

Expansion of Statutory Smoke-free Area and Tobacco Tax Raise

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1. Introduction

Smoking is a major cause of premature death. Each year, tobacco kills nearly 6 million people globally, including more than 600,000 non-smokers by secondhand smoke (SHS)¹. During the past decades, tobacco control has contributed to global health prominently, and the World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC), the first international health treaty negotiated by WHO has propelled the tobacco control into a new era². In order to determine the impact of and opinions on tobacco control policies, many countries have carried out surveys on policies either implemented or under consideration. A number of surveys have assessed the impact of tobacco control policies (e.g. smoke-free laws) including the National Health and Nutrition Examination Survey (NHANES)³, the International Tobacco Control (ITC) Surveys⁴ and the Global Adult Tobacco Survey (GATS)⁵. The ITC surveys were designed to evaluate the demand reduction due to the WHO FCTC and have been carried out in Canada, USA, Australia and UK, and more recently in Asia (e.g. China, India and Bangladesh). GATS has been used in more than 15 countries and includes topics such as tobacco use, exposure to advertising and economic aspects.

In Hong Kong, many tobacco control measures have been implemented to increase tobacco tax, protect the population from SHS, ban advertising of tobacco products and encourage smokers to quit. The current report focused on the prevalence of SHS exposure,

active smoking, the level of public support for current and future tobacco control measures and the impact of existing tobacco control policies in Hong Kong.

2. Methods

Computer-assisted telephone interviews based on an anonymous and structured questionnaire were conducted from March to July 2013. Participants aged 15 to 65 speaking Cantonese or Mandarin were randomly selected according to their residential telephone numbers. When telephone contact was successfully established with a target household, one eligible person was selected from all eligible family members using the "next birthday" procedure. Respondents were divided into three groups, i.e. current smokers who, at the time of the survey, smoked any tobacco product daily or occasionally; ex-smokers, who formerly smoked and never smokers, who never smoked in their entire life.

After a probability sample with sufficient never smokers (801 never smokers, together with 138 ex-smokers and 100 current smokers, total 1,039 respondents) had been recruited, only ex- and current smokers were further recruited to achieve a total of 800 for each group (i.e. over-sampling after completion of probability sampling).

Questions were divided into two categories (a) core questions for all respondents in any particular smoking group and (b) random questions for randomly selected subsets of the respondents. Consenting participants were asked about their current level of SHS exposure, opinions of current and future tobacco control policies, use of smoking cessation services, smoking-related attitudes, behaviours and knowledge and socio-demographic characteristics.

The overall survey sample was weighted to compensate for oversampling of ex- and current smokers and to make it representative of the Hong Kong population. The chi-square test was used to test whether differences among smoking groups were statistically significant if the variable was categorical, and univariate regression if the variable was continuous. Multivariate logistic regression analysis was used for

key variables, adjusted for socio-demographic factors. Apart from overall prevalence of smoking, which was initially ascertained from the probability sample, all analyses were done using the weighted overall sample.

3. Results

3.1 Sample characteristics

In total, 2,401 participants were recruited, with 801 classified as never smokers, 800 ex-smokers and 800 current smokers (response rate 73.7%). Table 1 shows the characteristics of the weighted overall survey sample. Among never smokers, 36.7% were college/university graduates which were higher than ex- (22.0%) and current smokers (21.9%) ($p < 0.001$). Higher proportion of current smokers (61.0%) was employed than never (34.5%) and ex-smokers (48.5%) ($p < 0.001$).

Table 1 Characteristics of the weighted overall survey sample

	Never smokers N=801	Ex-smokers N=800	Current smokers N=800	Total N=2,401	p-value [§]
Sex					<0.001
Male	38.8%	82.9%	82.8%	45.5%	
Female	61.2%	17.1%	17.2%	54.5%	
Age, years (mean, SE)					<0.001 [¶]
	38.4 (0.5)	50.3 (0.5)	42.2 (0.4)	39.3 (0.5)	
Education level					<0.001
No formal education	0.9%	1.7%	0.9%	0.9%	
Primary school	6.6%	15.0%	13.3%	7.7%	
Secondary school	51.4%	54.4%	59.5%	52.4%	
College/University	36.7%	22.0%	21.9%	34.4%	
Marital status					<0.001
Single	40.2%	14.7%	31.3%	38.1%	
Married/Cohabited	54.6%	79.6%	62.7%	56.6%	
Widowed/Separated	1.1%	2.6%	2.9%	1.3%	
Employment status					<0.001
Employee	34.5%	48.5%	61.0%	38.0%	
Employer	1.8%	1.7%	3.4%	1.9%	
Self employed	4.4%	8.1%	12.0%	5.4%	
Student	18.6%	1.7%	3.2%	16.2%	
Home-maker	25.8%	6.7%	2.8%	22.5%	
Unemployed	3.7%	7.8%	6.7%	4.2%	
Retired/Elderly	7.1%	20.7%	8.2%	7.8%	

[§] p-value of chi-square test

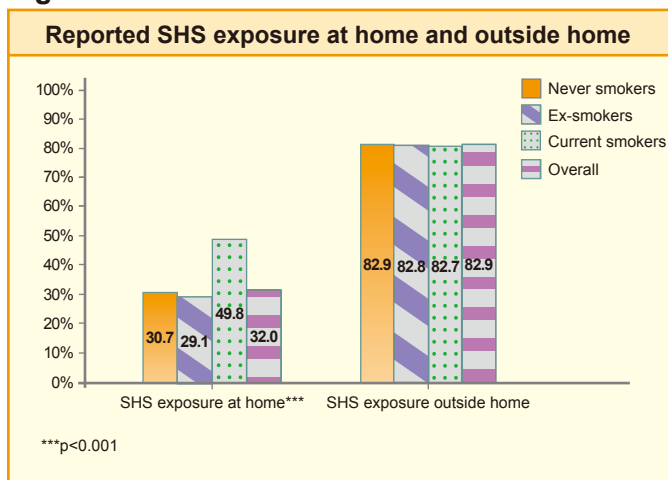
[¶] p-value of t-test, $p < 0.001$ for all comparisons between never and ex-smokers, never and current smokers and ex- and current smokers

Results were weighted to 2013 Hong Kong population by age and sex for each smoking group; results for total were further weighted to 2012 Hong Kong smoking prevalence⁶

3.2 Reported SHS exposure

Among all respondents, any SHS exposure at home was reported by 32.0% (30.7% of never, 29.1% of ex- and 49.8% of current smokers, $p<0.001$). Exposure to SHS outside home (e.g. on the street, outdoor restaurant) in the past 7 days was reported by 82.9% with no significant difference between groups ($p=0.11$) (Figure 1).

Figure 1



In the past 30 days, 39.0% of those who worked outside their home reported someone smoking near them in indoor areas of the workplace including inside vans (34.7%, 40.9% and 55.9% of never, ex- and current smokers, $p<0.001$) (Table 2). Smoking indoors was reported by 64.7% of bar visitors (61.1%, 74.2% and 75.7% of never, ex- and current smokers, $p<0.01$) and 13.3% of shopping malls visitors (13.1%, 11.7% and 15.2% of never, ex- and current smokers, $p=0.43$). Around a quarter of respondents who had taken a taxi or a minibus smelled smoke in the taxi (27.8%; 27.0%, 34.9% and 30.9% of never, ex- and current smokers, $p=0.18$) or minibus (22.8%; 21.4%, 31.3% and 30.4% of never, ex- and current smokers, $p<0.001$).

In the past 30 days, in areas not yet designated smoke-free, 45.8% and 66.6% of all non-smokers (never and ex-smokers) had been bothered by smoking near doorways and in the street respectively, 61.2% of all respondents reported SHS exposure at a bus stop or public transport interchange. Of bar visitors, 82.2% were exposed outside the bar (Table 3).

Table 2 Reported SHS exposure in designated smoke-free areas in the past 30 days

Designated smoke-free areas	Never smokers		Ex-smokers		Current smokers		Overall	
	%	N	%	N	%	N	%	N
Indoor areas of the workplace***	34.7	242	40.9	375	55.9	548	39.0	1,165
Inside bars**	61.1	55	74.2	74	75.7	171	64.7	300
Shopping malls	13.1	703	11.7	709	15.2	634	13.3	2,046
Inside taxi	27.0	554	34.9	583	30.9	626	27.8	1,763
Inside minibus***	21.4	661	31.3	684	30.4	680	22.8	2,025

*** $p<0.001$

** $p<0.01$

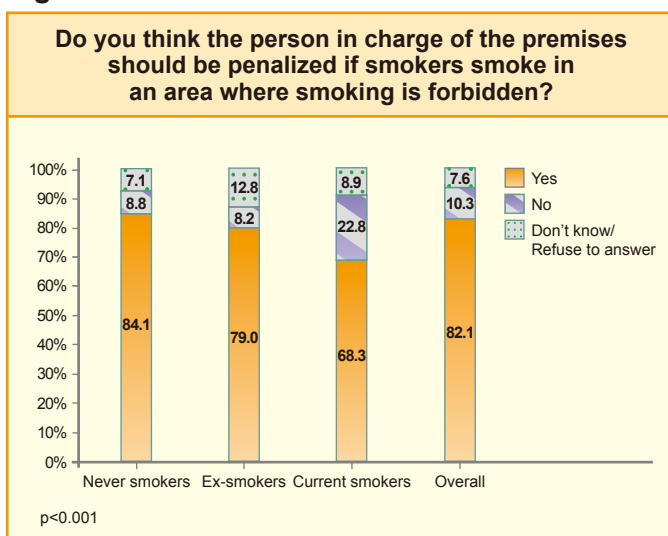
Table 3 Reported SHS exposure in non-designated smoke-free areas in the past 30 days

Areas not designated smoke-free	Never smokers		Ex-smokers		Current smokers		Overall	
	%	N	%	N	%	N	%	N
Outside bars	78.8	55	89.8	74	93.0	171	82.2	300
Public transport interchanges (e.g. bus stops)	60.5	780	65.9	781	64.5	770	61.2	2,331
On streets	66.8	801	62.0	800	--	--	66.6	1,601
Doorways of buildings	45.8	801	46.6	800	--	--	45.8	1,601

3.3 Opinions on tobacco control policy with regard to SHS exposure

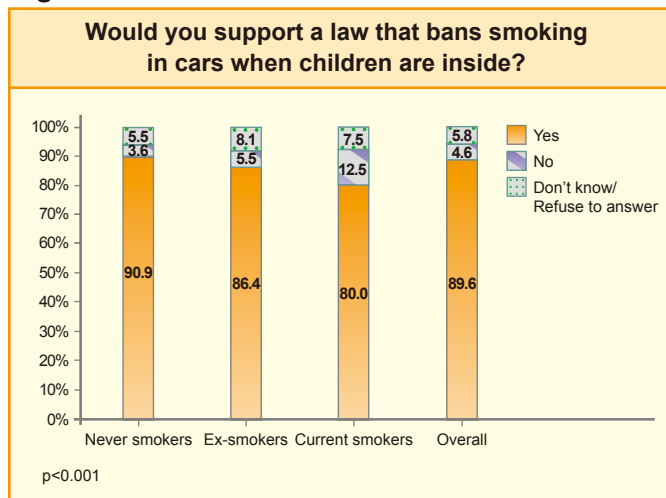
Most respondents (82.1%) thought that the person in charge should be penalized if people smoke in designated no smoking areas (Figure 2). Current smokers were less likely to think so (68.3% vs. 84.1%, OR=0.27, $p<0.001$) than never smokers after adjustment for sex, age, education level, marital status and employment status, but ex-smokers did not differ from never smokers (79.0% vs. 84.1%, OR=0.87, $p=0.62$).

Figure 2



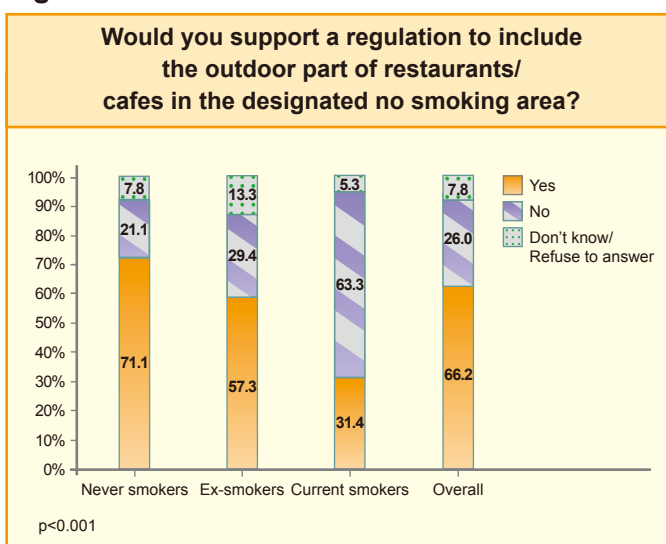
Most respondents (89.6%) supported a ban on smoking in cars when there are children inside and even 80.0% of current smokers supported the ban, though the proportion was lower than never (90.9%) and ex-smokers (86.4%) ($p<0.001$) (Figure 3). After adjustment for sex, age, education level, marital status and employment status, current smokers were less likely than never smokers to agree to this (OR=0.25, $p<0.001$) but ex-smokers were not significantly different (OR=0.57, $p=0.13$) from never smokers.

Figure 3



About two thirds of respondents (66.2%) supported inclusion of the outdoor areas of restaurants or cafes as designated no smoking areas (Figure 4). A significantly lower proportion of current smokers (31.4%) than never (71.1%) and ex-smokers (57.3%) ($p<0.001$) supported this proposal after adjustment for sex, age, education level, marital status and employment status (current smokers OR=0.16, $p<0.001$, ex-smokers OR=0.62, $p=0.013$, compared with never smokers).

Figure 4



3.4 Opinion on tobacco control policy on smoke-free areas

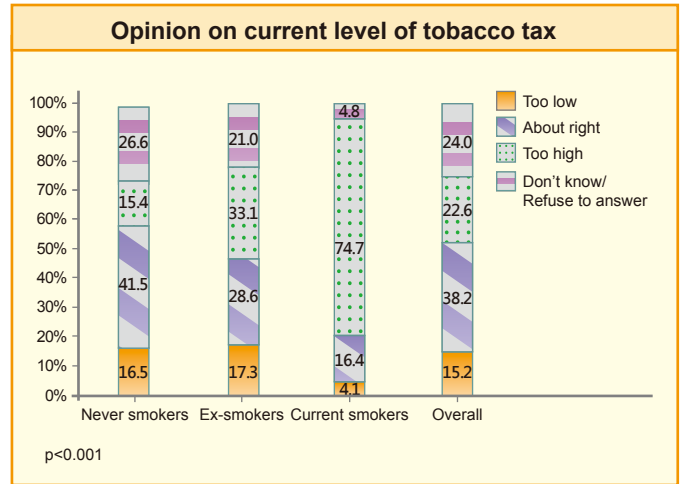
Of randomly selected respondents, more than one quarter (27.2%) opined that the current designated no smoking areas were not enough, 28.9%, 26.7% and 11.0% of never, ex- and current smokers respectively (p=0.51). Among those who thought it was not enough, 78.4% supported to include all restaurants (indoor and especially outdoor areas); 61.3% supported to include all streets; 55.4% supported to include all public places (e.g. parks, outdoor areas); another 11.1% supported to include places such as bus stops, downtown (crowded) places, all transportation vehicles, all doorways, or all places with a roof (e.g. a bridge), as designated no smoking areas.

3.5 Effect of and opinion on tobacco control policy with regard to tobacco tax

Among all current smokers, 31.4% reported that they changed their daily cigarette consumptions (i.e. stopped or reduced smoking) because of the tax increase in 2011. Among ex-daily smokers who quit after 2011, 32.8% stated that tax increase made them more determined to quit (30.3% and 45.8% of males and females, p=0.59). Among all ex-daily smokers, 10.5% stated the reason to quit as “cigarettes are too expensive”.

Among all 2,401 respondents, 38.2% regarded the current tobacco tax was set about right, but 15.2% thought it was too low while 22.6% thought too high (Figure 5). More ex- (17.3%) and never smokers (16.5%) than current smokers (4.1%) (p<0.001) thought the current tax level was too low .

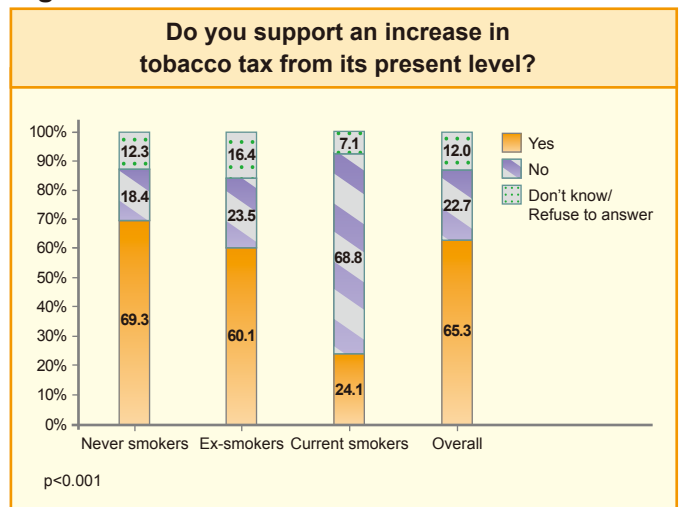
Figure 5



The majority of randomly selected respondents (65.3%) supported an increase in tobacco tax from the level at the time of interview (Figure 6). After adjustment for sex, age, education level, marital status and employment status, current smokers were less likely to support a tax increase (OR=0.17, p<0.001) than never smokers. Specifically, 36.1% (95%CI=25.2-47.1%) of those randomly selected current smokers who intended to quit supported the tax increase but the proportion was 11.1% (95%CI=4.0-18.2%) of those who did not intend to quit (p<0.001).

On average, a 29.7% (95%CI=25.0-34.6%) increase in tobacco tax was proposed by those who supported tobacco tax increase and it was notable that 7.5% of them proposed a 100% increase.

Figure 6



4. Discussion

4.1 Secondhand smoke exposure and opinion on smoke-free policies

From 1st January 2007, the Smoking (Public Health) (Amendment) Ordinance (Cap.371) was implemented but the current survey has shown that many people are still exposed to SHS even in areas which should be smoke-free such as inside bars and indoor areas of the workplace. There is a high level of public support for more comprehensive smoke-free policies. In Japan, busy street smoking bans have been implemented and there are penalties against the violation of the bans⁷. In Singapore, smoking is not allowed in all common areas of residential estates, e.g. linkways from bus stops to residential blocks, corridors, and stairwells⁸. In the U.S. and U.K., as well as many cities in Mainland China, the person in charge of the premises is responsible and liable to penalty if someone smokes in a smoke-free area⁹⁻¹¹. Most respondents in this survey thought that such policies should also be implemented in Hong Kong.

4.2 Impact of and opinion on tobacco tax

In February 2009, the tobacco tax was raised by 50% and in February 2011, by 41.5% making it about 68% of the retail price of a pack of cigarettes. Increases in tobacco tax are effective in deterring young people from smoking and encouraging quitting^{12,13}. The current survey provided new local evidence that increasing tobacco tax is effective in reducing current smokers' daily cigarette consumption and helping them quit. The tax as a percentage of major cigarette retail prices in Hong Kong is lower than the U.K. (80.12%)¹⁴, Finland (79.88%), France (79.86%), Denmark (79.33%) and Ireland (78.97%) and is below 70%, the minimum level recommended by WHO. From the current survey, majority of the respondents supported a tobacco tax increase and a few proposed a 100% increase.

6. Acknowledgements

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4.3 Limitations and strengths of the survey

This was a cross-sectional survey which collected only self-reported data. The respondents were all aged 15 to 65 years so the impact of tobacco control policy on children and older people was not specifically measured. However, the information on SHS exposure in public places and at home can indicate that SHS exposure of children and older adults is still common. The term 'current smokers' refers to both daily and occasional smokers and 'ex-smokers' refers to ex-daily and ex-occasional smokers. For the purposes of this survey, it was not necessary to distinguish between daily and occasional use. All information was collected by telephone survey which did not allow face to face interaction with the interviewers. However it also gave a degree of anonymity and might collect more truthful data. The validity of the data collected appeared high when consistency between different questions was checked. It is recommended to increase the sample size of future surveys to allow for more precise estimates and more random questions.

5. Conclusions

The existing tobacco control policies have assisted some smokers in reducing or quitting smoking, but gaps in compliance with current smoke-free regulations still exist. There is strong support for extension of smoke-free areas, penalty on the person in charge of premises if someone smokes in a smoke-free area, and banning smoking in cars when children are present and in outdoor areas of restaurants and cafes. There is also support for an increase in tobacco tax from its current level.

7. References

- ¹ World Health Organization.(2013). *Tobacco, Key Facts (Factsheet No. 339)*. Geneva : World Health Organization.
- ² World Health Organization.(2003). *WHO Framework Convention on Tobacco Control*. Geneva: World Health Organization.
- ³ Max W, Sung HY, Shi Y.(2009). Who is exposed to secondhand smoke? Self-reported and serum cotinine measured exposure in the U.S., 1999-2006. *International Journal of Environmental Research and Public Health*, 2009 May; 6:1633-48.
- ⁴ ITC Project.(2012). *Smoke-free Policies: ITC Cross-Country Comparison Report*. Ontario: University of Waterloo.
- ⁵ Global Adult Tobacco Survey Collaborative Group.(2011). *Tobacco Questions for Surveys: A Subset of Key Questions from the Global Adult Tobacco Survey (GATS), 2nd edition*. Atlanta, GA: Centers for Disease Control and Prevention.
- ⁶ Census & Statistics Department.(2013). Pattern of smoking. *Thematic Household Survey Report No. 53*. Hong Kong: Census & Statistics Department.
- ⁷ Ueda H, Armada F, Kashiwabara M, Yoshimi I.(2011). Street smoking bans in Japan: a hope for smoke-free cities? *Health Policy*. 2011 Sep; 102:49-55.
- ⁸ National Environment Agency.(2013). Smoking Prohibition.Singapore. Retrieved Sept 26, 2013 from: <http://app2.nea.gov.sg/public-health/smoking/smoking-prohibition#smokefree>
- ⁹ The Floride Legislature.(2010). The 2010 Florida Statutes (including Special Session A) Stat. 386.207. Retrieved Sep 24, 2013 from: http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=0300-0399/0386/Sections/0386.207.html
- ¹⁰ Alaska Legal Resource Centre.(2011). Alaska Statutes Stat. 18.35.330 (2011). Retrieved Sep 24, 2013 from : <http://www.touchngo.com/iglcnt/akstats/Statutes/Title18/Chapter35/Section330.htm>
- ¹¹ HM Government National Health Service.(2012). *England Becomes Smokefree 1 July 2007. Your Guide to the New Smokefree Law*. England: HM Government National Health Service.
- ¹² Hong Kong Council on Smoking and Health.(2012). COSH advocates to Financial Secretary for raising tobacco tax in Financial Year 2012-2013[Press release]. Retrieved Sep 26, 2013 from : <http://www.cosh.org.hk/en/content/web.do?page=news20120130>
- ¹³ School of Public Health, The University of Hong Kong.(2011). HKU study provides first evidence that rise in tobacco tax curbs adolescent smoking[Press release]. Retrieved Sep 26, 2013 from : http://www.hku.hk/press/news_detail_6450.html
- ¹⁴ World Health Organization.(2013). *WHO Report on the Global Tobacco Epidemic 2013*. Geneva: World Health Organization.



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