

First- and second-hand harms of alcohol consumption in Hong Kong: a population-based study (abridged secondary publication)

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KEY MESSAGES

1. In Hong Kong, despite low per capita alcohol consumption levels, 18.2% of adults reported to have experienced second-hand harms in past year, whereas 21.2% of past-year drinkers reported to have experienced first-hand harms in past year.
2. Severe harms such as assault were rare, but public disturbance and lowered work productivity were common.
3. Neighbourhood alcohol outlet density was associated with being inconvenienced by inebriated drinkers.
4. There was extremely low support for regulating

alcohol outlets. Hence, regular monitoring of these harms is suggested; future policy actions may target high-risk drinkers (younger drinkers and binge drinkers) through happy-hour restrictions and minimum pricing regulations.

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Introduction

Alcohol misuse is one of the top risk factors worldwide for mortality, morbidity, and disability. Alcohol misuse incurs heavy social and economic burden through costs of treatment, prevention, law enforcement, and lost productivity.¹ In addition to acute and chronic health conditions, alcohol misuse can cause impaired work performance, domestic violence, and public vandalism.¹ The prevalence of second-hand alcohol harms was high among western populations, but such data are limited in Asia.

In 2008, Hong Kong eliminated 30% tax on beer and 40% tax on wine as a means to boost the economy. This resulted in an increase in per capita alcohol consumption² and in the proportion of ever-drinkers in the population.³ The Hong Kong government identifies reduction of alcohol-related harms as a priority,⁴ but few alcohol regulations have been enacted to curb the increasing trend of alcohol use. There is a lack of understanding of alcohol-related harms in the public. This study aims to describe the prevalence of various first-hand and second-hand alcohol-related harms in Hong Kong adults and to identify factors associated with different harms.

Methods

Chinese Hong Kong permanent residents aged 18 to 74 years were the target population. Between August and December 2019, 3200 respondents were interviewed through telephone by trained interviewers using a pilot-tested structured

questionnaire. The overall response rate among eligible households was 57.3%.

Data collected included respondent's sex, age, marital status, education attainment, employment status, housing type, district of residence, and monthly household income. Respondents were classified as past-year drinkers and ever drinkers when reported drinking in the past year and ever drinking, respectively, a full serving of alcohol. Past-year drinkers were asked about their past-year drinking frequency, location, and reason. Consistent with the World Health Organization's definition of heavy episodic drinking, binge drinking was defined as consuming ≥ 6 drinks on one occasion in the preceding 30 days. The four-item CAGE questionnaire was used to assess alcohol use disorder. Respondents were asked whether they had experienced second-hand harms in the past year in 24 items under four categories: friendship and social network, family, public, and work or school-related. Past-year drinkers were asked whether they had experienced first-hand harms in the past year in 32 items under the same four categories plus physical/mental and financial categories.

In addition, respondents were asked about their perception on the number of alcohol outlets and alcohol serving hours near their neighbourhood (should reduce/no change needed/should increase). Information on all on-premise alcohol outlet licences active on 7 November 2018 was obtained, as was information on 52 secondary planning units and boundary maps and demographic statistics of each unit.

TABLE 1. Prevalence of first-hand harms among past-year drinkers and second-hand harms among all respondents in past year by sex

Alcohol-related harm	Overall (n=949)*	Male (n=608)*	Female (n=341)*	P value
First-hand harm				
Physical and mental health harm				
Had short-term health problems like nausea or hangovers or sleep problems after drinking	12.1 (10.2-14.4)	12.0 (9.6-14.8)	12.3 (9.2-16.3)	0.89
Blacked-out or lost consciousness after drinking	4.7 (3.6-6.3)	5.3 (3.7-7.4)	3.8 (2.2-6.5)	0.32
Drinking contributed to smoking more than usual	1.9 (1.2-3.0)	2.3 (1.4-3.9)	1.2 (0.4-3.1)	0.32
Been told by a doctor that your drinking was worsening any chronic physical health problems like gastritis	1.0 (0.5-1.8)	0.8 (0.3-2.0)	1.2 (0.4-3.1)	0.73
Drinking contributed to long-lasting mood problems (eg, depression)	0.9 (0.5-1.8)	1.2 (0.5-2.4)	0.6 (0.1-2.3)	0.50
Had an adverse reaction with medications you were taking	0.8 (0.4-1.7)	1.0 (0.4-2.2)	0.6 (0.1-2.3)	0.72
Gambled more than usual after drinking	0.5 (0.2-1.3)	0.8 (0.3-2.0)	0.0	0.17
Had reproductive/sexual or pregnancy-related problems after drinking	0.2 (0.1-0.8)	0.3 (0.1-1.3)	0.0	0.54
Had to go to the hospital or emergency room after drinking	0.1 (0.01-0.7)	0.0	0.3 (0.04-0.2)	0.36
Used drugs (such as ecstasy) after drinking	0.1 (0.01-0.7)	0.2 (0.02-1.2)	0.0	1.00
Any health harms	15.7 (13.5-18.2)	16.1 (13.4-19.3)	15.0 (11.5-19.2)	0.64
Work-related harm				
Missed work/school or came in late the day after drinking	6.4 (5.0-8.2)	7.1 (5.3-9.4)	5.3 (3.3-8.2)	0.28
Had poorer performance/productivity, or got yelled at work or school after drinking	1.8 (1.1-2.9)	2.1 (1.2-3.7)	1.2 (0.4-0.3)	0.29
Felt drinking harmed career/studies	1.7 (1.0-2.7)	2.0 (1.1-3.4)	1.2 (0.4-0.3)	0.44
Had an injury at work/school after drinking	0.3 (0.1-1.0)	0.5 (0.2-1.5)	0.0	0.56
Drinking contributed to personal conflicts at work/school	0.1 (0.01-0.7)	0.2 (0.02-1.2)	0.0	1.00
Any work-related harms	7.5 (6.0-9.3)	8.4 (6.4-10.9)	5.9 (3.8-8.9)	0.16
Friendship and social network harm				
Did something very embarrassing after drinking that caused regret	4.3 (3.2-5.8)	4.3 (2.9-6.2)	4.4 (2.7-7.2)	0.93
Felt drinking harmed any of close friendships	1.7 (1.0-2.7)	2.0 (1.1-3.4)	1.2 (0.4-3.1)	0.44
Felt drinking harmed social life	1.5 (0.9-2.5)	2.1 (1.2-3.7)	0.3 (0.04-2.1)	0.02
Had a romantic/sexual encounter after drinking that caused regret later	1.2 (0.6-2.1)	1.3 (0.7-0.3)	0.9 (0.3-2.7)	0.76
Any social network harms	6.6 (5.2-8.4)	7.4 (5.6-9.8)	5.3 (3.3-8.2)	0.21
Public harm				
Got verbally harassed or yelled at in public after drinking	2.8 (2.0-4.1)	3.6 (2.4-5.4)	1.5 (0.6-3.5)	0.06
Felt unsafe in public places (eg, street or public transportation)	1.8 (1.1-2.9)	1.3 (0.7-2.6)	2.6 (1.4-5.0)	0.15
Had your property/personal belongings damaged/stolen while drinking	1.1 (0.6-1.9)	1.3 (0.7-2.6)	0.6 (0.1-2.3)	0.51
Been physically harassed, hit/pushed or injured after drinking	0.3 (0.1-1.0)	0.3 (0.1-1.3)	0.3 (0.04-0.2)	1.00
Been sexually harassed or inappropriately touched after you drank	0.2 (0.1-0.8)	0.2 (0.02-1.2)	0.3 (0.04-2.1)	1.00
Paid fines or got arrested after drinking	0.1 (0.01-0.7)	0.2 (0.02-1.2)	0.0	1.00
Been involved in a traffic accident after drinking	0.1 (0.01-0.7)	0.2 (0.02-1.2)	0.0	1.00
Any public harms	4.1 (3.0-5.6)	4.4 (3.1-6.4)	3.5 (2.0-6.1)	0.49
Family harms				
Had verbal argument with family/got yelled at home after drinking	2.1 (1.4-3.2)	2.6 (1.6-4.3)	1.2 (0.4-3.1)	0.16
Felt that it contributed to long-term bad feelings with family or caused disharmony in home-life	1.1 (0.6-1.9)	1.3 (0.7-2.6)	0.6 (0.1-2.3)	0.51
Been involved in physical argument at home after drinking	0.8 (0.4-1.7)	1.2 (0.5-2.4)	0.3 (0.04-2.1)	0.27
Felt that drinking interfered with family roles (eg, being a parent or sibling)	0.5 (0.2-1.3)	0.5 (0.2-1.5)	0.6 (0.1-2.3)	1.00
Any family harms	3.2 (2.2-4.5)	4.1 (2.8-6.0)	1.5 (0.6-3.5)	0.03

* Data are presented as % (95% confidence interval)

TABLE I. (cont'd)

Alcohol-related harm	Overall (n=949)*	Male (n=608)*	Female (n=341)*	P value
Financial harms				
Drinking contributed to any financial harms	0.1 (0.01-0.7)	0.0	0.3 (0.04-0.2)	0.36
Any first-hand harm	21.2 (18.7-23.9)	21.7 (18.6-25.2)	20.2 (16.3-24.9)	0.59
Second-hand harm	n=3200	n=1418	n=1720	
Public harm				
Been inconvenienced by drunks vomiting, urinating or littering	9.2 (8.2-10.2)	10.3 (8.8-11.9)	8.2 (7.0-9.6)	0.04
Felt unsafe in public places (eg street or MTR)	5.6 (4.8-6.4)	5.9 (4.8-7.2)	5.3 (4.4-6.5)	0.52
Been kept awake at night or disturbed by drinkers	5.2 (4.4-6.0)	5.4 (4.4-6.7)	4.9 (4.0-6.1)	0.56
Been verbally harassed by drinkers in public	2.7 (2.2-3.3)	3.7 (2.9-4.8)	1.7 (1.2-2.5)	0.001
Had property/personal belongings damaged/stolen by drinker	0.5 (0.3-0.9)	1.0 (0.6-1.7)	0.1 (0.03-0.5)	<0.001
Been physically harassed, hit/pushed, or injured	0.5 (0.3-0.9)	0.9 (0.5-1.5)	0.2 (0.1-0.6)	0.01
Been involved in a traffic accident when someone else had been drinking	0.3 (0.1-0.5)	0.6 (0.3-1.2)	0.0	0.001
Been sexually harassed or inappropriately touched	0.3 (0.1-0.5)	0.3 (0.1-0.7)	0.2 (0.1-0.6)	0.83
Had to call the police or go to court because of some stranger's drinking	0.2 (0.1-0.4)	0.4 (0.2-0.9)	0.0	0.001
Any public harms	12.9 (11.8-14.1)	14.1 (12.4-15.9)	11.9 (10.5-13.5)	<0.001
Friendship and social network harm				
Had to go out of the way to help drunk friends	5.7 (4.9-6.5)	7.6 (6.3-9.0)	4.0 (3.2-5.1)	<0.001
Others' drinking harmed close friendships	2.1 (1.7-2.7)	3.1 (2.3-4.1)	1.2 (0.8-1.9)	<0.001
Others' drinking harmed the social life	1.8 (1.3-2.3)	2.6 (1.9-3.6)	1.0 (0.6-1.2)	0.001
Any social network harms	6.7 (5.8-7.6)	9.1 (7.8-10.7)	4.5 (3.6-5.6)	<0.001
Family harm				
Had worries or stress about the drinking behaviours of family members/relatives	3.8 (3.2-4.5)	4.3 (3.3-5.4)	3.4 (2.6-4.3)	0.19
Had to take care of any family/relatives who drank too much	2.6 (2.1-3.2)	3.2 (2.4-4.3)	2.0 (1.5-2.8)	0.03
Been involved in an argument, been yelled at or had to intervene in an argument at home after a family/relative was drinking	1.4 (1.1-1.9)	1.8 (1.2-2.6)	1.2 (0.8-1.8)	0.16
Family member's drinking caused major embarrassment/loss of face	1.4 (1.0-1.8)	2.0 (1.4-2.8)	0.9 (0.5-1.4)	0.01
Other people's drinking ever caused problems with own family members	1.2 (0.9-1.6)	1.5 (1.0-2.2)	0.9 (0.6-1.5)	0.15
Drinking of family member contributed to financial or legal problems	0.4 (0.2-0.7)	0.5 (0.3-1.1)	0.2 (0.1-0.6)	0.25
Been physically harassed, hit/pushed or suffered injury after a family member had been drinking (including drink-driving)	0.4 (0.2-0.7)	0.7 (0.4-1.3)	0.1 (0.02-0.5)	0.02
Any family harm	5.2 (4.5-6.0)	6.0 (4.9-7.4)	4.5 (3.6-5.6)	<0.001
Work-related harm				
Lost productivity due to drinkers at work/school	1.1 (0.8-1.6)	1.6 (1.1-2.4)	0.7 (0.4-1.2)	0.02
Experienced any type of mental stress from drinkers at work/school	0.6 (0.4-1.0)	1.1 (0.7-1.8)	0.2 (0.1-0.6)	0.003
Incurred job/school-related problems from drinking of others	0.6 (0.4-1.0)	1.1 (0.7-1.8)	0.2 (0.1-0.5)	0.001
Had financial losses due to other people's drinking at work/school	0.4 (0.3-0.7)	0.7 (0.4-1.3)	0.2 (0.1-0.5)	0.03
Got into personal conflicts at work/school from other's drinking	0.3 (0.2-0.6)	0.5 (0.3-1.1)	0.1 (0.03-0.5)	0.05
Had physical injury from drinkers at work/school	0.3 (0.2-0.6)	0.7 (0.4-1.3)	0.1 (0.01-0.4)	0.004
Any work-related harm	1.9 (1.6-2.4)	2.8 (2.1-3.8)	1.0 (0.7-1.7)	<0.001
Any second-hand harm	18.2 (16.9-19.5)	20.4 (18.4-22.5)	16.3 (14.6-18.1)	<0.001

The lifetime and past-year prevalence of alcohol-related harms was reported as percentages with 95% confidence interval (CI) by sex. Univariable logistic regression was conducted to identify factors associated with past-year experience of any first-hand and second-hand harms. Variables with a P value of <0.20 were included in the stepwise multivariable logistic regression. Neighbourhood alcohol outlet density was calculated by dividing the number of alcohol outlet licences within the respondent's secondary planning unit by the total population in the unit. Statistical significance was set at $P < 0.5$.

Results

A total of 1480 men and 1720 women were included. The sample is comparable to Hong Kong general population in terms of sex, age, and district of residence.⁵ The prevalence of ever and past-year drinkers was 61.6% and 41.1% among men and 31.6% and 19.8% among women, respectively (Table 1). The prevalence of past-year binge drinkers was 9.0% among men and 2.4% among women, whereas 16.5% of men and 4.7% of women drank at least weekly.

First-hand harms

Of past-year drinkers, 54.3% and 21.2% reported having experienced first-hand harms in their lifetime and in past year, respectively. The most common ones were health harms such as hangover (12.1%) and blackouts (4.7%), work-related harms such as absenteeism (6.4%), social network harms such as doing something embarrassing (4.3%). The least common harms were public harms and family-related harms.

Binge drinking, weekly drinking, and alcohol use disorder were associated with significantly higher risk of experiencing first-hand harms in past year (Table 2). In multivariable analysis, younger drinkers reported to have experienced significantly more first-hand harms (adjusted odds ratio [aOR]=2.64, 95% CI=1.63-4.28), particularly in health, work, and social network harms (aOR=1.92-6.80, $P < 0.05$). Compared with married drinkers, single drinkers reported to have experienced significantly more public harms (aOR=2.25, 95% CI=1.12-4.52). Higher education attainment was independently associated with family harms (aOR=8.35, 95% CI=2.78-25.14) and social network harms (aOR=3.59, 95% CI=1.57-8.20). Sex, communal living, and work-related drinking were not associated with first-hand harms after adjusting for socio-demographic and drinking-related factors. Neighbourhood alcohol outlet density was not associated with any first-hand harms.

Second-hand harms

Of respondents, 45.3% and 18.2% reported to have had lifetime and past-year experience of second-hand harms, respectively. The most common ones were public harms such as being inconvenienced by drinkers (9.2%), feeling unsafe in public (5.6%), and sleeping disturbance (5.2%), followed by having to help drunk friends (5.7%) and stress about family member's drinking (3.8%) [Table 1]. Work-related harms were the least common (2.3%).

In multivariable analysis, experience of any second-hand harm in the past year was independently associated with younger age, higher education attainment, past-year drinking, and communal living (aOR=1.35-4.30, $P < 0.05$, Table 3). Any past-year drinking, especially binge drinking, increased the risk for all categories of second-hand harms (aOR=1.63-14.28, $P < 0.05$), whereas having higher education and communal living arrangements were independently associated with family and social network harms only. Neighbourhood alcohol outlet density was not associated with any second-hand harm, except being inconvenienced by inebriated bar patrons.

Perception on neighbourhood alcohol outlet regulation

38.4% of respondents supported reducing alcohol-serving hours, whereas only 4.2% of respondents supported reducing the number of neighbourhood alcohol outlets. However, 93.3% considered that there was no need to change. Those with past-year experience of any second-hand harms were significantly more supportive for reducing outlet density (OR=3.36, 95% CI=2.35-4.79).

Discussion

In Hong Kong, despite the low alcohol consumption culture, 18.2% of adults reported to have experienced second-hand harms in past year, whereas 21.2% of past-year drinkers reported to have experienced first-hand harms in past year. Although severe alcohol-related harms such as assault are uncommon, moderate levels of harms such as public inconveniences and lowered work productivity suggest a need for regular monitoring of these harms. Given the extremely low public support for regulating serving hours and density of alcohol outlets, future policy actions may target high-risk drinkers such as younger drinkers and binge drinkers by considering happy-hour restrictions and minimum pricing regulations. As public disturbances are the most common harm, further regulation on on- and off-premises license

TABLE 2. Factors associated with experiencing at least one first-hand harm in the past year (n=949)

	Any health harm		Any work-related harm	
	Univariable analysis [†]	Multivariable analysis [‡]	Univariable analysis [†]	Multivariable analysis [‡]
Sex				
Male	1.00	-	1.00	-
Female	0.92 (0.63-1.32)	-	0.68 (0.40-1.16)	-
Age, y				
55-74	1.00	1.00	1.00	1.00
35-54	0.85 (0.48-1.48)	0.82 (0.46-1.47)	1.03 (0.41-2.59)	0.94 (0.36-2.46)
18-34	1.94 (1.17-3.21)*	1.92 (1.15-3.22)*	3.31 (1.47-7.45)*	3.77 (1.63-8.75)*
Marital status				
Currently married	1.00	-	1.00	-
Single, never married	2.01 (1.39-2.89)*	-	3.18 (1.84-5.47)*	-
Divorced/widowed/separated	1.42 (0.47-4.29)	-	-	-
Education				
Secondary or less	1.00	-	1.00	-
Upper secondary non-degree	0.99 (0.54-1.84)	-	2.22 (1.06-4.69)*	-
University or above	1.21 (0.93-1.76)	-	1.56 (0.90-2.71)	-
Employment				
Unemployed	1.00	-	1.00	-
Employed	0.79 (0.55-1.15)	-	0.92 (0.55-1.54)	-
Monthly household income, HK\$				
<25 000	1.00	-	1.00	-
25 000-49 999	0.95 (0.62-1.45)	-	1.52 (0.86-2.69)	-
≥50 000	0.74 (0.47-1.16)	-	0.59 (0.29-1.19)	-
Binge drinking	3.58 (2.44-5.26)*	3.23 (2.17-4.80)*	4.50 (2.73-7.42)*	2.36 (1.30-4.28)*
Weekly drinking	1.96 (1.37-2.79)*	-	3.25 (1.98-5.33)*	2.46 (1.35-4.46)*
Alcohol use disorder	2.93 (1.70-5.05)*	2.34 (1.31-4.16)*	5.74 (3.13-10.53)*	4.61 (2.38-8.94)*
Communal living	1.00 (0.38-2.64)	-	2.44 (0.91-6.56)	-
Work-related drinking	1.34 (0.75-2.38)	-	1.60 (0.64-3.35)	-
Alcohol outlet density in area of residence (by population)	0.97 (0.92-1.02)	-	0.88 (0.69-1.11)	-

* P<0.05

† Data are presented as odds ratio (95% confidence interval)

‡ Data are presented as adjusted odds ratio (95% confidence interval)

condition should be considered. The general public and policy makers should give more consideration to the extensive external effects of alcohol use and should facilitate social welfare to provide services to victims of first-hand and second-hand harms of alcohol consumption, as family harms (emotional stress from the drinking of family members) was most common.

There are limitations to this study. Our findings cannot directly compare with those of previous studies, as there is no international consensus on instruments to measure alcohol-related harms.

Our questionnaire was developed for exploratory purpose and requires validation. The perception of harms is subjective. Our findings are prone to information bias from self-reported data. The slight over-representation of the non-working population in our sample may result in an underestimation of workplace harms prevalence. We did not ask about the perpetrator or context of second-hand harms, which warrants further research. Although respondents' support for regulating alcohol outlets was evaluated, more evidence on public opinion is needed to inform future alcohol policy.

Any public harm		Any family harm		Any social network harm		Any first-hand harm	
Univariable analysis [†]	Multivariable analysis [‡]	Univariable analysis [†]	Multivariable analysis [‡]	Univariable analysis [†]	Multivariable analysis [‡]	Univariable analysis [†]	Multivariable analysis [‡]
1.00	-	1.00	-	1.00	-	1.00	-
0.78 (0.39-1.57)	-	0.35 (0.14-0.91)*	-	0.70 (0.40-1.22)	-	0.91 (0.66-1.27)	-
1.00	-	1.00	-	1.00	1.00	1.00	1.00
0.68 (0.23-1.98)	-	0.92 (0.30-2.79)	-	2.09 (0.58-7.50)	1.67 (0.45-6.24)	0.98 (0.59-1.64)	0.97 (0.57-1.64)
1.82 (0.73-4.52)	-	1.37 (0.50-3.81)	-	7.55 (2.32-24.57)*	6.80 (1.99-23.28)*	2.49 (1.56-3.96)*	2.64 (1.63-4.28)*
1.00	1.00	1.00	-	1.00	-	1.00	-
2.50 (1.25-4.99)*	2.25 (1.12-4.52)*	2.31 (1.04-5.17)*	-	3.90 (2.11-7.18)*	-	2.44 (1.75-3.39)*	-
-	-	4.33 (0.89-21.17)	-	2.76 (0.59-12.8)	-	2.25 (0.91-5.57)	-
1.00	-	1.00	1.00	1.00	1.00	1.00	-
2.67 (1.11-6.43)*	-	7.59 (2.95-19.56)*	8.35 (2.78-25.14)*	5.12 (2.37-11.02)*	3.59 (1.57-8.20)*	1.63 (0.98-2.69)	-
1.10 (0.53-2.29)	-	1.20 (0.45-3.19)	1.50 (0.49-4.63)	2.29 (1.19-4.40)*	1.49 (0.73-3.03)	1.27 (0.90-1.78)	-
1.00	-	1.00	-	1.00	-	1.00	-
0.78 (0.40-1.53)	-	0.65 (0.31-1.38)	-	0.70 (0.41-1.19)	-	0.83 (0.60-1.16)	-
1.00	-	1.00	1.00	1.00	-	1.00	-
1.71 (0.79-3.69)	-	0.55 (0.24-1.24)	0.28 (0.10-0.75)*	0.97 (0.51-1.84)	-	1.14 (0.78-1.66)	-
0.68 (0.27-1.76)	-	0.36 (0.14-0.95)*	0.19 (0.06-0.59)*	1.11 (0.58-2.11)	-	0.73 (0.49-1.10)	-
3.29 (1.70-6.36)*	3.03 (1.55-5.90)*	3.57 (1.70-7.50)*	-	3.00 (1.75-5.13)*	2.43 (1.34-4.40)*	3.17 (2.22-4.52)*	2.34 (1.55-3.55)*
2.09 (1.10-3.97)*	-	3.46 (1.63-7.36)*	3.38 (1.45-7.88)*	2.09 (1.25-3.49)*	-	1.87 (1.36-2.56)*	1.47 (1.00-2.15)*
2.53 (1.02-6.27)*	-	14.28 (6.62-30.81)*	12.95 (5.33-31.33)*	7.53 (4.08-13.88)*	6.13 (3.09-12.14)*	3.17 (1.90-5.28)*	2.57 (1.49-4.43)*
-	-	2.10 (0.48-9.20)	-	4.26 (1.77-10.28)*	-	2.01 (0.95-4.23)	-
1.22 (0.42-3.52)	-	2.77 (1.10-6.99)*	-	1.86 (0.88-3.91)	-	1.41 (0.84-2.36)	-
0.48 (0.21-1.11)	-	0.99 (0.93-1.06)	-	0.98 (0.93-1.04)	-	0.96 (0.90-1.02)	-

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1. Yu J, Sumerlin TS, Goggins WB, Dong D, Chung RY, Kim JH. First- and second-hand alcohol-

related harms among urban Chinese: a population-based study from Hong Kong. *Drug Alcohol Rev* 2022;41:208-20.

References

1. World Health Organization. Global Status Report on Alcohol and Health 2018. Geneva; 2018.
2. Department of Health, The Government of Hong Kong SAR. Alcohol Consumption Per Capita in Hong Kong. Available from: https://www.change4health.gov.hk/en/alcohol_aware/figures/alcohol_consumption/index.html
3. Chung VC, Yip BH, Griffiths SM, et al. The impact of cutting alcohol duties on drinking patterns in Hong Kong. *Alcohol Alcohol* 2013;48:720-8.

TABLE 3. Factors associated with experiencing at least one second-hand harm in the past year (n=3200)

	Any work-related harm		Any public harm		Any family harm		Any social network harm		Any second-hand harm	
	Univariable analysis†	Multivariable analysis‡	Univariable analysis†	Multivariable analysis‡	Univariable analysis†	Multivariable analysis‡	Univariable analysis†	Multivariable analysis‡	Univariable analysis†	Multivariable analysis‡
Sex										
Male	1.00	-	1.00	-	1.00	-	1.00	-	1.00	-
Female	0.36 (0.21-0.63)*	-	0.83 (0.67-1.02)	-	0.73 (0.54-1.00)	-	0.47 (0.35-0.63)*	-	0.76 (0.64-0.91)*	-
Age, y										
55-74	1.00	-	1.00	1.00	1.00	-	1.00	-	1.00	1.00
35-54	1.49 (0.73-3.02)	-	1.58 (1.19-2.08)*	1.43 (1.07-1.92)*	1.01 (0.67-1.53)	-	1.44 (0.95-2.18)	-	1.59 (1.24-2.03)*	1.35 (1.03-1.77)*
18-34	2.22 (1.12-4.43)*	-	2.16 (1.64-2.85)*	1.73 (1.28-2.34)*	1.72 (1.17-2.54)*	-	3.29 (2.24-4.83)*	-	2.74 (2.15-3.49)*	1.85 (1.40-2.44)*
Marital status										
Currently married	1.00	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	-
Single, never married	2.39 (1.40-4.09)*	1.25 (0.70-2.24)	1.71 (1.38-2.11)*	-	1.93 (1.40-2.66)*	1.17 (0.82-1.68)	3.12 (2.33-4.18)*	1.54 (1.12-2.13)*	2.02 (1.68-2.43)*	-
Divorced/widowed/separated	4.13 (1.55-11.02)*	4.41 (1.58-12.29)*	0.98 (0.52-1.87)	-	2.61 (1.31-5.20)*	2.75 (1.35-5.62)*	3.51 (1.88-6.54)*	4.06 (2.07-7.97)*	1.08 (0.63-1.87)	-
Education										
Secondary or less	1.00	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	1.00
Upper secondary non-degree	5.20 (2.66-10.15)*	4.22 (2.06-8.67)*	1.50 (1.04-2.17)*	-	4.57 (2.99-6.99)*	3.59 (2.28-5.66)*	3.52 (2.23-5.56)*	2.53 (1.54-4.14)*	2.17 (1.60-2.94)*	1.58 (1.13-2.20)*
University or above	2.27 (1.26-4.10)*	1.64 (0.86-3.16)	1.87 (1.50-2.34)*	-	2.20 (1.54-3.12)*	1.46 (0.98-2.17)	4.36 (3.19-5.96)*	2.58 (1.80-3.70)*	2.43 (2.00-2.96)*	1.41 (1.11-1.80)*
Employment										
Unemployed	1.00	-	1.00	-	1.00	-	1.00	-	1.00	-
Employed	1.62 (0.95-2.75)	-	1.456 (1.18-1.79)*	-	1.63 (1.18-2.25)*	-	1.78 (1.33-2.38)*	-	1.62 (1.35-1.94)*	-
Monthly household income, HK\$										
<25 000	1.00	-	1.00	1.00	1.00	-	1.00	-	1.00	1.00
25 000-49 999	1.42 (0.79-2.56)	-	1.34 (1.05-1.72)*	1.06 (0.82-1.37)	1.22 (0.84-1.77)	-	1.35 (0.97-1.89)	-	1.31 (1.07-1.62)*	0.87 (0.69-1.10)
≥50 000	1.96 (1.01-3.80)*	-	2.51 (1.92-3.29)*	1.72 (1.28-2.30)*	2.78 (1.90-4.08)*	-	3.14 (2.22-4.43)*	-	2.83 (2.24-3.59)*	1.35 (1.02-1.79)*
Past-year drinking status										
Abstainer	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Non-binge drinker	3.46 (1.83-6.53)*	2.80 (1.44-5.43)*	2.08 (1.66-2.61)*	1.63 (1.28-2.09)*	3.56 (2.52-5.01)*	2.85 (1.97-4.11)*	6.11 (4.38-8.52)*	4.23 (2.97-6.01)*	3.07 (2.52-3.75)*	2.32 (1.86-2.89)*
Binge drinker	16.92 (8.83-32.42)*	14.28 (7.27-28.07)*	3.27 (2.27-4.70)*	2.63 (1.81-3.83)*	6.68 (4.18-10.67)*	5.29 (3.23-8.67)*	15.40 (10.11-34.44)*	12.04 (7.76-18.69)*	5.60 (4.04-7.75)*	4.30 (3.05-6.06)*
Communal living	4.86 (1.69-14.00)*	-	1.97 (1.00-3.88)	-	4.14 (1.97-8.68)*	2.43 (1.11-5.30)*	5.20 (2.71-9.96)*	2.22 (1.10-4.52)*	3.72 (2.11-6.59)*	2.03 (1.11-3.72)*
Work-related drinking	6.37 (2.92-13.89)*	-	1.66 (0.95-2.90)	-	4.34 (2.42-7.77)*	-	4.55 (2.67-7.48)*	-	2.40 (1.51-3.83)*	-
Alcohol outlet density in area of residence (by population)	1.00	-	1.01 (1.00-1.03)	-	1.01 (0.99-1.03)	-	1.00 (0.98-1.03)	-	1.01 (1.00-1.02)	-

* P<0.05

† Data are presented as odds ratio (95% confidence interval)

‡ Data are presented as adjusted odds ratio (95% confidence interval)

- Department of Health, The Government of Hong Kong SAR. Action Plan to Reduce Alcohol-Related Harm in Hong Kong; 2013.
- Census and Statistics Department, The Government of Hong Kong SAR. 2016 Population By-Census. Available from: <https://www.censtatd.gov.hk/hkstat/sub/sp459.jsp>