Cross-boundary Substance Uses Among Hong Kong Chinese Young Adults

Joseph T. F. Lau, Hi Yi Tsui, Lawrence T. Lam, and Mason Lau

ABSTRACT The study documents the characteristics of Hong Kong residents who used substances in mainland China. Characteristics of such users were compared with those using substances elsewhere. A cross-sectional survey was used. Data analyses were stratified by gender, and multivariate analyses were performed. Respondents, Hong Kong adults aged 18-30 (n=6,528), were interviewed using a mixed interviewer and computerized mobile phone method, at the Hong Kong-mainland China boundary. Cross-border substance users and other types of substance users had characteristics that were quite different (e.g., education level, perceived harmfulness of substance use in general, having friends who frequently used substances in mainland China). Crossboundary substance users also found it easier to obtain substances in mainland China than in Hong Kong (males: 60.5%, females: 39.6%) and perceived no chance of being arrested in mainland China because of substance use (men: 28.8%, women: 24.5%). They tended to use substances in discos/rave parties together with friends (men: 77%, women: 81%), and substances were often obtained for free (men: 63.2%, women: 78%). Ecstasy and ketamine were often used (men: 86.5% & 79.4%, women: 81% & 70.2%), and multiple uses of different substances were common (men: 81.3%, women: 68.6%). Lower price, peer influence, and better availability were reasons behind crossboundary substance use behaviors. Cross-boundary substance users have specific characteristics. Prevention policies should take these characteristics into account. Regional collaborations are highly warranted.

KEYWORDS Chinese, Cross-boundary, Substance use, Young adults.

INTRODUCTION

Substance use behavior is one of the various forms of cross-boundary risk behaviors.¹⁻³ There are relatively few studies conducted on cross-boundary substance use behaviors, although the spread of disease such as human immunodeficiency virus (HIV) via cross-border injecting drug use or use of psychoactive substances has been a growing concern.^{1-3,4-6} Cross-boundary substance users may have some special characteristics that are relevant to drug prevention. For instance, as compared to their "stay home" counterparts, traveler abusers were more likely to find drugs less expensive and more readily available; they also tended to be older, became addicted more easily, and were more likely to seek treatments.⁷

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Hong Kong is geographically contiguous with Shenzhen and is a special administrative region of mainland China. In the year 2003, Hong Kong residents made 52.6 million person-trips to mainland China, representing an increase of 34.3% as compared to the figure in 1998 (39.1 million).⁸ Cross-boundary risk behaviors among Hong Kong residents in mainland China have been prevalent. Studies have consistently found that many male Hong Kong residents were engaging in unprotected sex with female sex workers (FSW) in mainland China.^{9,10} Furthermore, Hong Kong male residents were more likely to engage in unprotected sex with FSW in mainland China, as compared to when having sex with FSW in Hong Kong.¹¹ Similar results were also obtained from studies of cross-boundary homosexual behaviors.¹²

Studies related to Hong Kong people using substances in mainland China, however, have not been reported.

It has consistently been found that substance use has been common among the youth.^{13–17} In Hong Kong, a large-scale drug use survey conducted in year 2000 on 95,788 secondary school students found that 4.1% of them had used some psychotropic substances in their lifetime (as compared to 2.7% in 1996).¹⁸ Another local survey reported the prevalence of using psychoactive substances in the last year among those aged between 18 and 24 to be 9.3 and 5.5% for men and women, respectively.¹⁹ Results also showed that 26% of those men aged 18–25 and 78.6% of those aged 26–35 who had used substances in the last 6 months reported having done so in mainland China.¹⁹ Among adolescents who had ever used any substances, around 14% would use substances in entertainment establishments in mainland China.¹⁸ Gender differences in prevalence of substance use and associated factors were reported in a number of studies.^{20,21}

The present study compared the characteristics/behaviors of the sampled substance users versus the nonusers and those substance users who used substances in or outside mainland China in the last year. The study also investigated patterns and perceptions related to substance use in mainland China (e.g., history of substance use in mainland China, perceived accessibility of substances and chances of being arrested in mainland China because of substance use, reasons for using substances in mainland China, types of substances used in mainland China, and venues, sources, and companions involved when using substances in mainland China).

METHODS

Study Population and Data Collection

The study population comprised Hong Kong Chinese young adults of age 18 to 30 traveling to mainland China. With verbal informed consent, respondents were interviewed when they returned to Hong Kong from mainland China, at the exit areas of the Lo Wu checkpoint inside the Lo Wu Kowloon–Canton Railway station, during 18 November through 17 December 2002 (10 A.M. to 7 P.M.). Prospective respondents were confirmed not to have previously participated in the study. Interviewers were instructed to approach the tenth adult person exiting from the customs area after an arbitrary index adult person exiting the area was spotted. There were, however, practical difficulties in implementing this method in a strict sense so that the sampling method should be regarded as nonrandom. The study has been approved by the Research Ethics Committee of the Chinese University of Hong Kong.

The study used a special data collection method that had two parts. The first part consisted of an anonymous face-to-face interview, which included eight nonsensitive questions (e.g., age, education level, number of days staying over in mainland China in the last month, perceived addictiveness and harmfulness of substance use in general). This part aimed at establishing rapport with the respondents and facilitating the subsequent asking of more sensitive questions. It took about 3 to 5 min to complete. After completing Part I, respondents were briefed that Part II of the questionnaire would cover some sensitive questions.

Respondents were then provided with a mobile telephone and were briefed that the questions were prerecorded in a computerized phone system and that they only needed to key in their responses after listening to the questions. Respondents were assured that the survey was anonymous, and their responses would be unknown to the interviewers and were encouraged to give true answers. With consent, they were connected via the mobile phone to a service line to continue with the second part of the interview. The respondents listened to the digitized questionnaire and keyed in their corresponding responses while the interviewers kept a distance from them. Upon completion, respondents returned the mobile phone to the research staff without revealing their identity. They were assured of anonymity and confidentiality. This specially designed computerized data collection method has been demonstrated to give higher prevalence of risk behaviors as compared to conventional means of data collection (e.g., face-to-face interviews).^{22,23} The higher frequency of risk behaviors reported by this method may be because of its ability to increase the sense of confidentiality (responses known to no one) and, hence, to reduce reporting bias because of social desirability.^{22,23} The method has also been applied in a number of other local studies.^{9,10,24}

A total of 11,479 individuals were contacted; 6,528 answered questions in both Part I and Part II of the study and 6,420 completed the entire survey. "Being in a rush" was the most commonly given reason for refusal, and most of the refusals were given before the topic of the study was revealed to the approached person. The refusal rate was therefore 43.1%. The overall response rate, defined as the number of respondents who completed the survey divided by the total number of individuals contacted, was about 56%.

Measurements

Part I of the Questionnaire Sociodemographic data were collected. Respondents were asked about their number of days staying over in mainland China in the last month, perceived addictiveness of substance use, and perceived harmfulness of using substances to health in general.

Part II of the Questionnaire Respondents were asked whether they had used some substances such as ecstasy, ketamine, cannabis, methylamphetamine, heroin, etc. in the last year (in any places). Respondents who used such substances in the last year (n=1,575) were asked about their frequency of substance use in the last month (none, one to two times, three to ten times, or more than ten times), location of substance use in the last year, whether they could quit using substances at any time, whether they perceived that taking substances has severe negative impacts on their own physical health, and whether they had friends frequently using substances in mainland China.

Those who reported having used substances in mainland China in the last year (n=1,289) were asked the types of substance used in mainland China. They were asked about details related to their last episode of substance use in mainland China, when they first used substances in mainland China, their main reason for using substances in mainland China, and relevant perceptions related to substance use in mainland China.

Statistical Analyses

The analyses were stratified by gender. Respondents were divided into two groups: those substance users who used substances in mainland China in the last year (PSC) and those substance users who had not used substances in mainland China in the last year (i.e., those who used substances only in places other than mainland China [PSNC]). Characteristics of substance users versus nonusers were compared by chi-square test. Characteristics of the PSC and PSNC groups were also compared by chi-square test. In addition, their sociodemographic characteristics were compared by univariate odds ratios (respective 95% confidence intervals were also presented). The other characteristics related to substance use were compared by adjusted odds ratios obtained from multivariate logistic regression models (adjusting for age, education level, employment status, monthly income, and number of days stay-over in mainland China in the last month, using the 'ENTER' option). Within the PSC group, gender differences in the studied variables were compared by chi-square test. A *p* value<0.05 was considered statistically significant. All statistical analyses were conducted with SPSS for Windows (version 11.01).

RESULTS

Comparing Sociodemographic Characteristics of Substance Users Versus Nonusers

Of all 5,227 male (80.1%) and 1,301 female (19.9%) respondents, respectively, 1,405 men (26.9%) and 170 women (13.1%) reported having used substances in the last year. The background characteristics of these sampled substance users and substance nonusers are compared in Table 1. Substance users were more likely than nonusers to be younger, less educated, being unemployed, having a lower level of income, and having spent more days staying over in mainland China in the last months (p<0.05). Such were true for both male and female respondents (Table 1).

Comparing Sociodemographic Characteristics of the PSC and PSNC Groups

The sociodemographic profiles of the PSC and PSNC groups, stratified by gender, are summarized in Table 2. It is seen that, for both men and women, the two groups did not differ significantly in terms of age and monthly income distributions (p>0.05). For both men and women, the PSC group as compared to the PSNC group, however, tended to have attained a lower education level and had spent more days staying over in mainland China (p<0.05). For men, but not women, PSC were less likely than PSNC to be students (p<0.05).

It is also noted that high percentages of female PSC were of age 20 or less (60.7%), unemployed (24%), students (10.7%), and without a monthly income (35.5%). Such percentages were higher than those of their male counterparts (p<0.05 by chi-square test, statistics were not shown in Table 2).

			Male					Female		
	Substance	e users (<i>n</i> =1,405)	Nonuser	s (n=3,822)	χ^{2}	Substance	users (<i>n</i> =170)	Nonusers	s (<i>n</i> =1,131)	χ^{2}
	%	(<i>u</i>) ^a	%	(<i>n</i>) ^a	<i>p</i> value	%	(<i>n</i>) ^a	%	(<i>n</i>) ^a	<i>p</i> value
Age					<0.001					<0.001
18-20	35.6	(200)	22.9	(875)		55.9	95	30.3	342	
21–25	41.9	(588)	40.8	(1,9)		35.9	61	39.5	446	
26–30	22.6	(317)	36.3	(1, 388)		8.2	14	30.3	342	
Education level				<0.001						<0.001
University or above	7.2	(101)	26.6	(1016)		11.9	(20)	34.5	(390)	
Form 6–7	5.4	(26)	9.7	(369)		7.7	(13)	13.1	(148)	
Form1–5	83.7	(1175)	61.9	(2, 366)		79.8	(134)	51.4	(581)	
Primary or below	3.7	(52)	1.8	(20)		0.6	(1)	1.1	(12)	
Employment status					<0.001					<0.001
Unemployed	16.4	(230)	8.1	(309)		20.2	(34)	8.5	(96)	
Part-time job	5.8	(81)	4.5	(172)		6.0	(10)	4.8	(54)	
Full-time job	71.4	(1,003)	77.0	(2941)		56.5	(95)	65.7	(743)	
Student	4.4	(62)	9.1	(347)		12.5	(21)	19.0	(215)	
Others	2.0	(28)	1.4	(52)		4.8	(8)	2.0	(23)	

TABLE 1 Sociodemographic characteristics of substance users (used substances in any place in the last year) versus nonusers

Monthly income (in HK\$) ^b					<0.001					<0.05
None	19.6	(272)	16.0	(608)		32.3	(54)	27.4	(309)	
\$5000 or below	2.9	(41)	3.8	(146)		8.4	(14)	6.1	(69)	
\$5001-\$10000	40.3	(561)	34.7	(1316)		37.1	(62)	32.6	(368)	
\$10001-\$20000	32.9	(457)	36.0	(1364)		17.4	(29)	27.5	(311)	
Above \$20000	4.3	(09)	9.5	(360)		4.8	(8)	6.4	(72)	
Number of days stay-over					<0.001					0.001
in mainland China in										
the last month										
None	13.2	(182)	29.0	(1,099)		31.5	(52)	45.5	(511)	
1–3 days	43.8	(605)	37.7	(1,426)		43.0	(71)	31.1	(350)	
4–10 days	21.4	(295)	14.6	(553)		14.5	(24)	9.3	(105)	
Above 10 days	21.6	(298)	18.7	(208)		10.9	(18)	14.1	(158)	
Location of substance										
uses in the last year ^c										
In mainland China	84.3	(1,167)	NA		٩N	73.5	(122)	NA		NA
Other than mainland China	15.7	(217)	NA			26.5	(44)	NA		
AII	26.9	(1,405)	73.1			13.1	(170)	86.9		
NA Not applicable (the question	on was not ask	ed to nonusers)								
^a The counts may not add up to	o the total due	e to the presence o	of some missing	s values						
^b About HK\$ 7.8=US\$ 1										
^c Only substance users were asl	ked the questi	on								

CROSS-BOUNDARY SUBSTANCE USE BEHAVIORS

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					Male					-	emale	
	4	SC	PS	NC			ē.	SC	PSN	lC		
	(<i>n</i> =1	,167)	(u=)	217)		Ilniveriate Odds	= <i>u</i>)	122)	(n =4	14)		Ilniveriate Odds
	%	$(u)^{a}$	%	$(n)^a$	χ^2 p value	ratio(95% CI)	%	$(u)^{a}$	%	$(u)^a$	χ^2 p value	ratio (95% CI)
Age					0.71						0.32	
18–20	35.9	(419)	34.1	(74)		1.00	60.7	(74)	47.7	(21)		1.00
21–25	42.2	(492)	41.5	(06)		0.97 (0.69, 1.35)	33.6	(41)	43.2	(19)		0.61 (0.30, 1.27)
26–30	21.9	(256)	24.4	(23)		0.85 (0.58, 1.25)	5.7	(2)	9.1	(4)		0.50 (0.13, 1.86)
Education level					<0.001						0.04	
University or above	5.7	(99)	14.3	(31)		1.00	7.4	(6)	22.7	(10)		1.00
Form 6–7	5.1	(09)	6.5	(14)		2.01 (0.98, 4.14)	6.6	(8)	9.1	(4)		2.22 (0.50, 9.96)
Form 1–5	85.4	(966)	76.0	(165)		2.84 (1.79, 4.48)***	85.1	(103)	68.2	(30)		3.82 (1.42, 10.25)**
Primary or below	3.8	(44)	3.2	<u>(</u>)		2.95 (1.20, 7.30)*	0.8	(1)	0.0	(0)		NA
Employment status					0.008						0.21	
Unemployed	17.1	(199)	13.8	(30)		1.00	24.0	(29)	11.4	(2)		1.00
Part-time job	5.7	(99)	6.0	(13)		0.77 (0.38, 1.55)	7.4	(6)	2.3	(1)		1.55 (0.16, 14.96)
Full-time job	71.8	(837)	68.2	(148)		0.85 (0.56, 1.30)	53.7	(65)	63.6	(28)		0.40 (0.14, 1.14)
Student	3.9	(45)	7.8	(17)		$0.40 (0.20, 0.79)^{**}$	10.7	(13)	18.2	(8)		0.28 (0.08, 1.02)
Others	1.6	(19)	4.1	(6)		0.32 (0.13, 0.77)*	4.1	(5)	4.5	(2)		0.43 (0.07, 2.87)

TABLE 2 Sociodemographic characteristics of the sampled PSC and PSNC

Monthly income (in HK\$) ^b					0.33						0.68	
None	19.3	(224)	22.0	(47)		1.00	35.5	(43)	25.6	(11)		1.00
\$5000 or below	3.0	(35)	2.8	(9)		1.22 (0.49, 3.08)	8.3	(10)	9.3	(4)		0.64 (0.17, 2.43)
\$5001-\$10000	40.5	(469)	38.8	(83)		1.19 (0.80, 1.75)	37.2	(45)	37.2	(16)		0.72 (0.30, 1.72)
\$10001-\$20000	33.3	(386)	29.9	(64)		1.27 (0.84, 1.91)	14.9	(18)	23.3	(10)		0.46 (0.17, 1.27)
Above \$20000	3.8	(44)	6.5	(14)		0.66 (0.34, 1.30)	4.1	(2)	4.7	(2)		0.64 (0.11, 3.75)
Number of days					<0.001						0.002	
stay-over in mainland												
China in the last month												
None	10.5	(121)	27.0	(57)		1.00	23.1	(27)	52.3	(23)		1.00
1–3 days	43.9	(504)	42.7	(06)		2.64 (1.79, 3.88)***	46.2	(54)	36.4	(16)		2.88 (1.31, 6.32)**
4–10 days	22.6	(260)	15.2	(32)		$3.83(2.36, 6.21)^{***}$	17.1	(20)	9.1	(4)		4.26 (1.27, 14.27)*
Above 10 days	22.9	(263)	15.2	(32)		$3.87(2.39, 6.28)^{***}$	13.7	(16)	2.3	(1)		13.62 (1.68, 110.67)*
PSC People who used subst	ances in I	mainland	China; P	SNC peopl	e who used s	ubstances in places other t	han mair	land Chi	na; NA n	ot applicable		

The counts may not add up to the total due to the presence of some missing values. ^aThe counts may not add up to the total due to the presence of some missing values. ^bAbout HK\$ 7.8=US\$ 1 ***p*<0.01 ***p*<0.01

	2	1en					Won	nen				
		SC	PS	NC			PS	U	PSNC			
	= <i>u</i>)	1,167)	<i>u=u</i>)	217)			(<i>n</i> =1	22)	<i>i=u</i>)	44)		
	%	$(u)^{a}$	%	$(n)^a$	χ^2 p value	Adjusted OR (95% Cl)	%	$(n)^a$	%	$(u)^{a}$	χ^2 p value	Adjusted OR (95% CI)
Frequency of using					<0.001						0.09	
substances in any												
place in the last month												
None	34.2	(399)	56.2	(122)		1.00	34.4	(42)	55.8	(24)		1.00
1–2 Times	37.7	(440)	30.9	(67)		1.75(1.24,2.47)**	38.5	(47)	23.3	(10)		2.94(1.09,7.89)*
3–10 Times	18.3	(214)	7.4	(16)		$3.05(1.73, 5.38)^{***}$	18.0	(22)	11.6	(2)		2.16(0.62,7.54)
>10 Times	9.8	(114)	5.5	(12)		$2.92(1.44, 5.91)^{**}$	9.0	(11)	9.3	(4)		2.03(0.38,11.03)
Having friends who					<0.01						<0.01	
frequently used												
substances in												
mainland China												
No	36.6	(412)	47.6	(101)		1.00	32.4	(36)	60.5	(26)		1.00
Yes	63.4	(713)	52.4	(111)		1.51(1.10, 2.07)*	67.6	(75)	39.5	(17)		3.79(1.61,8.94)**
Taking substances					0.02						0.72	
has severe negative												
impact on one's												
own physical health												

TABLE 3 Comparing substance use-related behaviors and perceptions between PSC and PSNC

е 6	37)	20.7	(44)		1.00	37.3	(41)	41.9	(18)		1.00	
. <u> </u>	(24)	74.2	(158)		$0.58(0.39, 0.85)^{**}$	51.8	(57)	51.2	(22)		1.58(0.62, 4.0)	
9	5)	5.2	(11)		0.89(0.41, 1.92)	10.9	(12)	7.0	(3)		2.83(0.53, 15.06)	
				0.04						0.93		
3)	314) (62.8	(135)		1.00	66.7	(80)	65.9	(29)	1.00		
0 (3	(64)	37.2	(80)		0.70(0.51,0.97)*	33.3	(40)	34.1	(15)		1.75(0.69, 4.46)	
				0.02						0.04		
7	87)	32.9	(71)		1.00	49.6	(09)	31.8	(14)		1.00	
.3	80)	67.1	(145)		0.73(0.53, 1.01)	50.4	(61)	68.2	(30)		0.60(0.26, 1.40)	
				0.02						0.37		
4	5)	3.2	(2)		1.00	8.1	(6)	2.3	(1)		1.00	
.1	83)	93.5	(202)		0.27(0.11,0.63)**	87.4	(67)	90.7	(39)		0.25(0.03, 2.55)	
5	(1)	3.2	(2)		0.34(0.11, 1.12)	4.5	(5)	7.0	(3)		0.11(0.01, 1.73)	
backgro	und fact	ors listed	l in Table 1						14001			
	9 9 9 3 (3) 8 0 0 8 (6) (7) 1 1 1 (1) (1) (1) 1 1 (1) (1) (1) (1) 1 1 (1) (1) (1) (1) 1 1 (1) (1) (1) (1) 1 1 (1) (1) (1) (1) 1 1 (1) (1) (1) (1) 1 1 (1) (1) (1) (1)	9 (337) 3 (724) 8 (65) 9 (814) 0 (814) 0 (349) 3 (680) 3 (680) 1 (95) 1 (983) 5 (51) ackground fact	9 (337) 20.7 3 (724) 74.2 8 (65) 5.2 0 (814) 62.8 0 (349) 37.2 7 (487) 32.9 3 (680) 67.1 1 (983) 93.5 5 (51) 3.2 ackground factors listed	9 (337) 20.7 (44) 3 (724) 74.2 (158) 8 (65) 5.2 (11) 0 (314) 62.8 (135) 0 (349) 37.2 (80) 7 (487) 32.9 (71) 3 (680) 67.1 (145) 4 (95) 3.2 (7) 1 (983) 93.5 (70) 5 (51) 3.2 (7) ackground factors listed in Table 1 ackground factors listed in Table 1	9 (337) 20.7 (44) 3 (724) 74.2 (158) 8 (65) 5.2 (11) 0.04 0 (349) 37.2 (80) 0.02 7 (487) 32.9 (71) 0.02 3 (680) 67.1 (145) 0.02 4 (95) 3.2 (7) 1 (983) 93.5 (202) 5 (51) 3.2 (7) ackground factors listed in Table 1	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	9 (337) 20.7 (44) 1.00 37.3 (41) 41.9 3 (724) 74.2 (158) $0.58(0.39, 0.85)^{***}$ 51.8 (57) 51.2 8 (65) 5.2 (11) 0.04 $0.89(0.41, 1.92)$ 10.9 (12) 7.0 0 (814) 62.8 (135) 1.00 66.7 (80) 65.9 0 (814) 62.8 (135) 1.00 66.7 (80) 65.9 0 (349) 37.2 (80) 0.02 $0.70(0.51, 0.97)^*$ 33.3 (40) 34.1 7 (487) 32.9 (71) 1.00 66.7 $80)$ 65.1 34.1 7 (487) 32.9 (71) 1.00 67.3 34.1 91.6 66.0 31.8 7 (487) 32.9 (71) 1.00 67.3 91.6 66.2 80.3 66.0 31.8 7 (487) 32.3 0.71	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$

PSC people who used substances in mainland China; PSNC people who used substances in places other than mainland China; NA not applicable ^aThe counts may not add up to the total due to the presence of some missing values ^bAbout HK\$ 7.8=US\$ 1.

****p<*0.001

***p*<0.01 **p*<0.05

IADLE 4 JUDICIE USE-FEIALEU PE	crepulous and benaviors	or row bender			
	Men	n=1,167)	Wome	n (<i>n</i> =122)	
	%	$(u)^{a}$	%	$(n)^{a}$	χ^2 p value
Accessibility of substances					<0.001
No difference	24.3	(275)	37.8	(42)	
It is easier to obtain	60.5	(686)	39.6	(44)	
substances					
in mainland China					
It is easier to obtain	15.2	(172)	22.5	(25)	
substances					
in Hong Kong					
Perceived chance of					0.49
being arrested in					
mainland China					
due to substances use					
No chance	28.8	(325)	24.5	(27)	
Low chance	54.8	(619)	55.5	(61)	
High chance	16.4	(185)	20.0	(22)	
Main reason for using					0.19
substances in mainland					
China					
Lower price	29.8	(338)	23.9	(27)	
Peer influence	25.8	(293)	32.7	(37)	
Better availability	18.3	(208)	22.1	(25)	
Others	26.0	(295)	21.2	(24)	
First use of substances					0.01
in mainland China					
<6 months ago	48.1	(550)	36.0	(41)	
6–12 months ago	19.3	(221)	30.7	(35)	
1–2 years ago	13.5	(154)	16.7	(19)	

TABLE 4 Substance use-related perceptions and behaviors of PSC by gender

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>2 years ago	19.1	(218)	16.7	(19)	
Venue of using substances in mainland China ^b					0.05
Disco/Rave party	87.9	(1014)	84.0	(100)	
Bar	5.6	(65)	9.2	(11)	
Hotel	0.8	(6)	0.0	(0)	
Home/Friend's home	3.0	(35)	0.8	(1)	
Others	2.6	(30)	5.9	(2)	
Source of substances used					0.001
in mainland China ¹					
Obtained from friends	54.7	(020)	61.9	(73)	
for free					
Obtained from strangers	8.5	(98)	16.1	(19)	
for free					
Bought them by oneself	31.7	(365)	14.4	(17)	
in mainland China					
Brought them by oneself	1.2	(14)	1.7	(2)	
from Hong Kong					
Others	3.9	(45)	5.9	(2)	
Companion when using					0.28
substances in mainland					
China ^b					
None	17.4	(200)	11.2	(13)	
Friends	77.0	(885)	81.0	(94)	
Strangers	1.4	(16)	2.6	(3)	
Friends and strangers	4.3	(49)	5.2	(9)	
Types of substances used					
in mainland China in					
the last year					
Ecstasy	86.5	(1005)	81.0	(86)	0.1

	Men (<i>η</i> =1,167)	Women	n (n=122)	
	%	(<i>u</i>) ^a	%	(<i>u</i>) _a	χ^2 p value
Ketamine	79.4	(921)	70.2	(85)	0.02
Cannabis	65.7	(762)	47.1	(56)	<0.001
Methylamphetamine	18.7	(217)	21.8	(26)	0.41
Heroin	10.9	(126)	7.6	(6)	0.26
Used more than 1 types					0.001
of substance in mainland					
China in the last year					
Yes	81.3	(945)	68.6	(83)	
No	18.7	(217)	31.4	(38)	
	ainland China				
^a The counts may not add up to the to	ital due to the presence of so	me missing values			
^b In the last episode of substance use i	in mainland China				

TABLE 4 Continued

Comparing Substance Use-Related Behaviors and Perceptions Between PSC and PSNC

Of the male PSC and male PSNC, 28.1 and 12.9%, respectively, had used substances at least three times in the last month (adjusted odds ratio [adjusted OR]=3.05 for three to ten times and 2.92 for more than ten times, p<0.01, Table 3). PSC were also more likely than PSNC to have friends who frequently use substances in mainland China (men: adjusted OR=1.51, p<0.05; women: adjusted OR=3.79, p<0.01).

From Table 3, it can be seen that, as compared to male PSNC, male PSC were less likely to perceive substance use as having severe negative impacts on one's own physical health (adjusted OR=0.58, p<0.01) or easily/very easily addictive (adjusted OR=0.70, p<0.05), and perceived themselves as being less able to quit using substances (adjusted OR=0.27, p<0.01). Similar comparisons between female PSC and female PSNC were not of statistical significance.

Perceptions and Patterns Related to Substance Use in Mainland China Among PSC

Perceptions Of the male PSC and the female PSC, respectively, 60.5 and 39.6% believed that it is easier to obtain substances in mainland China (as compared to in Hong Kong), whereas only 15.2 and 22.5%, respectively, of the two groups stated the reverse was true and female PSC were more likely than male PSC to hold such a belief (p<0.001, Table 4).

About one-fourth (28.8% for male PSC and 24.5% for female PSC) believed that there is no chance of being arrested in mainland China because of substance use; 16.4% of the male PSC and 20% of the female PSC believed that the chance is high. Further, 29.8 and 23.9%, respectively, of the male and female PSC mentioned lower price as the main reason for using substances in mainland China; 25.8 and 32.7%, respectively, mentioned peer influences, whereas 18.3 and 22.1%, respectively, mentioned better availability as the main reason. No significant gender differences were observed in these two variables (Table 4).

Pattern of Substance Used in Mainland China About 33% of both male and female PSC had been using substances in mainland China for more than 1 year, whereas 48.1 and 36% of male and female PSC, respectively, had been using substances in mainland China for less than 6 months. Male PSC were more likely than female PSC to have been using substances in mainland China for less than 6 months (p=0.01, Table 4).

Regarding the last episode of substance use in mainland China, the majority of the PSC (87.9 and 84%, respectively, for male and female PSC) had used substances in discos or rave parties; another 5.6% (male) and 9.2% (female) of the PSC used substances in bars; and a few percent used substances in hotels or private homes (Table 4). It is interesting to note that, in the last episode of substance use, many PSC obtained free substances from their friends (54.7% for male PSC and 61.9% for female PSC) or from strangers (8.5 and 16.1%, respectively). Only 31.7% of the male PSC and 14.4% of the female PSC were buying substances in mainland China and very few (1.2 and 1.7%, respectively, for male PSC and female PSC) brought the substances with them from Hong Kong. Relatedly, 77% of the male PSC and 81% of the female PSC) accompanied by both friends and strangers

when they were using substances in mainland China. Relatively few used substances alone (17.4% for male PSC and 11.2% for female PSC) or used substances only with strangers (1.4 and 2.6%, respectively, for male PSC and female PSC, Table 4). Among the three items abovementioned, a significant gender difference was observed only for the one related to the sources of substances. Male PSC were more likely than female PSC to have bought substances in mainland China for the last episode of substance use in mainland China (p=0.001, Table 4).

Types of Substance Used in Mainland China Among the male and female PSC, respectively, 86.5 and 81%, respectively, self-reported having used ecstasy in mainland China in the last year (χ^2 test, p=0.1; Table 4); 79.4 and 70.2%, respectively, had used ketamine (p<0.05); 65.7 and 47.1%, respectively, had used cannabis (p<0.001); 18.7 and 21.8%, respectively, had used methylamphetamine (p=0.41); and 10.9 and 7.6%, respectively, had used heroin (p=0.26). The majority of the PSC had used multiple types of substances in mainland China in the last year (about 81 and 69% for male PSC and female PSC, respectively, χ^2 test, p<0.001, Table 4). Such questions were not asked of the PSNC group.

DISCUSSION

A fairly high proportion of the male and female travelers interviewed were PSC. It is speculated that the prevalence of substance use might be fairly high among the studied cross-boundary travelers. Another independent study estimated that roughly 26 and 78.6%, respectively, of the male respondents of age 18–25 and 26–35 who had used substances in the last 6 months had done so in mainland China.¹⁹ Prevention and surveillance programs targeting young Hong Kongmainland China travelers are warranted.

Ecstasy was the substance that had been most commonly reported to have been used by PSC, followed by ketamine, cannabis, methylamphetamine, and heroin. The actual ingredients of these substances were unknown. It is common for PSC to have reported using more than one type of substance in mainland China in the last year. Further investigation should be made on whether they are mixing substances for consumption simultaneously.

A fairly high percentage of the PSC may be using heroin in mainland China. HIV prevalence among injecting drug users (IDU) in mainland China is considerably high, and it is the driving force of the epidemic in mainland China.²⁵ In the Guangdong province, a study on female drug users reported a HIV prevalence of about 6% among IDU.²⁶ The risk of PSC using heroin serving as a bridge population for the transmission of HIV between Hong Kong and mainland China, therefore, exists and needs to be investigated.

Some attention should be given to the high proportions of unemployed Hong Kong youths (especially among women) using substances in mainland China. The unemployment rate among Hong Kong young adults has been very high (30.2% for the 15–19 age group and 8.8% for the 20–29 age group in 2003).²⁷ Substance use prevention programs should, therefore, have more interactions with other social programs, such as the ones serving unemployed youths.

It is possible that these cross-boundary substance use habits were practiced on a regular basis. It should, however, be noted that about 48 and 36%, respectively, of the male and female PSC had been using substances in mainland China only for 6 months or less, which may indicate that there are quite a number of new recruits.

The majority of the PSC had some friends who were frequently using substances in mainland China, were accompanied by some friends in their last episode of substance use in mainland China, and were provided with substances by their friends for free. It is very likely that peer influence plays an important role in cross-boundary substance use behaviors (about one-fourth of the male PSC and about one-third of the female PSC chose peer influences as the main reason for their use of substances in mainland China). The effects of conformity to peer pressure should be studied in depth. Peer education may be one of the possible effective prevention strategies. Skills training to refuse improper requests made by peers should also be considered as part of the programs.

Male PSC, as compared to male PSNC, had more misconceptions about the negative aspects of substance use. Further, the majority of the PSC believed that they could quit the substance use habit. Cross-boundary prevention programs are, therefore, facing additional difficulties and should emphasize rectifying relevant health beliefs.

Lower price, peer influence, and better perceived availability were mentioned as the key reasons for using substances in mainland China by the majority of the PSC. The majority of the PSC obtained their substances in mainland China. It seems that substances are readily available to the PSC. To reduce the supply may effectively decrease the availability of substances. Supply also has an implication on price. Further, the majority of the PSC believed that there is little or no chance for one to be arrested in mainland China for substance use. Liaison with the law enforcement departments in Shenzhen (a city that is contiguous to Hong Kong) and other cities in mainland China may be required to change the misperception.

The majority of the PSC were also obtaining substances for free. This was especially true for female PSC. The free supply may be appealing to the unemployed young adults or those without income, which seemed to make up a substantial proportion of the PSC.

The findings confirmed the impression that most of the substance use activities in mainland China were carried out in discos or rave parties. Prevention programs may be launched in these establishments, with the assistance of the public security system in mainland China. Because substances are often distributed in these venues, stronger law enforcement in these places would remove these "meeting grounds" for dissemination of substances and substance use. It is believed that this would have a strong impact on the prevalence of cross-boundary substance use. This would also change the impression that there is a low chance of being arrested in mainland China for substance use and that substances are readily available.

The study has several limitations, one of which being that there was no community-based control group in the study. Instead, travelers who were PSNC were used as the control group in the relevant analyses. It could not be ascertained whether members of this PSNC traveler group are similar in behaviors to those substance users who seldom traveled to mainland China. Interpretations should, therefore, be made with caution. The sampling design does not allow for prevalence estimation, as the sampling process was not random and the differences between the traveler population and the general population are not known.

Furthermore, the overall response rate of the study (approximately 56%) was moderate, although it was comparable to studies of other topics conducted at the Lo Wu checkpoint and many other telephone surveys of various topics conducted in Hong Kong.^{9,10,28–32} Data were self-reported. Response bias because of social desirability may exist. However, this type of bias is somehow less relevant, as the purpose of the study was not prevalence finding, and those admitting substance use should be less influenced in describing their patterns of substance use in mainland China in a biased way because of social desirability. The special data collection method has also been shown to be able to reduce possible response biases. Moreover, the length of the questionnaire also limits the number of questions and, hence, the depth of the data collected.

In conclusion, to address the cross-boundary substance use among Hong Kong young adults, policy formulation should take their characteristics, as indicated by the study results, into account. A joint collaboration approach between authorities in Hong Kong and mainland China is also required.

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REFERENCES

- 1. Elliott L, Morrison A, Ditton J, et al. Alcohol, drug use and sexual behaviour of young adults on a Mediterranean dance holiday. *Addict Res.* 1998;6:319–340.
- 2. Lange JE, Voas RB. Youth escaping limits on drinking: binging in Mexico. *Addiction*. 2001;95:521–528.
- 3. Lange JE, Voas RB, Johnson MB. South of the border: a legal haven for underage drinking. *Addiction*. 2002;97:1195–1203.
- 4. Des Jarlais DC, Johnston P, Friedmann P, et al. Patterns of HIV prevalence among injecting drug users in the cross-border area of Lang Son Province, Vietnam, and Ning Ming County, Guangxi Province, China. *BMC Public Health*. 2005;5:89.
- 5. Hammett TM, Kling R, Johnston P, et al. Patterns of HIV prevalence and HIV risk behaviors among injection drug users prior to and 24 months following implementation of cross-border HIV prevention interventions in northern Vietnam and southern China. *AIDS Edu Prev.* 2006;18:97–115.
- Lau JTF, Tsui HY, Lam L. Alcohol consumption, sex, and use of psychotropic substances among male Hong Kong-mainland China cross-border substances users. *Addict Behav.* 2007;32:686–699.
- 7. Berger LJ, Westermeyer J. "World Traveler" addicts in Asia: II. Comparison with "Stay at home" addicts. Am J Drug Alcohol Abuse. 1977;4:495-503.
- Department of Census and Statistics, Hong Kong SAR. Transport, Communications and Tourism. Available at: http://www.info.gov.hk/censtatd/eng/hkstat/hkinf/transport_ index.html. Accessed March 29, 2004.
- 9. Lau JTF, Thomas J. Risk behaviours of Hong Kong male residents travelling to mainland China: A potential bridge population for HIV infection. *AIDS Care*. 2001;13:71–81.
- Lau JTF, Tsui HY. HIV/AIDS behavioral surveillance surveys of the cross-border sexnetworker population in Hong Kong from 1997 to 2001. Sex Transm Dis. 2003;30:827–834.
- 11. Lau JTF, Tang ASY, Tsui HY. The relationship between condom use, sexually transmitted diseases, and location of commercial sex transaction among male Hong Kong clients. *AIDS*. 2003;17:105–112.
- 12. Lau JTF, Kim JH, Lau M, Tsui HY. Prevalence and risk behaviors of Hong Kong males who seek cross-border same-sex partners in mainland China. *Sex Transm Dis.* 2004;31:568–574.

- Chen KT, Chen CJ, Fagot-Campagna A, Narayan KM. Tobacco, betel quid, alcohol, and illicit drug use among 13- to 35-year-olds in I-Lan, rural Taiwan: prevalence and risk factors. *Am J Public Health*. 2001;91:1130–1134.
- Grant BF. Prevalence and correlates of drug use and DSM-IV drug dependence in the United States: results of the National Longitudinal Alcohol Epidemiologic Survey. J Subst Abuse. 1996;8:195–210.
- 15. Merline AC, O'Malley PM, Schulenberg JE, Bachman JG, Johnston LD. Substance use among adults 35 years of age: prevalence, adulthood predictors, and impact of adolescent substance use. *Am J Public Health*. 2004;94:96–102.
- 16. Turner C, Russell A, Brown W. Prevalence of illicit drug use in young Australian women, patterns of use and associated risk factors. *Addiction*. 2003;98:1419–1426.
- Warner LA, Kessler RC, Hughes M, Anthony JC, Nelson CB. Prevalence and correlates of drug use and dependence in the United States. Results from the National Comorbidity Survey. Arch Gen Psychiatry. 1995;52:219–229.
- Lau JTF, Lau M, Chong KS, et al. The 2000 Survey of Drug Use among Students: Executive Report. Narcotics Division, Security Bureau, Hong Kong Special Administrative Region, China. January 2002.
- Lau JTF, Kim JH, Tsui HY. Prevalence, health outcomes and patterns of psychotropic substance use in a Chinese population in Hong Kong: A population-based study. *Subst Use Misuse*. 2005;40:187–209.
- 20. Wei H, Young D, Lingjiang L, et al. Psychoactive substance use in three sites in China: gender differences and related factors. *Addiction*. 1995;90:1503–1515.
- Kecskes I, Rihmer Z, Kiss K, Sarai T, Szabo A, Kiss GH. Gender differences in panic disorder symptoms and illicit drug use among young people in Hungary. *Eur Psychiatry*. 2002;17:29–32.
- 22. Lau JTF, Thomas J, Liu JLY. Mobile phone and interactive computer interviewing to measure HIV-related risk behaviours—the impacts of data collection methods on research results. *AIDS*. 2000;14:1277–1279.
- 23. Lau JTF, Tsui HY, Wang QS. Effects of two telephone survey methods on the level of reported risk behaviors. *Sex Transm Infect*. 2003;79:325–331.
- 24. Lau JTF, Thomas J, Lin CK. HIV-related behaviours among voluntary blood donors in Hong Kong. *AIDS Care*. 2002;14:481–492.
- 25. Feng C, Des Jarlais D. HIV among drug users in China. Science. 2002;298(5596):1171.
- 26. Deng A, Xu Y, Lin P. Risk behavior characteristics and seroprevalence of HIV among female drug users in Guangdong. [Chinese]. Proceedings of Third Workshop on HIV Surveillance and Epidemiology in the Pearl Delta River Region. 7–9 November 2002. Shenzhen, China. Available at: http://www.info.gov.hk/aids/english/surveillance/ pearl.htm. Accessed June 14, 2004.
- 27. Department of Census and Statistics, Hong Kong SAR. Unemployment rate by sex and age. Available at: http://www.info.gov.hk/censtatd/eng/hkstat/fas/labour/ghs/unemp_by_s_a_index.html. Accessed June 2, 2004.
- 28. Brieger GM, Yip SK, Hin LY, Chung TK. The prevalence of urinary dysfunction in Hong Kong Chinese women. *Obstet Gynecol*. 1996;88:1041–1044.
- 29. Chou KL, Mak KY, Chung PK, Ho K. Attitudes towards mental patients in Hong Kong. Int J Soc Psychiatry. 1996;42:213–219.
- 30. Lau JTF, Siah PC. Behavioural surveillance of sexually-related risk behaviours of the Chinese male general population in Hong Kong: a benchmark study. *AIDS Care*. 2001;13:221–232.
- 31. Tang CS. The rate of physical child abuse in Chinese families: a community survey in Hong Kong. *Child Abuse Negl.* 1998;22:381–391.
- 32. Wong IL, So EM. Prevalence estimates of problem and pathological gambling in Hong Kong. *Am J Psychiatry*. 2003;160:1353–1354.