CI)	Support increase (%)	Don't support increase (%)	Crude OR for support (95% CI)
Total (N = 1,376)	68.0	32.0	—	59.0	41.0	—
Age group (years) <sup>b</sup>						
18–24 (n = 147)	56.5	43.5	1.00 (Referent)	56.7	43.3	1.00 (Referent)
25–34 (n = 339)	68.5	31.5	1.67 (0.96–2.90)	63.9	36.1	1.35 (0.79–2.32)
35–44 (n = 353)	69.7	30.3	1.77 (1.04–3.01)	60.1	39.9	1.15 (0.68–1.95)
45–54 (n = 292)	70.5	29.5	1.84 (1.06–3.17)	56.6	43.4	0.99 (0.58–1.71)
55+ (n = 245)	73.1	26.9	2.09 (1.18–3.69)	55.4	44.6	0.95 (0.55–1.63)
Gender						
Men (n = 529)	67.4	32.6	1.00 (Referent)	59.7	40.3	1.00 (Referent)
Women (n = 847)	68.5	31.5	1.05 (0.77–1.43)	58.2	41.8	0.94 (0.71–1.25)
Ethnicity <sup>c</sup>						
European (n = 620)	69.7	30.3	1.00 (Referent)	55.4	44.6	1.00 (Referent)
Māori (n = 607)	63.3	36.7	0.75 (0.55–1.02)	64.6	35.4	1.47 (1.09–1.98)
Pacific (n = 90)	64.1	35.9	0.77 (0.42–1.42)	66.4	33.6	1.59 (0.89–2.86)
Asian (n = 59)	72.7	27.3	1.16 (0.48–2.78)	71.0	29.0	1.97 (0.95–4.10)
Small-area deprivation level (quintiles) <sup>d</sup>						
1 and 2 (least deprived; n = 121)	51.6	48.4	1.00 (Referent)	58.0	42.0	1.00 (Referent)
3 and 4 (n = 205)	67.6	32.4	1.96 (1.08–3.55)	50.9	49.1	0.75 (0.42–1.34)
5 and 6 (n = 238)	70.3	29.7	2.22 (1.22–4.04)	56.7	43.3	0.95 (0.54–1.68)
7 and 8 (n = 308)	73.5	26.5	2.60 (1.48–4.59)	59.1	40.9	1.05 (0.61–1.81)
9 and 10 (most deprived; n = 504)	68.6	31.4	2.04 (1.20–3.49)	65.4	34.6	1.37 (0.82–2.31)
Financial stress <sup>e</sup>						
Unable to pay any important bills on time—“yes” (n = 113; referent = “no”)	63.8	36.2	0.82 (0.44–1.51)	73.7	26.3	2.05 (1.11–3.81)
Not spending on household essentials—“yes” (n = 374; referent = “no”)	68.9	31.1	1.07 (0.75–1.52)	73.2	26.8	2.32 (1.62–3.30)

Notes: OR = odds ratios.

<sup>a</sup>Includes the responses that the tobacco tax was “it is just right,” “it is a bit too low,” “it is far too low.”

<sup>b</sup>Based on New Zealand Health Survey data with the age data collected a few months prior to the International Tobacco Control Policy Evaluation Survey.

<sup>c</sup>Ethnicity results are for prioritized ethnicity where all those with Māori, or both Māori and other ethnic affiliations, were classified as Māori; where all those with Pacific, or both Pacific and other ethnic affiliations, were classified as Pacific (unless Māori affiliation was also reported), and so on (for more details, see an online *Methods Report* [Wilson, 2009]). The European grouping includes other (non-Māori, non-Pacific, and non-Asian) ethnic groups.

<sup>d</sup>Deprivation level was based on a New Zealand-specific index (NZDep2006; Wilson, 2009).

<sup>e</sup>We considered two measures of financial stress which are correlated with each other (and the small-area deprivation measure; Wilson, 2009) but involve significant conceptual differences (Siahpush, Borland, & Yong, 2007; Siahpush, Yong, Borland, Reid, & Hammond, 2009). The first question was “... because of a shortage of money, were you unable to pay any important bills on time, such as electricity, telephone, or rent bills?” The second question was “In the last 6 months, have you spent money on cigarettes that you knew would be better spent on household essentials like food?” For more details, see an online *Methods Report* (Wilson, 2009).

the smokers involved are from the sample frame of New Zealand Health Survey (NZHS) participants. Respondents were selected by a complex sample design, which included systematic boosted sampling of the Māori, Pacific, and Asian populations. Interviews were conducted face-to-face in respondents' homes by trained interviewers (on contract to the Ministry of Health) and resulted in a total of 11,924 interviews with respondents aged 18 years and older. The overall response rate was 67.9%. Other

issues around the NZHS response rate as it relates to the ITC Project are detailed in an online *Methods Report* (Wilson, 2009).

## Participants

From the NZHS sample, we had an additional sampling frame of adult smokers who were aged 18 years and older and who were willing to participate in further research when asked this at the

end of the NZHS interview (this was 85.2% of the adult smokers in the NZHS). Of 2,438 potential respondents who met these criteria, a total of 1,376 completed a telephone questionnaire, giving a response rate of 56.4%. But if this response rate is considered in terms of the NZHS and willingness to further participate, then the overall response rate is reduced further to 32.6% [see an online *Methods Report* (Wilson, 2009) for more details].

## Procedures

Surveying of these participants was carried out using a computer-assisted telephone survey between March 2007 and February 2008, usually 3–4 months after their NZHS interview. The study protocol was cleared by the Multi-Region Ethics Committee in NZ (MEC/06/07/071) and by the Office of Research Ethics, University of Waterloo, Waterloo, Canada (ORE #13547).

## Measures

The first question asked about tobacco tax was “What do you think about the amount of tax on tobacco products?” (with five response options including: “it is far too high,” “it is a bit too high,” “it is just right,” “it is a bit too low,” “it is far too low,” and “can’t say”). The next question asked was “Would you support an increase in the tax on tobacco if all the extra money was used to promote healthy lifestyles, including helping smokers wanting to quit?” (with “yes” and “no” response options). Some sociodemographic questions were asked in the NZHS, but most of the smoking behavior and smoking-related belief questions were from the Wave 4 four-country ITC survey.

## Weighting and statistical analyses

Weighting of the results was necessary given the sampling design (e.g., boosted sampling of three ethnic groups in the NZHS) and nonresponse for the NZHS and ITC Project survey. A full description of the weighting process is detailed in an online report (Clark, 2008).

Univariate analysis of all socioeconomic and smoking variables was initially conducted, and we also carried out a multivariate logistic regression analysis. The latter used a conceptual framework, which assumed that there would be hierarchical relationships between demographic and sociodemographic factors (Victora, Huttly, Fuchs, & Olinto, 1997), that would dominate over smoking-related beliefs, intentions, and behaviors. All models included age, gender, and ethnicity, and Models 2–3 included key sociodemographic variables [i.e., small-area deprivation using a NZ-specific index (NZDep2006; Wilson, 2009)]. For Model 3, we entered variables relating to smoking beliefs, intentions, and behavior if these variables had a  $p$  value of  $<0.05$  in the univariate analyses. A forward selection procedure was used to select the final version of this fully adjusted model. All analyses were conducted in Stata (version 10; StataCorp, College Station, TX), and all the presented results were weighted and adjusted for the complex sample design of the NZHS to make the sample representative of all NZ smokers.

## Results

### Attitude to the current level of tax

Most respondents considered that the current level of tobacco tax was “too high” (68.0%), with 19.9% saying it was “just right”

and 5.7% saying it was “too low.” The proportion believing that tax was “too high” increased significantly with increasing age and with increasing level of small-area deprivation (Table 1).

### Attitude to an increased tax (if dedicated)

A majority of the respondents (59.0%) would support an increase in tobacco tax “if all the extra money was used to promote healthy lifestyles, including helping smokers wanting to quit” (Table 1). Majority support was seen for all sociodemographic groups and was significantly higher for Māori (compared with European/Other smokers). Those reporting two different measures of financial stress were also more supportive (Table 1).

### Attitudes by smoking behavior

Support for a dedicated tax increase was statistically significantly higher among nondaily smokers versus daily smokers (82.3% vs. 56.7%), among the lowest volume smokers (in terms of cigarettes per day among daily smokers), and in terms of intention to quit (e.g., odds ratio [OR] = 4.89, 95% CI = 2.76–8.65 for intention to quit “within the next month” at 78.1%, vs. “not planning to quit” at 42.2%). Those supporting an increase also had a significantly lower “heaviness of smoking” index score compared with those who did not support an increase (mean scores of 0.86 vs. 1.28, respectively,  $p < .05$ ).

### Attitudes by smoking beliefs

Support for a dedicated tax increase was significantly greater among supporters of advertising restrictions on tobacco (OR = 2.14), those believing that tobacco products should be more tightly regulated (OR = 2.81), and those believing that government should do more to tackle the harm done by smoking (OR = 3.31, 95% CI = 2.46–4.45). Supporters of a tax increase also had significantly higher “awareness of smoking harm” scores (7-item scale), higher scores for “smoking has affected health and quality of life” (2-item scale), and for “concern that smoking will lower health and quality of life in the future” (2-item scale; with all results:  $p < .001$ ).

Those less supportive of an increase were significantly more likely to believe that “smoking is no more risky than lots of other things people do” (OR for support = 0.48), to have higher mean scores for having self-exempting beliefs (3.22 vs. 2.82,  $p < .001$ , using a 3-item scale), to perceive themselves as being “at least somewhat addicted” (OR = 0.62), and to view smoking as being more positive overall (mean scores of 3.60 vs. 3.04,  $p < .001$ , 5-point scale).

### Independent associations between smoker characteristics and support for increased dedicated tax

The probability of being a supporter was higher for Māori and Pacific peoples in the model considering just demographic variables (Model 1, Table 2). The additional sociodemographic variables that were significantly associated with support were the small-area deprivation measure (Model 3) and one of the two measures of financial stress (both Models 2 and 3).

The beliefs and intentions that were significantly associated with support in the fully adjusted model (Model 3) were (a) having a favorable belief in regulation for tobacco control,

**Table 2. Logistic regression analyses on support by smokers for increased tobacco tax (if dedicated; all results weighted and adjusted for complex sample design)**

Variables	AOR (95% CI)		
	Model 1 (demographics)	Model 2 (+ sociodemographics) <sup>a</sup>	Model 3 (+ smoking beliefs, intentions, and behavior) <sup>a</sup>
<b>Demographic</b>			
Age (35–49 vs. <35 years)	0.84 (0.65–1.09)	1.01 (0.71–1.43)	1.30 (0.86–1.96)
Age (50+ vs. <35 years)	0.85 (0.64–1.14)	0.90 (0.61–1.32)	1.27 (0.79–2.03)
Gender (women vs. men)	1.02 (0.81–1.29)	0.93 (0.69–1.26)	0.98 (0.68–1.41)
Māori vs. European	1.68 (1.32–2.13)	1.31 (0.95–1.80)	1.39 (0.95–2.02)
Pacific vs. European	1.63 (1.02–2.61)	1.23 (0.64–2.37)	0.71 (0.26–1.92)
Asian vs. European	1.46 (0.84–2.57)	1.45 (0.69–3.08)	1.28 (0.50–3.26)
<b>Sociodemographic</b>			
Small-area deprivation quintiles (increasing deprivation)	—	1.07 (0.95–1.19)	1.15 (1.01–1.32)
Financial stress: not spending on household essentials	—	2.14 (1.49–3.05)	1.81 (1.18–2.78)
<b>Smoking beliefs, intentions, and behavior</b>			
Self-exempting beliefs (3-item index) <sup>b</sup> (Cronbach's $\alpha = 0.60$ )	—	—	0.69 (0.54–0.87)
Concern regarding smoking impact on health and quality of life in the future (2-item index) <sup>c</sup> ( $\alpha = 0.78$ , item correlation = 0.63)	—	—	1.41 (1.13–1.75)
Attitude to regulation (2-item index) <sup>b</sup> ( $\alpha = 0.51$ , item correlation = 0.34)	—	—	1.83 (1.46–2.30)
Strength of intention of quitting (4-point scale) <sup>b</sup>	—	—	1.30 (1.06–1.60)
Heaviness of smoking index (alternate version) <sup>d</sup>	—	—	0.93 (0.86–1.01)

Notes: AOR = adjusted odds ratio.

<sup>a</sup>The AORs in Models 2 and 3 are adjusted for the demographic and key sociodemographic variables (i.e., deprivation) and Model 3 for smoking-related beliefs, intentions, and behavior variables. The included variables from the univariate analyses that became nonstatistically significant in the models (at  $p < .05$ ) were subsequently omitted from the final respective models, except for those considered critical to our conceptual framework (see Methods section).

<sup>b</sup>For additional details see an online *Methods Report* (Wilson, 2009).

<sup>c</sup>The “concern around smoking impact” scale was based on the following two questions: (a) “How worried are you, if at all, that smoking WILL damage YOUR health in the future?” and (b) “How worried are you, if at all, that smoking WILL lower your quality of life in the future?” For both these questions the response options were “Not at all worried,” “A little worried,” “Moderately worried,” “Very worried,” “Refused,” “Can’t Say.”

<sup>d</sup>The “Heaviness of Smoking Index” has been developed by others, and we used the “alternative version” utilized by others (Borland et al., 2004). This is calculated as the square root of the daily cigarette consumption minus the natural logarithm of time to first cigarette of the day. The specific equations are detailed in an online *Methods Report* (Wilson, 2009).

(b) concern around the impact of smoking on future health and quality of life, and (c) strength of intention to quit. In contrast, having self-exempting beliefs was associated with having less support.

## Discussion

### Main findings and interpretation

Overall, this study found that most smokers thought that current levels of tobacco taxation are too high. However, there was overall majority support for tobacco tax increases provided additional revenue generated was dedicated to promoting healthy lifestyles and supporting quitting. This majority support was seen in all sociodemographic groups of smokers. Higher support for dedicated tax increases was expressed among those with greater concerns about smoking impacts and higher quitting intentions. This overall finding for greater support for dedicated tobacco tax is consistent with findings for various states in the United States (CDC, 1997; Hamilton et al., 2005) but may be the first such finding for outside of North America.

The majority support for a dedicated tax increase may be suggestive that many smokers in this setting are not emphasizing short-term concern about high tobacco prices (i.e., as per standard economic theory and previous evidence of smoker preferences for cheaper tobacco [Green & Gerken, 1989]). Indeed, the findings are more consistent with the “imperfectly rational addiction model” or “irrational addiction model” (Sloan & Wang, 2008) in which smokers tend to have time-inconsistent preferences and hence may value higher taxes as a self-control device. Such an interpretation is further supported by other data from this study population on the desire of most smokers to quit and on making previous quit attempts (i.e., 69% and 58%, respectively, Bullen et al., 2009). The association between smoker support for increased dedicated taxes and for increased government action on tobacco (along with more tobacco product regulation) is also consistent with this theory around self-control support. However, it could also reflect beliefs that the dedicated tax revenue will be used for enhancing smoking cessation services, which will make quitting less expensive and more likely to be successful.

After adjusting for all variables (Model 3), there was greater support for a dedicated tax increase among more deprived smokers and among those reporting one form of financial stress. But this was no longer the case for Māori and Pacific smokers, who are both relatively deprived groups in NZ. Comparable data from other countries are largely lacking, although a Massachusetts study (Hamilton et al., 2005) reported higher support for a dedicated tax among “racial/ethnic minorities.”

## Study limitations

This study involved a sample which (due to nonparticipation in the NZHS and then in the Wave 1 ITC Project survey) could have become less representative of the national population of smokers. It is therefore possible that the weighting process (although relatively sophisticated) may not have fully adjusted for these processes. Nevertheless, the finding that there was support for increased (dedicated) tobacco taxes among all the different sociodemographic groups is reassuring, along with the fact that the sample retained reasonable numbers of the most deprived smokers. As this analysis was only based on the first survey wave, we have not been able to ascertain the directionality of smoker responses, for example, how changes in sociodemographic status (such as increased poverty) are related to changes in support for a dedicated tax.

Given that this study just dealt with one jurisdiction where tobacco tax was relatively high, it is desirable that this type of study be repeated in a range of jurisdictions. Also, the survey was limited to asking only one question concerning use of the tax revenue, so future work could cover a wider range of issues. These could better differentiate attitudes to current tax levels versus tax increases and explore attitudes for a wider range of uses of the tax revenue, for example, including for cancer research and treatment services.

## Policy implications

As regards current levels of tobacco tax, it seems desirable for governments to frame this tax entirely as a key health protecting and tobacco control intervention (as argued previously [Wilson & Thomson, 2005a]). But the results of this study suggest that such framing will be much more likely to appear genuine to smokers if it is accompanied by moves to make the tax revenue dedicated to health promotion activities and to smoking cessation support. In culturally diverse settings such as NZ, this can include funding support for culturally appropriate quitting campaigns (e.g., for Māori [Grigg, Waa, & Bradbrook, 2008; Wilson, Grigg, Graham, & Cameron, 2005]) and cessation services (e.g., the Aukati Kai Paipa services for Māori women [Business Research Center, 2003]). Dedicating tobacco taxes to health promotion may also strengthen the ethical justification for such taxes (Wilson & Thomson, 2005b).

In summary, the results of this study indicate that a majority of smokers (including from all different ethnic groups and all deprivation quintiles) support tobacco tax increases if these are dedicated. The higher support among smokers with stronger intentions to quit is consistent with other evidence that smokers value tobacco control regulation such as high taxes, to help them achieve their long-term quitting goals. Therefore, these findings may facilitate improved support for such tax increases by a wider range of health workers and policy makers.

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## Declaration of interests

None declared.

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