Association between tobacco industry denormalisation beliefs and support for tobacco endgame policies: a population-based study in Hong Kong

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ABSTRACT

Objectives To examine the associations between tobacco industry denormalisation (TID) beliefs and support for tobacco endgame policies.

Methods A total of 2810 randomly selected adult respondents of population-based tobacco policy-related surveys (2018–2019) were included. TID beliefs (agree vs disagree/unsure) were measured by seven items: tobacco manufacturers ignore health, induce addiction, hide harm, spread false information, lure smoking, interfere with tobacco control policies and should be responsible for health problems. Score of each item was summed up and dichotomised (median=5, >5 strong beliefs; ≤5 weak beliefs). Support for tobacco endgame policies on total bans of tobacco sales (yes/no) and use (yes/no) was reported. Associations between TID beliefs and tobacco endgame policies support across various smoking status were analysed, adjusting for sociodemographics.

Results Fewer smokers (23.3%) had strong beliefs of TID than ex-smokers (48.4%) and never smokers (48.5%) (p<0.001). Support for total bans on tobacco sales (74.6%) and use (76.9%) was lower in smokers (33.3% and 35.3%) than ex-smokers (74.3% and 77.9%) and never smokers (76.0% and 78.3%) (all p values<0.001). An increase in the number of TID beliefs supported was positively associated with support for a total ban on sales (adjusted risk ratio 1.06, 95% CI 1.05 to 1.08, p<0.001) and use (1.06, 95% CI 1.05 to 1.07, p<0.001). The corresponding associations were stronger in smokers than non-smokers (sales: 1.87 vs 1.25, p value for interaction=0.03; use: 1.78 vs 1.21, p value for interaction=0.03).

Conclusion Stronger TID belief was associated with greater support for total bans on tobacco sales and use. TID intervention may increase support for tobacco endgame, especially in current smokers.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Studies on tobacco industry denormalisation (TID) beliefs have mostly been conducted in Western countries with tobacco control policies.
⇒ TID beliefs associated with support for tobacco control policies were found among current non-smokers in a sample of Hong Kong adolescents.

WHAT THIS STUDY ADDS

⇒ Current smokers were less likely than non-smokers to support tobacco endgame policies and TID beliefs among adults in Hong Kong.
⇒ Stronger TID beliefs were associated with greater support for total bans on tobacco sales and use.
⇒ Associations between TID beliefs and endgame policies were stronger in smokers than non-smokers.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ TID may be considered as a part of tobacco endgame promotion strategies.
⇒ Research on understanding the opposition to tobacco endgame policies and the negative belief of TID is warranted.

INTRODUCTION

Tobacco endgame aims to reduce smoking prevalence to a very low level, tipically less than 5% or 1%.[1 2] Several policies have been suggested including regulating the tobacco market,[2] removing substances from tobacco products,[3] smoke-free generation (prohibition of sales of tobacco products to people born after a certain year)[4 5] and a total ban on tobacco sales and use,[6] to lower the availability, consumer attractiveness and addictiveness of tobacco products.[7] An increasing number of countries have set tobacco endgame goals to reduce smoking prevalence to 5% or lower to end tobacco use, including New Zealand (2025), Ireland (2025), Sweden (2025), England (2030), Scotland (2034), Finland (2030), Wales (2030), and Malaysia (2040).[8] Achieving endgame goals could bring profound health benefits, but tobacco industry has used a variety of tactics to mobilise public to against the tobacco endgame policies.[9]

Tobacco industry denormalisation (TID) belief is an underused strategy for revealing tobacco industry misconduct.[10] WHO has urged greater public awareness of the tobacco industry's responsibility for the tobacco epidemic and has backed initiatives to draw attention to its deceptive and manipulative interventions.[11] An international survey involving a sample of Australia, Canada, the UK and the USA reported that TID exposure

Table 1 Differences in demographic characteristics by smoking status (n=2810)

	Total* (n=2810)	Current smoker (n=279)	Ex-smoker (n=862)	Never smoker (n=1669)	
	N (weighted %)	N (weighted %)	N (weighted %)	N (weighted %)	P value†
Sex					
Male	1481 (56.6)	240 (85.3)	711 (82.9)	530 (38.1)	<0.001
Female	1329 (43.4)	39 (14.7)	151 (17.1)	1139 (61.9)	
Age, (years)					
15–29	323 (14.4)	20 (10.7)	31 (1.9)	272 (21.5)	<0.001
30–49	521 (31.0)	73 (46.0)	104 (19.1)	344 (34.6)	
50–65	987 (30.6)	99 (28.2)	326 (38.3)	562 (27.1)	
>65	964 (23.9)	87 (15.2)	397 (40.7)	480 (16.8)	
Educational attainment					
Primary or below	559 (14.2)	59 (11.4)	218 (23.1)	282 (10.1)	<0.001
Secondary	1315 (46.7)	164 (63.3)	426 (50.7)	725 (41.8)	
Tertiary	914 (39.1)	55 (25.3)	211 (26.1)	648 (48.1)	
Marital status					
Single	601 (28.1)	61 (33.3)	97 (10.7)	443 (36.2)	<0.001
Married/cohabited	1848 (63.6)	180 (56.7)	672 (80.4)	996 (56.2)	
Divorced/separated	103 (3.1)	24 (7.1)	31 (3.6)	48 (2.1)	
Widowed	226 (5.2)	12 (2.9)	53 (5.3)	161 (5.5)	
Household income (HK$, US$1=HK$7.8)					
No income	154 (4.6)	10 (2.6)	60 (7.2)	84 (3.6)	<0.001
<10k	399 (12.6)	47 (11.9)	156 (18.6)	196 (9.5)	
10–19k	345 (13.8)	33 (13.8)	117 (15.7)	195 (12.7)	
20–29k	452 (20.0)	52 (23.8)	127 (17.2)	273 (20.8)	
30–39k	300 (13.6)	34 (14.9)	88 (12.3)	178 (14.0)	
>40k	722 (35.5)	64 (33.0)	196 (30.0)	462 (39.4)	
Children, n					
No child	763 (35.2)	84 (44.2)	144 (17.7)	535 (42.7)	<0.001
1	533 (19.9)	51 (17.5)	191 (24.5)	291 (17.8)	
2	883 (29.7)	85 (26.8)	294 (34.8)	504 (27.6)	
3	555 (15.2)	49 (11.5)	212 (23.0)	294 (11.9)	
Health status					
Extremely good	220 (8.4)	28 (10.2)	61 (7.4)	131 (8.6)	0.17
Very good	678 (26.1)	55 (23.4)	202 (24.5)	421 (27.3)	
Good	748 (27.4)	71 (24.3)	228 (27.3)	449 (28.0)	
Average	966 (32.9)	100 (34.1)	308 (34.9)	558 (31.7)	
Poor	166 (5.2)	23 (8.0)	54 (5.9)	89 (4.4)	

Data were weighted by the age, sex and smoking status of the Hong Kong general population in 2018.
*Sample size varies due to the missing data.
†P value was from the χ^2 test.

was linked to support for industry regulations.[12] Our previous survey of Hong Kong adolescents found that TID beliefs were associated with support for tobacco control policies in current non-smokers.[13] Knowledge of industry deception contributes to distrust of the industry, which in turn is linked to support for actions against the industry,[14] such as support for tobacco control policies. None has examined the association between TID belief and support for tobacco endgame policies across different smoking status.

Hong Kong has implemented effective tobacco control policies in a multipronged manner since 1982, including progressive tobacco tax increases, plain packaging, the expansion of smoke-free areas and a total ban on alternative tobacco. Daily smoking prevalence dropped from 23.2% in 1982 to 9.5% in 2021.[15] The government aims to reduce daily smoking rates to 7.8% by 2025,[16] and advocacy groups have called for reducing the smoking rate to less than 5% to end tobacco epidemic.[17] Tobacco companies have used various tactics, such as political lobbying, campaign contributions and funding research to influence the course of regulatory and policy-making,[18 19] interfering with the progress of tobacco control policies in Hong Kong.

We assessed the prevalence of support for tobacco endgame policies and TID beliefs among respondents with various smoking status in Hong Kong, as well as the associations between TID beliefs and support for tobacco endgame policies.

METHODS

Study design and sampling

Data were combined from two Tobacco Control Policy-related Surveys (TCPS) funded by the Hong Kong Council on Smoking and Health. The two population-based surveys were conducted in February–June 2018 (n=5132) and September 2018 to March 2019 (n=5156). The overall response rates were 73.5% (5132 completed cases divided by 6983 eligible cases interviewed) and 82.4% (5156 completed cases divided by 6256 eligible cases

Table 2 TID beliefs and support for tobacco endgame policies by smoking status (n=2810)

	Total* (n=2810)	Current smoker (n=279)	Ex-smoker (n=862)	Never smoker (n=1669)	
	N (weighted %)	N (weighted %)	N (weighted %)	N (weighted %)	P value†
TID beliefs					
Tobacco manufacturers ignore public health for profit					<0.001
Disagree/unsure	665 (21.9)	136 (45.3)	192 (22.3)	337 (20.4)	
Agree	2078 (78.1)	137 (54.7)	641 (77.7)	1300 (79.6)	
Tobacco manufacturers deliberately add nicotine to tobacco to ensure user addiction					<0.001
Disagree/unsure	820 (29.9)	134 (46.5)	249 (32.1)	437 (28.8)	
Agree	1723 (70.1)	121 (53.5)	509 (67.9)	1093 (71.2)	
Tobacco manufacturers try to cover up and downplay the dangers of smoking					<0.001
Disagree/unsure	742 (25.6)	137 (46.8)	221 (25.9)	384 (24.3)	
Agree	1954 (74.4)	132 (53.2)	603 (74.1)	1219 (75.7)	
Tobacco manufacturers disseminate false or incomplete information about smoking and health					<0.001
Disagree/unsure	1011 (40.7)	163 (61.7)	267 (34.0)	581 (39.8)	
Agree	1590 (59.3)	96 (38.3)	518 (66.0)	976 (60.2)	
Tobacco manufacturers need to be held accountable for public health problems caused by smoking					<0.001
Disagree/unsure	900 (32.3)	148 (55.8)	280 (33.3)	472 (30.8)	
Agree	1832 (67.7)	125 (44.2)	549 (66.7)	1158 (69.2)	
Tobacco manufacturers have been luring more people to smoke					<0.001
Disagree/unsure	968 (35.2)	157 (58.3)	281 (33.6)	530 (33.9)	
Agree	1746 (64.8)	116 (41.7)	554 (66.4)	1076 (66.1)	
Tobacco manufacturers block government to strengthen tobacco control policies					<0.001
Disagree/unsure	1135 (45.4)	172 (69.2)	338 (45.0)	625 (43.9)	
Agree	1372 (54.6)	87 (30.8)	433 (55.0)	852 (56.1)	
TID beliefs (as a dichotomous variable, 0–7, median=5)					<0.001
Weak TID beliefs (0–5)	1175 (52.8)	170 (76.7)	339 (51.6)	666 (51.5)	
Strong TID beliefs (6-7)	1054 (47.2)	55 (23.3)	315 (48.4)	684 (48.5)	
TID beliefs (as a three-category variable, 0–7)					<0.001
Weak TID beliefs (0–3)	682 (30.2)	132 (60.7)	177 (26.8)	373 (28.6)	
Moderate TID beliefs (4-5)	493 (22.7)	38 (16.0)	162 (24.8)	293 (23.0)	
Strong TID beliefs (6-7)	1054 (47.2)	55 (23.3)	315 (48.4)	684 (48.5)	
TID beliefs (as a four-category variable, 0–7)					<0.001
No belief (0)	166 (5.5)	51 (20.7)	43 (6.1)	72 (4.6)	
Weak TID beliefs (1-3)	516 (24.7)	81 (40.0)	134 (20.7)	301 (24.0)	
Moderate TID beliefs (4-5)	493 (22.7)	38 (16.0)	162 (24.8)	293 (23.0)	
Strong TID beliefs (6-7)	1054 (47.2)	55 (23.3)	315 (48.4)	684 (48.5)	
Support for a total ban on tobacco sale					<0.001
No	696 (25.4)	161 (66.8)	204 (25.7)	331 (24.0)	
Yes	1977 (74.6)	107 (33.3)	615 (74.3)	1255 (76.0)	
Support for total ban on tobacco use					<0.001
No	641 (23.1)	159 (64.7)	176 (22.1)	306 (21.7)	
Yes	2063 (76.9)	113 (35.3)	644 (77.9)	1306 (78.3)	

Data were weighted by the age, sex and smoking status of the Hong Kong general population in 2018.
*Sample size varies due to the missing data.
†P value was from the $\chi 2$ test.
TID, tobacco industry denormalisation.

interviewed), respectively. The details of the TCPS have been reported elsewhere.[20–22] Briefly, a computer-assisted telephone interview system using an anonymous and structured questionnaire was used to recruit Cantonese-speaking Chinese residents (one selected from a household according to the proximity of their next birthday to the interview date) aged 15 years or above with oversampling of current and ex-smokers. The sample frame was generated using the 'plus/minus one/two' method from the telephone number of a residential directory. This study comprised 2810 respondents who were chosen at random to report both TID beliefs and support for total bans on tobacco sales and use. The details of sample characteristics are shown in table 1.

Measurements

TID beliefs included seven items based on the WHO's report[23]: tobacco manufacturers ignore health, induce addiction, hide harms, spread false information, lure smoking, interfere with policies and should be responsible for health problems. Responses were 5-point semantic scales: strongly disagree (1), disagree (2), uncertain (3), agree (4) and strongly agree (5), with a 'difficult/

Table 3 The associations of TID beliefs with support for the tobacco endgame policies within 10 years from 2018 (n=2810)

	Total ban on tobacco sales			Total ban on tobacco use		
	Complete case		Imputed*	Complete case		Imputed*
	Crude RR (95% CI)	aRR† (95% CI)	aRR (95% CI)	Crude RR (95% CI)	aRR† (95% CI)	aRR (95% CI)
TID beliefs (agree vs disagree or unsure)						
Tobacco manufacturers ignore public health for profit	1.30 (1.22 to 1.40)‡	1.27 (1.18 to 1.37)‡	1.24 (1.10 to 1.41)‡	1.29 (1.21 to 1.38)‡	1.25 (1.16 to 1.34)‡	1.23 (1.08 to 1.39)‡
Tobacco manufacturers deliberately add nicotine to tobacco to ensure user addiction	1.28 (1.21 to 1.36)‡	1.25 (1.17 to 1.34)‡	1.22 (1.09 to 1.37)‡	1.24 (1.18 to 1.32)‡	1.20 (1.13 to 1.28)‡	1.19 (1.06 to 1.33)§
Tobacco manufacturers try to cover up and downplay the dangers of smoking	1.24 (1.16 to 1.32)‡	1.19 (1.12 to 1.27)‡	1.17 (1.04 to 1.32)§	1.25 (1.18 to 1.33)‡	1.23 (1.15 to 1.30)‡	1.20 (1.07 to 1.35)§
Tobacco manufacturers disseminate false or incomplete information about smoking and health	1.24 (1.17 to 1.30)‡	1.16 (1.09 to 1.22)‡	1.14 (1.02 to 1.27)¶	1.21 (1.15 to 1.27)‡	1.12 (1.06 to 1.18)‡	1.10 (1.00 to 1.22)
Tobacco manufacturers need to be held accountable for public health problems caused by smoking	1.41 (1.33 to 1.50)‡	1.35 (1.26 to 1.45)‡	1.32 (1.18 to 1.48)‡	1.36 (1.28 to 1.44)‡	1.30 (1.22 to 1.38)‡	1.29 (1.15 to 1.43)‡
Tobacco manufacturers have been luring more people to smoke	1.20 (1.13 to 1.26)‡	1.13 (1.07 to 1.20)‡	1.12 (1.01 to 1.25)¶	1.19 (1.13 to 1.25)‡	1.13 (1.07 to 1.19)‡	1.12 (1.01 to 1.24)¶
Tobacco manufacturers block government to strengthen tobacco control policies	1.30 (1.23 to 1.37)‡	1.23 (1.16 to 1.30)‡	1.21 (1.09 to 1.35)‡	1.29 (1.23 to 1.35)‡	1.22 (1.16 to 1.28)‡	1.20 (1.09 to 1.34)‡
TID beliefs (as a dichotomous variable, 0–7, median=5)						
Weak TID beliefs (≤5 statements)	Ref	Ref	Ref	Ref	Ref	Ref
Strong TID beliefs (>5 statements)	1.35 (1.28 to 1.43)‡	1.27 (1.20 to 1.35)‡	1.26 (1.13 to 1.41)‡	1.31 (1.25 to 1.37)‡	1.24 (1.18 to 1.31)‡	1.23 (1.10 to 1.37)‡
TID beliefs (as a continuous variable, 0–7)**	1.08 (1.06 to 1.09)‡	1.06 (1.05 to 1.08)‡	1.06 (1.03 to 1.09)‡	1.07 (1.06 to 1.08)‡	1.06 (1.05 to 1.07)‡	1.06 (1.03 to 1.08)‡

RR>1 indicates support for tobacco endgame policies.
*Analysis based on imputed data. Adjusting for sex, age, education, income and smoking status.
†Adjusting for sex, age, education, income and smoking status.
‡<0.001.
§<0.01.
¶<0.05.
**The responses of each TID belief were combined as 'strongly disagree/disagree/uncertain (scores 0)' and 'strongly agree/agree (scores 1)'. The scores of each item were summed and ranged from 0 to 7. Every extra point denotes support for one more TID belief.
TID, tobacco industry denormalisation.

Table 4 The association between TID beliefs and support for tobacco endgame policies among respondents with different smoking status (n=2810)

	Total ban on tobacco sales		Total ban on tobacco use	
	aRR* (95% CI)	P value for interaction	aRR* (95% CI)	P value for interaction
Smoking status		0.03		0.03
Non-smokers	1.25 (1.18 to 1.32)†		1.21 (1.15 to 1.27)†	
Current smokers	1.87 (1.31 to 2.65)†		1.78 (1.26 to 2.53)†	

Independent variable: TID beliefs (as a dichotomous variable: strong beliefs vs weak beliefs).
Non-smokers includes never smokers and ex-smokers.
RR>1 indicates support for tobacco endgame policies.
*Adjusting for sex, age, education and income.
†<0.001.
TID, tobacco industry denormalisation.

refuse to answer' option available. The responses were combined as 'strongly disagree/disagree/uncertain (scores 0)' and 'strongly agree/agree (scores 1)' for data analysis. The score of each item was summed and dichotomised based on a median score of 5 (>5 strong beliefs; ≤5 weak beliefs). The internal consistency and the split-half coefficients of the 7-item TID beliefs were 0.89 and 0.81, respectively, suggesting satisfactory reliability. Exploratory factor analysis support one factor structure, explaining 60.98% of the total variance. The factor loading of each item ranged from 0.70 to 0.86, indicating acceptable construct validity.

Tobacco endgame policies (total bans on tobacco sales and use) were asked using two questions 'Do you support a total ban on tobacco sales (or use) in Hong Kong and when should the ban be implemented?' with eight options 'immediately', 'within 1 year', 'within 3 years', 'within 5 years', 'within 10 years', 'after 10 years', 'not sure when' or 'did not support a total ban', as were used in previous studies.[6 24] These items were also commonly used in tobacco endgame studies.[25 26] The internal consistency of the two questions in the present study was 0.90. We categorised the responses as support (including 'immediately', 'within 1 year', 'within 3 years', 'within 5 years', 'within 10 years', 'after 10 years' and 'not sure when') or not support (including 'did not support a total ban'). Smoking status was classified as current smokers who smoked (including any forms of tobacco products) either daily or occasionally (eg, non-daily, once every a few weeks), ex-smokers who smoked in the past but had stopped and never smokers. We collected information on demographic characteristics (sex, age, marital status and number of children), socioeconomic status (educational attainment and household income) and self-rated health status (extremely good, very good, good, average and poor).

Statistical analyses

All descriptive data were weighted by sex, age and smoking status distribution of the general population in Hong Kong in 2018 to control for oversampling.[27] Poisson regression yielded adjusted risk ratios (aRR) for support of a total ban on tobacco sales and use in relation to sociodemographics, smoking status and TID beliefs. Effect modification was tested using an interaction term of TID belief multiplied by smoking status adjusting for sociodemographic characteristics. Online supplemental table 1 summarises the proportion of missing observations for each variable. Missing data were handled using multiple imputations by chained equations.[28] All variables in the analytical models were included in the imputation models. Fifty imputed datasets were created for estimation. Stata V.15.1 (Texas: StataCorp) was used for data analysis, and a two-sided p value<0.05 was considered statistically significant.

RESULTS

Table 2 shows that ignoring public health for profit (total 78.1%, current smokers: 54.7%, ex-smokers: 77.7%, never smokers: 79.6%, p<0.001) was the most supported TID belief, followed by cover-up and downplay of the dangers of smoking (total 74.4%, 53.2%, 74.1%, 75.7%, p<0.001). Tobacco manufacturers hindering the government to strengthen tobacco control policies was the least supported belief (total 54.6%, current smokers: 30.8%, ex-smokers: 55.0%, never smokers: 56.1%). Current smokers had lower support for all seven TID beliefs than ex-smokers and never smokers (all p values<0.001). Fewer current smokers (23.3%) had strong TID beliefs (median or above) than ex-smokers (48.4%) and never smokers (48.5%, p<0.001). Support for total bans on tobacco sales (74.6%) and use (76.9%) was lower in current smokers (33.3% and 35.3%) than ex-smokers (74.3% and 77.9%) and never smokers (76.0% and 78.3%) (all p values<0.001).

Table 3 shows that each TID belief was associated with support for a total ban on tobacco sales (aRRs ranged from 1.13 to 1.35, all p values<0.001) and use (aRRs ranged from 1.12 to 1.30, all p values<0.001). An increase in the number of TID beliefs supported was positively associated with support for a total ban on sales (aRR 1.06, 95% CI 1.05 to 1.08, p<0.001) and use (aRR 1.06, 95% CI 1.05 to 1.07, p<0.001). Compared with weak TID belief, the strong belief was associated with greater support for a total ban on tobacco sales (aRR 1.27, 95% CI 1.20 to 1.35) and use (aRR 1.24, 95% CI 1.18 to 1.31). The results of the imputed model were similar to those of the complete case analysis. Table 4 shows that the corresponding associations were stronger in current smokers than non-smokers (including ex-smokers and never smokers) (sales: aRR 1.87 vs 1.25, p value for interaction=0.03; use: aRR 1.78 vs 1.21, p value for interaction=0.03).

DISCUSSION

In population-based surveys in Hong Kong, we found stronger TID belief was associated with greater support for tobacco endgame policies, with a dose–response relation. The associations were robust by using both individual TID belief item and the combined TID belief score.

Each TID belief was supported by more than half of all respondents. Although not directly comparable, the prevalence of TID beliefs in our study (54.6% to 78.1%) was higher than that in a survey from the UK (28%–59%).[29] Comprehensive smoke-free legislation, public education and banning tobacco promotions implemented by the Hong Kong government may lead to a deepening of public distrust of tobacco companies.[30] Compared with our previous survey on adolescents (56.6%),[31] we observed more agreement in tobacco companies luring people to smoke (64.8%) in adults. This finding was in concordance with a previous Canadian study, which showed youth appeared less distrustful of tobacco companies than adults.[32] The stronger belief in adults may be due to awareness of the health consequences of smoking, and long-term experience of living in a society with various non-smoking norms, which contribute to a higher level of counter-industry beliefs.

TID item of the tobacco industry working to prevent governments from strengthening tobacco control policies was least

supported (54.6%). In fact, tobacco companies employ a variety of tactics to thwart government efforts to protect public health, including manipulation through front-line workers or third parties,[33] financing of scientific research,[34–36] networking with policy-makers, 'neutralising' opponents and setting regulatory agendas.[23] These should be disseminated to the public to increase the awareness. An experimental study also showed that the public held more negative attitudes and was less accepting of the tobacco industry after watching a film containing information about TID.[37]

Many respondents (76.9%) supported a total ban on tobacco use, which was higher than our previous survey in 2012 (71.2%).[6] The small increase reflects the raised health awareness and social disapproval towards smoking. Supporting a total ban on sale in our survey (74.6%) was higher than that in other countries such as USA (52.4%),[26] Canada (43.6%)[38] and European countries (34.9%),[39] which may be due to the lower smoking prevalence in Hong Kong (9.5%) versus the USA (14.2%), Canada (10%) and European Union (18.4%). This was consistent with findings of other studies.[39] Support for banning tobacco use among current smokers (35.3%) was higher than our previous study in 2012 (15.8%)[6] probably due to the increase in tobacco taxes in Hong Kong (50% in 2009, 41.4% in 2011 and 11.8% in 2014), which was found to be related to increased support for smoking ban.[40]

Stronger TID belief was associated with greater support for banning tobacco sales and use, which was in line with a previous study showing adolescents who held TID beliefs were more likely to support for tobacco control policies.[13] A survey involving smokers in four countries also reported that TID beliefs were associated with support for industry regulations.[12] Our finding, if confirmed by other prospective studies with robust experimental interventions, could provide evidence strengthening public beliefs in TID to increase population-level support for tobacco endgame policies.

We also found the associations between TID beliefs and support for tobacco endgame policies were stronger in current smokers. One possible explanation was that current smokers who recognised TID beliefs may have intentions to quit but lack triggers, thus they may expect policy formulation to force them to quit.[6] It may also be that support for tobacco endgame policies among non-smokers is already quite strong (74.3%–78.3%), leaving little room for further increase. A qualitative study found smokers might perceive the total ban on tobacco as the removal of fundamental freedoms.[41] TID beliefs, such as the recognition that the tobacco industry's strategy of undermining autonomy by deliberately inducing addiction, may promote smokers' support and acceptance of stringent tobacco control policies.[41] Interventions that enhanced beliefs about TID may improve support for policies among smokers. TID messages should be integrated into smoking cessation messages using effective approaches, such as mobile phone-based intervention.[42]

Several limitations should be noted. First, reverse causality cannot be excluded owing to the cross-sectional design, but the effect of TID beliefs on support for tobacco endgame policies seems plausible. Second, the current sample may not represent the general population owing to the non-response bias and incomplete and declining coverage of landline household telephones in Hong Kong. Information on rejected respondents was not collected, and therefore we could not estimate the potential bias. Nevertheless, the data were weighted to Hong Kong census data to account for oversampling of current and ex-smokers, as well as differences in age and sex distribution. Third, tobacco denormalisation is a broad concept, and TID beliefs in this study may not cover all tactics used by tobacco companies in Hong Kong.

CONCLUSION

Stronger TID belief was associated with greater support for banning tobacco sales and use. Interventions are needed to raise public awareness and attitudes toward TID, especially among current smokers. TID interventions may be warranted to increase support for tobacco endgame policies to promote a smoke-free Hong Kong.

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