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Public opinion regarding earmarked cigarette tax in Taiwan

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Abstract

Background: Cigarette taxation has been perceived by academics and policy-makers as one of the most effective ways of reducing the use of cigarettes. On January 1 2002, the Taiwan government imposed a New Taiwan (NT) $5 per pack tax earmarked for the purpose of tobacco control. This study uses a survey collected prior to taxation to assess public attitudes toward cigarette taxation, public beliefs about the effectiveness of cigarette taxation at reducing cigarette use and public opinions about the allocation of this tax revenue.

Methods: Data were drawn from a national face-to-face interview on cigarette consumption in 2000. A total of 3,279 adults were aged 18 to 64 years; 49.9% of whom were male and 50.1% female, and with a smoking prevalence of 49.1% and 4.1%, respectively. The attitudes toward cigarette tax were analysed using multi-logit regressions. We analysed by logistic regression the potential changes in smoking behaviour that smokers might make in response to the five NT (New Taiwan) dollar earmarked tax on cigarettes per pack. We summarized public opinions about the allocation of earmarked tax revenue using descriptive statistics.

Results: Current smokers (OR = 0.34) and former smokers (OR = 0.68) were less likely to support the cigarette tax than non-smokers. A favourable attitude toward the tax was positively associated with personal monthly income, especially among females. Among male smokers, the possibility of reducing/quitting smoking in response to the five-NT-dollar tax was negatively associated with the monthly expense for smoking. The two most frequently-suggested areas to receive money from the revenue collected from the earmarked tax were health education and cancer subsidy.

Conclusions: Smoking status and economic factors determine the attitude and potential responses of people toward the cigarette tax. Taiwan's five NT-dollar earmarked tax for cigarettes may have only a limited effect upon the reduction in cigarette use.

Background

Since the health risk of smoking became generally known following the release of the 1964 United States Surgeon General's report, anti-smoking campaigns and the institution of smoking-related policies have become common worldwide. Many studies have found that one of the most effective methods of reducing the use of cigarettes is to raise cigarette prices by imposing additional taxes [1-7]. Since 1980, such taxes have been imposed by countries such as Finland, Denmark, Egypt, Canada, Nepal, Iceland,

Peru, Australia, and New Zealand [8]. Hsieh, Hu and Lin (1999) have noted that Taiwan has a higher price elasticity of demand for cigarettes (-0.6) [9] than some high-income countries (elasticity around -0.4) [10], which might suggest that the effect of increased taxes in eliciting a reduction in public smoking should be more significant in Taiwan.

From a policy point of view, cigarette taxation is one of the most widely used "sin taxes." Governments can discourage the consumption of cigarettes by imposing taxes on cigarettes. It is also believed that such taxation would help pay for the external cost imposed upon the rest of the society by smokers. There are other policy reasons to tax cigarettes. Many policy makers in other countries or states have used part of the revenue generated from this sin tax to support anti-smoking activities. For instance, the 1988 California Tobacco Tax and Health Promotion Act (Proposition 99) explicitly specified the use of tax revenue for health-education programs for the prevention and reduction of cigarette use, indigent health care, research, and other activities [11]. In Victoria, Australia, a 5% tax was levied on the sale of tobacco products in 1986 to finance health promotion [8]. Egypt and Nepal have used such additional tax revenues for health-related activities such as paying for low-income maternal and child health care or subsidizing medical expenditures for low-income families [8].

On March 28, 1999, the Taiwan government passed the Tobacco and Alcohol Tax Act, which was implemented on the January 1 of 2002 when Taiwan entered the World Trade Organization (WTO). In that Act, Article 22 specifies an additional earmarked tax of five NT dollars per pack of twenty cigarettes. In 2000, the government further specified that 70% of this earmarked tax would go to national health insurance, ten percent to anti-tobacco activities, ten percent to health promotion and disease prevention, and ten percent to welfare. Before January 1, 2002, Taiwan's domestic cigarettes were supplied by a government-run manufacturer – the Taiwan Tobacco and Wine Bureau. Both domestic and imported cigarettes were subject to an *in-kind* tax, called ***monopolistic profit***, which constituted nearly 47% of retail price [8]. After entering WTO, Taiwan's market became more liberalized, the monopoly was privatized and given a new name, the Taiwan Tobacco and Wine Board, and a new tax scheme for tobacco product was implemented. Under the new tax scheme, outlined in the Tobacco and Alcohol Tax Act, each pack of domestic cigarettes would be subject to two tobacco-related taxes in addition to business revenue tax and tariff (for foreign cigarettes): a NT$11.8 tobacco tax and a NT$5 earmarked tax for tobacco control.

As new anti-smoking policies are being throughout the world, evaluating the impact of such policies upon cigarette use and public acceptance of control policies is becoming increasingly important. Direct studies of public opinion might provide valuable information for future legislation and policy-making. There are few such studies, however. Because they directly influence tobacco-related legislation, the attitudes of legislators toward tobacco-control policies are often studied [12-14]. Not so often studied, however, is public support of anti-smoking policies. Early public support studies have shown smoking status, gender and income to be related to support for tobacco-control policies [15-17]. In a California study, Green and Gerken (1989) reported that smokers were significantly more negative to restrictions placed upon public smoking and tobacco sales-tax increases than non-smokers, which was also noted in 1991 by Dixon et al. in a replication and extension of Green and Gerken's earlier study. Green and Gerken (1989) also reported that the relationship between income differences and support for higher tobacco sales taxes was considered trivial for non-smokers, but strong for smokers [18,19].

In Taiwan, although the public is well aware of the cigarette tax imposed, little is known about their support of the tax and their opinions on how the revenue generated by the earmarked cigarette tax should be utilized. Recently, the government is considering adding another NT $3 earmarked tax upon current NT $5. This article aims to provide information regarding 1) public attitude toward the earmarked cigarette tax, 2) the expected effect of the NT$5 earmarked tax on cigarette use and 3) public opinion on the allocation of the tax revenue.

Methods

Data Collection

The data used in this study were drawn from a three-stage random-sampled face-to-face interview survey on cigarette consumption in 107 townships and two metropolitan areas in Taiwan during 2000. This survey, conducted entirely by the Division of Health Policy Research at the National Health Research Institutes, covered the civilian, non-institutionalised population aged 12 years or older. The response rate for this survey was 55%. The main analyses were restricted to the 3,279 adults who, at the time of interview, were 18 years of age or above.

Measures

Participants were first classified into three groups: never-smokers, former smokers and current smokers. Respondents were asked, "Have you smoked at least one cigarette in your entire life?" Those responding "no" were classified as never-smokers; those responding "yes" were classified as ever-smokers. Ever-smokers were asked, "In the past month, have you smoked everyday, some of the days, or

not at all?" Respondents who answered "every day" or "some of the days" were classified as current smokers; those who answered "not at all" were considered former smokers. The attitude of all respondents toward cigarette taxation was ascertained by asking whether they agreed, disagreed or chose to make no comment regarding the imposition of the earmarked cigarette tax (purportedly) aimed at reducing the consumption of cigarettes. Another independent variable was perceived effective tax, which we obtained by asking the respondents how much tax they thought would be necessary to reduce the use of cigarettes should the government decide to impose a cigarette tax for that purpose. Because 26.6% of the 3,279 adults surveyed (49.1% of male smokers) did not report the amount of tax per pack which they thought would be effective in reducing smoking behaviour, we classified this variable into three levels: zero for missing value, one for equal to or less than five NT dollars, and two for a tax greater than five NT dollars. They were also asked how they thought the revenues from such taxes should be allocated. Current smokers were asked, if the government imposed the earmarked cigarette tax, whether they would quit smoking, reduce smoking amount, switch to cigarettes with a lower level of nicotine, or continue their current smoking behaviour. Current smokers were also asked questions on the amount of money they spent monthly on cigarettes.

Data Analysis

Chi-square tests of association were conducted to determine differences among the three smoking groups. Multinomial logit regression was used to ascertain predictors of the attitude toward the earmarked cigarette tax among all adults and then within each combination of gender and smoking status (i.e., smokers and non-smokers). Due to the small number of female smokers, this subgroup was not considered separately. The subgroups who favored or opposed the imposed tax were each compared with the reference group, those who expressed no opinion on this issue. Logistic regression was used to determine predictors of a reduction in smoking among current smokers. This analysis was conducted on the cohort of male smokers only, due to the paucity of female smokers in the sample; the dependent variable was an indicator for whether or not the smoker anticipated decreasing or quitting smoking as a result of the imposed tax. To determine the influence of the tax on smokers of different economic means, two additional logistic models were considered: one for each of the subgroups formed by splitting the sample according to a monthly income of NT $ 40K. All regressions included the independent variables of gender, age, education, living area, marital status, employment status and monthly income; the monthly tobacco expenses measure was included in the analyses on the sub-sample of current smokers only. A simple descriptive analysis was performed to summarize public opinion among all respondents on how the revenue raised from the five NT dollar tax should be allocated.

Results

Table 1 shows the characteristics of the study. Of 3,279 adults surveyed, 26.6% were current smokers, and 6.6% former smokers. Current and former smokers were likely to be male and older than 35 years of age. Current smokers were less likely to have graduated from undergraduate or graduate schools than those who had never smoked. Former smokers were more likely to be married than current smokers. Both current and former smokers were more likely to be currently employed and have monthly incomes greater than NT $40,000. The relationships of smoking status to age, education, marital status, employment status, and monthly income were similar within the male-only subgroup.

With regard to attitude toward cigarette taxation, of all adults surveyed, 53.3% supported the taxation, 20.4% objected to it, and 26.3% offered no comment. In fact, of the 833 non-smoking males, 63.3% supported cigarette taxation and 10.8% expressed disagreement with it; on the other hand, of the 803 male smokers, 28.3% supported the tax while 46.1% objected, a striking contrast between the smoking status groups (data not shown in the table). The first column in Table 2 reveals the percentage of the respondents who supported the tax with respect to socio-demographic, economic and smoking characteristics. Sixty percent of the women surveyed and 46.1% of the male respondents favoured the tax. That rate of support decreased with an increase in age, but increased with an increase in employment status, education and income. A higher support rate for the earmarked taxation was also observed for smokers who spent less than NT $500 per month on smoking than those who spent a greater amount.

Predictors of attitudes toward the earmarked cigarette tax

In the multilogit regression analysis for all adults (shown in the second column of table 2), current smokers were found to be less likely to support the policy of cigarette taxation (OR = 0.34, $p < 0.05$) and more likely to oppose it (OR = 3.57, $p < 0.05$). A supportive attitude toward the tax was positively associated with higher education levels (OR = 1.47 to 3.51; $p < 0.05$). Married adults were 1.32 times more likely to favour the tax than unmarried adults. A supportive attitude toward the tax was also related to a higher monthly income (OR = 1.81 to 2.49, $p < 0.05$). However, when analysed according to whether the respondent was male or female and whether the respondent was a smoking male or not, most of these estimates turned out to be quite different. The analysis for female attitudes toward cigarette tax was similar to the analysis

Table 1: Characteristics of 3279 adult participants, aged 18 years or older, by smoking status

Characteristics	All adults (n = 3279)				Male adults (n = 1636)			
	Never-smokers (n = 2193)	Former smokers (n = 215)	Current smokers (n = 871)	P value *	Never-smokers (n = 639)	Former smokers (n = 194)	Current smokers (n = 803)	P value *
Male	29.1	90.2	92.2	<0.0001				
Age								
18–24	15.0	4.2	11.1	<0.0001	20.8	4.6	10.8	<0.0001
25–34	25.4	17.7	28.1		25.4	14.4	27.9	
35–44	27.0	39.5	34.0		25.7	39.7	34.3	
45–54	18.4	17.2	15.7		16.9	18.6	15.9	
≧ 55	14.3	21.4	11.0		11.3	22.7	11.1	
Education								
Preliminary or lower	25.0	19.1	18.5	<0.0001	16.6	20.1	18.1	<0.0001
Junior high school	12.5	16.3	24.6		10.8	17.5	24.5	
Higher school	30.0	32.1	36.2		28.5	28.9	36.6	
Undergraduate or graduate	32.5	32.6	20.7		44.1	33.5	20.7	
Missing	0.0	0.0	0.1		0.0	0.0	0.1	
Living area								
Northern area	41.7	48.1	43.5	0.4392	39.7	47.2	42.0	0.4063
Central and eastern area	29.1	25.2	27.8		30.9	26.4	28.3	
Southern area	29.2	26.6	28.7		29.5	26.4	29.8	
Married	68.8	72.0	66.6	0.2547	58.0	73.2	67.4	<0.0001
Employed	64.8	83.3	81.3	<0.0001	76.2	83.5	83.7	<0.001
Monthly income								
<NT $10,000	34.2	17.2	18.6	<0.0001	21.7	17.0	16.6	<0.0001
NT $10,000–19,999	15.2	7.2	8.2		9.7	6.9	8.0	
NT $20,000–29,999	17.0	13.9	18.0		15.5	13.3	17.4	
NT $30,000–39,999	13.6	17.7	21.7		18.7	17.0	22.9	
≧ NT $40,000	20.0	44.0	33.5		34.4	45.7	35.1	

* the P-value of chi-square test

for all adults, but the attitudes of males varied considerably according to their smoking status.

The attitudes of non-smoking males toward the cigarette tax were associated with age. The older the non-smoking male, the less support for the tax, while more highly educated individual were more likely to support cigarette tax. Unlike female non-smokers, the attitude of male non-smokers was not associated with income. Our analysis of male smokers showed that their attitude toward the earmarked tax was associated with living area and monthly smoking expense. We found male smokers in the central and eastern areas to be less likely to oppose the earmarked tax. We also found that the more these smokers spent on smoking, the more likely it was for them to oppose the cigarette tax.

Predictors of changes in smoking behaviour

Of the male smokers, 22.3% reported that they would consider reducing or quitting smoking in response to the earmarked cigarette tax (Table 3). In general, the likelihood of a positive change in smoking behaviour decreased with an increase in monthly income as well as with an increase in monthly cigarette expenses (Table 3, the first column). Thirty-two percent of the group who believed a tax of NT$5 or less would effectively reduce smoking would consider reducing or quitting smoking in response to the proposed tax. This percentage figure was higher than the corresponding values noted for the other two groups.

The logistic regression revealed that the likelihood of a smoker's changing smoking behaviour was predicted by his view of the NT $5 tax as effective. Those who believed that this tax would be effective were 1.69 times more

Table 2: Attitude toward cigarette taxation and perceived effective amount of tax

	Attitude toward cigarette taxation								
	Percentage of support	Multi-logit regression							
	All adults (n = 3279)	All adults (n = 3279)		Male smokers (n = 803)		Male non-smokers (n = 833)		Female non-smokers (n = 1575)	
Characteristics	% Support	Favor OR	Oppose OR	Favor OR	Oppose OR	Favor OR	Oppose OR	Favor OR	Oppose OR
Smoking status									
Current smokers	27.4	0.34*	3.57*						
Former smokers	58.1	0.68*	1.33						
Ref: Never-smokers	63.1	1.00	1.00						
Female	60.4	1.09	0.89						
Ref: Male	46.1	1.00	1.00						
Age									
25–34	53.4	0.76	1.31	0.99	1.18	0.58	2.10	0.73	1.01
35–44	56.8	1.07	1.22	1.16	1.13	0.83	3.73*	1.06	0.60
45–54	52.3	0.96	1.00	0.94	0.73	0.45*	1.37	1.30	0.78
≧ 55	43.2	0.97	0.85	1.64	0.89	0.64	2.93	1.96	0.48
Ref: 18–24	57.3	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Education									
Junior high school	41.4	1.47*	1.02	1.07	0.85	2.23*	1.73	1.31	0.87
Higher school	52.7	2.02*	0.94	1.32	0.98	2.54*	1.11	2.17 *	0.73
Undergraduate or graduate	71.6	3.51*	0.84	1.77	0.77	4.82*	1.42	4.34 *	0.62
Ref: Preliminary school or lower	38.9	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Living area									
Central and eastern area	49.6	0.64*	0.65*	0.73	0.64*	0.49*	0.70	0.65 *	0.61 *
Southern area	48.8	0.88	1.14	1.30	1.32	0.71	0.84	0.85	1.09
Ref: Northern area	58.8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Married	53.5	1.32*	1.20	1.30	1.03	1.57	0.87	1.50 *	2.26 *
Ref: Unmarried	52.9	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Employed	54.7	0.88	1.05	1.59	1.45	0.90	2.27	0.78	0.92
Ref: Unemployed	50.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Monthly income									
NT $10,000–19,999	48.2	1.29	1.24	0.53	1.05	1.03	0.15*	1.64 *	1.73
NT $20,000–29,999	51.8	1.81*	1.40	0.66	0.87	2.53	0.84	2.06 *	1.70
NT $30,000–39,999	56.3	2.13*	1.04	0.66	0.57	2.38	0.43	2.94 *	1.95
≧ NT $40,000	64.1	2.49*	0.99	1.00	0.61	2.32	0.40	4.00 *	2.86 *
Ref: <NT $10,000	47.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Monthly expenditure on smoking #									
NT $500-999	26.6			0.92	1.53				
NT $1,000–1,999	22.2			0.74	1.72*				
≧ NT $2,000	27.9			1.59	3.35*				
Ref: < NT $500	33.5			1.00	1.00				

*$p < .05$, two-tailed test. # the monthly expenditure on smoking was only assessed among smokers.

likely to report they would attempt to either reduce consumption or quit smoking if they were taxed five NT dollars per pack ($p < 0.05$). This intention to reduce or quit, however, was found to be negatively associated with monthly expenses on smoking (OR = 0.34 to 0.61, $p < 0.05$). The more current smokers actually spent on smoking at time of survey, the less likely they would be to change their smoking behaviour in response to the earmarked tax. The logistic models based on the two income groups were quite different from each other. The model

Table 3: Perceived possibility of reducing or quitting smoking in response to the earmarked cigarette tax

	Possible quitting or reducing smoking in response to the earmarked cigarette tax among male smokers			
		Logistic regression		
	Male smokers (n = 803)	Male smokers (n = 803)	Monthly income less than NT $ 40K (n = 521)	Monthly income greater than NT $ 40K (n = 282)
Characteristics	% Change smoking behaviour	OR	OR	OR
Age				
25–34	21.3	1.06	1.10	0.97
35–44	24.4	1.27	1.30	1.08
45–54	17.6	0.69	0.80	0.47
≧ 55	23.3	0.68	0.72	-
Ref: 18–24	24.1	1.00	1.00	1.00
Education				
Junior high school	21.5	0.73	0.51	4.33
Higher school	20.7	0.69	0.59	2.51
Undergraduate or graduate	23.6	0.99	0.85	3.93
Ref: Preliminary school or lower	25.2	1.00	1.00	1.00
Living area				
Central and eastern area	25.3	1.38	1.64*	0.96
Southern area	24.2	1.14	1.31	1.00
Ref: Northern area	18.9	1.00	1.00	1.00
Married	21.6	0.96	0.77	2.55
Ref: Unmarried	23.9	1.00	1.00	1.00
Employed	22.3	1.70	1.52	-
Ref: Unemployed	22.3	1.00	1.00	1.00
Monthly income				
NT $10,000–19,999	34.5	1.10	1.13	-
NT $20,000-29,999	26.1	0.65	0.75	-
NT $30,000–39,999	19.9	0.46	0.56	-
≧ NT $40,000	17.8	0.38*	-	-
Ref: <NT $10,000	26.0	1.00	-	-
Monthly expenditure on smoking				
NT $500–999	22.2	0.59*	0.48*	1.18
NT $1,000–1999	21.3	0.61*	0.52*	0.99
≧ NT $2,000	13.3	0.34*	0.28*	0.64
Ref: < NT $500	31.6	1.00	1.00	1.00
Effective earmarked cigarette tax				
≤ NT $5	31.60	1.69*	2.00*	1.00
> NT $5	21.40	1.10	0.90	1.59
Ref: Missing	20.10	1.00	1.00	1.00

*$p < .05$, two-tailed test.

for the less financially well-off male smokers was similar to the entire cohort of male smokers, likely due to the fact that the sample of male smokers was dominated by those with income lower than NT $40K. Financially worse-off male smokers would be more likely to consider reducing or quitting smoking when they spent less on smoking and believed NT $5 earmarked tax was effective. For more financially well-off smokers, however, no factors were found to significantly determine potential changes in their smoking behaviour in response to the earmarked cigarette tax.

Allocation of earmarked cigarette tax revenue

Nearly sixty percent of the adults surveyed suggested that the revenues be used to promote health education and related areas, and 51.3% suggested that the tax be used to subsidize the medical costs for cancer. Only 10.0% of respondents suggested that such revenues be used to fund related research, and 16.7% to control smuggling.

Discussion

Our study reveals that a little more than half of the population in Taiwan (53.3%) expressed a favourable attitude toward the intended cigarette tax. The most influential variable affecting public opinion toward the earmarked cigarette tax was the individual's smoking status at time of the survey, which is consistent with previous studies [18,19]. This finding suggests that self-interest plays the dominant role influencing social attitudes toward cigarette-tax policies. Other influential determinants include education level, marital status and monthly income, but none of these factors could explain the male smokers' attitude toward a cigarette tax (purportedly) imposed to discourage smoking. Income level was found to be influential for females only with regard to respondents' attitude toward a cigarette tax. In general, our results shed some light upon the significance of socio-economic characteristics in determining the attitude toward tax policy.

Will the earmarked cigarette tax be able to alter smokers' behaviour? Our study shows that it might have a very limited effect. Only 22.3% of the male smokers claim they might consider reducing or quitting smoking in response to the tax. Moreover, the rates of potential changing smoking behaviour in response to the earmarked tax are quite different between smokers who are better-off financially than those who are less well-off: 17.7% versus 24.4% ($p < 0.05$). There were no significant predictors of intention to change smoking practice due to the introduction of a cigarette tax among financially better-off smokers. The possibility that the tax might have a limited effect on changing smoking practice is reflected in the financially less well-off smokers' beliefs regarding the effectiveness of the tax in encouraging a reduction in smoking. Smokers who believe that the tax would effectively influence a change in smoking behaviour would also consider changing their smoking behaviour, but those who do not believe this to be an effective measure would not. Moreover, those who already spend more on smoking are less likely to consider reducing or quitting smoking if taxed. Although many abstained from answering this question, the mean value for the "effective tax," which interviewees thought would constitute an effective tax, was NT $54.0 per pack, a figure much greater than the legislated tax amount of NT $11.80 cigarette tax and five NT dollar earmarked tax.

Unlike most studies of public opinion about public policies conducted prior to legislation or a public vote, our study does not serve any political purpose. It is one of the few existing cigarette-tax studies that bring public perspectives into consideration. On the other hand, it does provide the government with the knowledge that nearly half of the people interviewed oppose this tax policy as a means of reducing smoking behaviour. In fact, the rate of support for this tax policy is much lower than the support rate for other anti-smoking policies. For example, 91.4% of respondents supported strict smoking restrictions in public places, 91.2% supported banning adolescent (under 18 years old) smoking, and 89.8% favoured banning cigarette sales to adolescents. Reflecting upon our analysis of the potential for change in smoking behaviour, we also noted that people might not necessarily appreciate or respond to the imposition of some economic impetus to stop smoking. This suggests that people might consider reducing or quitting smoking perhaps for reasons other than the introduction of a smoking tax. For instance, of the 997 male smokers, 50.2% reported that they had tried to quit smoking with a success rate of 38.8%. Two dominant reasons for quitting smoking were poor current health (28.2%) and ensuring future (better) health (19.8%). By contrast, only few would appear to be likely to quit due to consideration of the high cost of cigarettes (4%).

One limitation of our study is the paucity of female smokers in the study sample. While this is no doubt due to differences in smoking rates between males and females in Taiwan, this may limit the generalizability of the interpretations made about the likelihood of smokers changing their smoking behaviour in reaction to increased tax, as female smokers may be motivated by different factors than males. Another limitation is related to the amount of missing data, particularly for the questions pertaining to opinion of the proposed tax (26.3% missing) and opinion on the amount of tax that would deter smoking (26.6% missing). While the respondents with missing data were categorized into a separate group in the analyses, they most likely represent a heterogeneous subset, as far as their actual opinions on these issues.

Nevertheless, the findings of our study provide policymakers with a consensus of public opinion and also puts cigarette taxation price into perspective, an important consideration regarding future taxation policy. Further studies should be done to determine the impact of the cigarette tax upon cigarette smoking, the potential problem of cigarette smuggling and the substitution of imported for domestic cigarettes due to possible profiteering from the fluctuation in cigarette prices. Finally, for more effective policy design and outcome, the countries considering reducing smoking by adding or raising cigarette tax

should start by better understanding their populations so that any future related legislation represents or matches a certain level of public opinion.

Conclusions

Our study reveals that a little more than half of the population in Taiwan (53.3%) expresses a favourable attitude toward the intended cigarette tax. The most influential variable affecting public opinion toward the earmarked cigarette tax was the individual's smoking status at time of the survey. Our study also shows that the earmarked tax might have a very limited effect on altering smokers' behaviour. In order to maximize the taxation effect on reducing smoking, policymakers have to efficiently allocate the tax revenue on alternative tobacco control strategies.

Competing interests

None declared.

Authors' Contributions

Yi-Wen Tsai had the original idea for the study, contributed to the design and wrote the paper. Lee-Lan Yen contributed to survey design and advised on paper organization. Chung-Lin Yang and Pei-Fen Chen managed the design and implementation of survey and contributed to the analysis and interpretation.

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