

Tax as a motivating factor to make a quit attempt from smoking: a study before and after the April 2010 tax increase

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ABSTRACT

INTRODUCTION: Increasing excise tax on tobacco is one of the most powerful and cost-effective smoking interventions. Despite this evidence, there has been no substantial tax increase in New Zealand between 2000 and 2010. In April 2010 a 10% tax increase on factory-made cigarettes and a 24% tax increase on loose leaf tobacco was implemented.

AIM: To evaluate the effect of cost as a motivating reason for smokers to make a quit attempt before and after the 2010 tobacco tax increase.

METHODS: A regression analysis of a cross-sectional study was conducted. Data were collected from August to October 2009 and compared with data collected in July 2010.

RESULTS: In 2009, 25.5% of smokers cited cost as a reason for trying to quit smoking compared with 55.6% in 2010. The adjusted odds of making a quit attempt with cost as a reason were 3.6 (95% CI 2.3–5.6, $P = <0.001$). Furthermore, smokers were more likely to make a quit attempt in 2010 than in 2009. Thirty percent of smokers made at least one quit attempt in 2009 and 39% made a quit attempt in 2010 (adjusted odds ratio 1.5, 95% CI 0.95–2.3, $P = <0.1$).

DISCUSSION: The recent tax increase on tobacco in New Zealand has resulted in more smokers making an attempt to quit smoking and more smokers identifying cost as a motive for quitting.

KEYWORDS: Smoking; smoking cessation; tobacco; taxes; New Zealand

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Introduction

Increasing excise tax on cigarettes is one of the most powerful tobacco control interventions because it results in a reduction in smoking initiation in youths, an increase in quit attempts made by smokers and a reduction in consumption of cigarettes for young adult smokers.^{1–6} There is increasing evidence on the relationship between tax increases and cigarette consumption.^{7–13} A 10% increase in tax on tobacco has an estimated 5–8% reduction in smoking prevalence and this effect is even greater for young people, being more price sensitive than adult smokers.^{5,7,14} The increased revenue could potentially be used to maintain effective tobacco control measures, including

support for smokers who are quitting¹ or in other public health arenas. This makes raising excise tax the most cost-effective intervention in smoking cessation.^{15–24}

Common motivators for quitting smoking are personal health, cost, for someone else's benefit, and vanity.^{23,25} Motivation alone is not always adequate in remaining smoke free²³—the effect of a trigger such as an increase in cost or a health scare gives an immediate incentive to make a quit attempt.²⁵

Quit attempts are a valuable measure for smoking cessation and are in line with the NZ Govern-

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ment and Ministry of Health targets.²⁴ Increased quit attempts raises the likelihood of permanently quitting smoking. Cost was explored as a motivator and trigger as it was the only policy change at the time of the study.

This research aimed to study the proportion of smokers who cite cost as a motivating reason to quit smoking since the excise tax increase in April 2010 of 10% on cigarettes and 25% on Roll-Your-Own (RYO) tobacco in New Zealand.

Methods

The method of the study is a regression analysis of a cross-sectional study. Three cross-sectional telephone surveys were conducted by Utting Mills Research (UMR) before the tax increase in 2009 and one cross section was taken after the tax increase in July 2010. This design enabled us to compare self-reported quit attempts and reasons for quitting smoking since the April tax increases on tobacco. The Association of Market Research Organisations (AMRO) New Zealand set out the professional and ethical regulations by which the UMR marketing company abides. Ethical approval was not required because we were provided with anonymous collated data from the UMR Group which obtains ethical approval from AMRO Marketing Research.

Sampling

Cross-sectional samples were obtained from the UMR omnibus telephone survey for the months August, September, October 2009 and for July 2010. The UMR omnibus telephone survey is conducted on a fortnightly schedule and captures a nationally representative sample of New Zealanders over the age of 18 years. This sample included smokers and non-smokers and the survey was organised into 23 telephone directory regions. The number of people over 18 years was determined by cross-referencing with the 2006 Census data from Statistics New Zealand. Quotas were specified accordingly so that an exact number of participants fell into each of the 23 regions. Up to five callbacks were made to reduce the impact of non-response on the representative sample. A random sample of telephone numbers were generated from Telecom's White Pages. A

representative sample of 750 New Zealanders were selected from the respondents from each fortnightly survey.

Variables

Smokers were survey respondents who reported that they smoked more than one cigarette per day. Number of quit attempts were assessed by asking smokers: "In the last three months, how many times did you make a serious effort to quit? By serious I mean you decided that you would try to make sure you never smoked again." There were seven response options which ranged from none up to more than 10 times. For analysis in this report, two categories were compared: none and one or more quit attempts. Motive or reason for quitting was determined by asking: "what was your reason for trying to quit?" and participants were allowed to report up to three reasons. For analysis, cost was prioritised as a reason to quit as it was the main focus; however, the three top reasons were also included for comparison.

Personal income was recorded and the responses were collapsed into low, middle and high income. Low income was no income to NZ\$30 000 per annum, middle income was defined as NZ\$30 001 to \$50 000 per annum and high income was over NZ\$50 000 per annum. Non-response was coded as missing data. Ethnicities were noted and from one to three ethnicities per respondent were recorded. Ethnicity was prioritised for Maori and was made up of either non-Maori or Maori. Non-Maori ethnicities were combined both for clarity and to compare with Maori as Maori have the highest smoking rates in New Zealand.² Age was ordered into five groups based on similar characteristics of an age group. Participants had to be at least 18 years of age. Non-response was coded as missing data. The months of August, September and October 2009 were compared with July 2010. This provided a comparison of before the April 2010 tax increase and after.

Method of analysis

Analysis was done using the Stata IC 10 2010 computer programme. Data checks and statistics

were undertaken for all variables. Two multiple logistic regression models were used to investigate if a correlation between the variables existed. The first model included all daily smokers and whether or not a quit attempt was made as the outcome variable. Ethnicity, gender, age group, year and income were included as explanatory variables. The second model only included daily smokers who reported making a quit attempt. The outcome was citing cost as a reason for quitting and ethnicity, gender, year, income and age were included as explanatory variables.

Results

Response rates

Response rates for the survey varied from 25% to 35% (Table 1). There were 627 daily smokers in 2009 and 115 daily smokers in 2010 (Table 2).

Quit attempts and reasons to quit smoking

The results show that a higher percentage of smokers made a quit attempt in the 2010 compared with 2009. In 2009, for the combined three surveys, 190 (30.3%) smokers made at least one serious quit attempt in the previous three months and, in 2010—which consisted of one survey only—45 (39%) smokers made a serious quit attempt. The adjusted odds of making a quit attempt in 2010 compared with 2009 was 1.5 (95% CI 0.95–2.3, $p=0.08$). This was adjusted for ethnicity, gender, age and income.

Compared with 2009, cost was more likely to be cited as a reason for quitting smoking in 2010 after the tax increased (Table 3). In 2009, 25% of smokers who made a quit attempt cited cost as a motivating factor compared with 55% in 2010. The adjusted odds ratio of cost being cited as a reason in 2009 compared with 2010 was 3.6 (95% CI 2.3–5.6, $p<0.001$).

Low income earners were significantly more likely to report cost as a reason for making a quit attempt. Seventeen percent of low income earners reported cost as a reason to quit smoking compared to only six percent of high income earners. In 2009, 20% of Maori smokers who made a quit attempt cited cost as the motivating factor to quit

WHAT GAP THIS FILLS

What we already know: Raising excise tax on tobacco is an effective smoking intervention tool that is both cost-effective and powerful—it results in a substantial number of smokers quitting smoking, has no government costs and in fact increases the revenue from smoking to in part compensate for the vast sums spent on smoking-related morbidity and mortality. Quit attempts are a good measure of smoking cessation as an increase in quit attempts relates to an increase in the likelihood of smoking cessation.

What this study adds: This study indicates that the recent tax increase on tobacco in New Zealand resulted in more smokers making an attempt to quit smoking and more smokers identifying cost as a motive for quitting.

Table 1. Response rate

Survey (month)	Call attempts	Response rate n (%)
August 09		
1st call	25 426	8136 (32)
2nd call	26 902	7264 (27)
September 09		
1st call	23 501	7520 (32)
2nd call	23 422	7729 (33)
October 09		
1st call	27 258	8995 (33)
2nd call	20 749	7262 (35)
July 10		
1st call	31 212	7803 (25)

Phone calls were made on a fortnightly basis for each month except for July 2010.

Table 2. Recruitment and sample characteristics

Demographics	2009 n (%)	2010 n (%)
Sample size	4500 (85.7)	750 (14.3)
Male	2154 (47.9)	359 (47.9)
Female	2346 (52.1)	391 (52.1)
Maori	410 (9.1)	86 (11.5)
Non-Maori	4090 (90.9)	664 (88.5)
18–24 years	283 (6.29)	43 (5.7)
25–34 years	736 (16.4)	134 (17.9)
35–49 years	1649 (36.6)	267 (35.6)
50–59 years	686 (15.2)	129 (17.2)
60 and older	1146 (25.5)	177 (23.6)
Smoker	627 (13.9)	115 (15.3)

Table 3. Logistic regression outcome variable: Cost as a reason to quit smoking, comparing the variables of ethnicity, gender, year, income and age

Variable	Total (%) Smokers who made quit attempt	n (%) who cited cost as reason	Crude analysis OR (95% CI)	Crude analysis p value	Adjusted analysis OR (95% CI)	Adjusted Analysis p value
Year						
2009	190 (30.3)	48 (25.5)	1.0 (reference)	–	1.0 (reference)	–
2010	45 (39)	25 (55.6)	4.0 (2.6–6.0)	<0.001	3.6 (2.3–5.6)	<0.001
Ethnicity						
Non-Maori	185	61 (32.3)	1.0 (reference)	–	1.0 (reference)	–
Maori	50	12 (24)	1.8 (1.0–3.2)	0.036	1.5 (0.9–2.8)	0.12
Gender						
Male	101	29 (28.7)	1.0 (reference)	–	1.0 (reference)	–
Female	134	44 (32.8)	1.3	0.26	1.9 (0.6–1.4)	0.7
Income						
Low <\$30 000	96	16 (16.7)	1.0 (reference)	–	1.0 (reference)	–
Middle \$30 000–\$50 000	70	6 (8.6)	0.7 (0.4–1.1)	0.104	0.6 (0.3–1.0)	0.05
High >\$50 000	51	3 (5.6)	0.4 (0.2–0.6)	0.001	0.3 (0.2–0.6)	<0.001
Age						
18–24	22	2 (9.1)	1.0 (reference)	–	1.0 (reference)	–
25–34	57	10 (17.5)	1.6 (0.7–4.0)	0.3	1.9 (0.8–4.9)	0.7
35–49	94	7 (7.4)	0.9 (0.4–2.4)	0.9	1.3 (0.5–3.2)	0.6
50–59	30	2 (6.7)	1.0 (0.4–2.6)	1.0	1.2 (0.5–3.4)	0.7
60+	32	7 (21.9)	0.6 (0.2–1.6)	0.3	0.8 (0.3–2.0)	0.6

smoking and, in 2010, 36.4% of Maori cited cost as a motivating factor.

Discussion

These results show that a higher number of smokers who had not already quit in the previous three months made an attempt to quit smoking in 2010 compared with 2009. Additionally, in 2010 cost was more than twice as likely to be a motivating factor to quit smoking compared with 2009.

Quit attempts are a valuable measure of smoking status because they are associated with decreased tobacco consumption, increased time to first cigarette and decreased overall dependency of tobacco. In one study the number of quit attempts increased as the number of cigarettes decreased.^{26,27} Quit attempts are augmented by

advocacy, health promotion and unequivocal, widely comprehended warnings about the damaging effects of smoking playing an important role in relapse prevention.^{16–18,28,29}

Other reasons given for making a quit attempt were for personal health, for someone else's health, because a doctor/nurse recommended it and due to advertising. The New Zealand Government's strategy to reduce smoking states that increasing quit attempts is an important measure in smoking cessation.²⁴ Increased quit attempts as found in this study in conjunction with cost as a trigger show that not only are smokers still price sensitive, but also that they will make more attempts to quit smoking in response to a tax increase.

The results of this survey are consistent with another New Zealand evaluation of the tax

increase.³⁰ The number of Quitline calls after the April 2010 tax increase was double the number of calls in the previous year. Cost was cited as the second most common reason after health for quitting with 31% of their callers giving cost as the main reason for quitting smoking since the tax increase.³⁰

The effect of the tax increase was the focus for this paper because it was the sole policy change in New Zealand for this period. In 2007, New Zealand was ranked as having the third highest tax rate in English-speaking countries following the UK and Ireland.⁹ In another study, conducted in 2005, New Zealand was ranked 16th in tobacco tax and seventh in tobacco affordability, based on the amount of hours worked in order to buy a packet of cigarettes.²⁶ This was prior to the latest tax increase which would place New Zealand even further up the rank of high tobacco tax. Prior to the increase there had been no tax increase on tobacco in New Zealand for the last decade. Price sensitivity is lowest in developed (4% compared with 8% price elasticity) countries where the price of cigarettes is higher and count for a greater share of the retail price than in developing countries where the absolute price is lower.^{31–34} However, as is demonstrated by this study, the effect of a tax increase remains statistically significant, even in a developed country such as New Zealand.

There are a number of issues which arise when tax is increased which need to be addressed in order to have the desired effect of reducing smoking prevalence. Aside from cessation and reduced consumption, various strategies may be used by smokers to avoid financial burden. These strategies include switching to RYO tobacco as a cheaper alternative to tailor-made cigarettes,^{35–40} a common strategy used by New Zealand smokers.³⁹ Prior to the 2010 tax increases, RYO tobacco was significantly cheaper than tailor-made cigarettes due to RYO cigarettes being rolled with less than the usual 0.7 g of tobacco per cigarette.^{1,38,41} Consequently the rates of RYO tobacco smokers in New Zealand were higher than in other countries where the price of RYO tobacco is higher.^{39,41} The health risks are the same for RYO and tailor-made cigarettes.^{1,4}

The effect of tax increases specific to Maori showed a greater proportion of smokers made at least one quit attempt in 2010 compared with 2009. It is important that interventions work for all subgroups and preferably better for Maori in order to reduce inequalities.^{1,4}

Strengths and limitations

The low response rate means that the sample population may not be fully representative. Secondly, only smokers were used in this analysis so it did not include ex-smokers who may have quit smoking due to the tax increase. Also, as the results are self-reported, the data is reliant on respondents' honesty. Finally, as the survey was conducted within three months of the tax increase, long-term abstinence from smoking could not be evaluated in regard to the tax increase. The strength of the study is that it is a national sample and, despite the very low 2010 sample size, we still measured a significant difference in the number of quit attempts and motivation. It is likely that this study underestimates the short-term increase in quit attempts due to a tax increase.

Policy and research implications

This study demonstrates that raising tobacco tax is still a powerful and cost-effective measure and should continue as a future intervention to reduce tobacco consumption. It has also been acknowledged in other work that having a specific dedicated tax to help support smokers to quit is advisable.^{2,10} In order to work towards population equality, it is important that there is continuing research on the effect of each sequential tax increase. Secondly, a longitudinal study is required to establish whether cost as a motivating reason for quitting resulted in longer term abstinence from smoking.

Specific primary care implications

As an adjunct to the current primary health strategy on the smoking cessation, especially the 'A, B, C' strategy, raising tobacco tax is a supportive tool in smoking cessation. Secondly, having support tailored specifically for Maori and people of low socioeconomic status may be important because these groups have higher smoking rates.

Conclusion

Since the tax rise in April 2010, cost has become highly significant as a quit instigator and motivator in New Zealand. This demonstrates that increasing tax is a powerful tool which should be maximised in support of smoking cessation both for Maori and non-Maori.

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