

The relationship between condom use, sexually transmitted diseases, and location of commercial sex transaction among male Hong Kong clients

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Objective: This study investigated the consistency of condom use and the prevalence of self-reported sexually transmitted diseases (STD) among male Hong Kong commercial sex clients with respect to the geographical location of these transactions.

Design and methods: Male clients were identified via three independent, population-based surveys conducted in 1998, 1999, and 2001. A unique confidential telephone system was used to collect sensitive information.

Results: Respondents patronizing female sex workers (FSW) in 'mainland China only' or in 'mainland China and other places' were more likely to be inconsistent condom users (28 and 34%) than those patronizing FSW in 'Hong Kong only' (9.1%). A similar pattern was found for self-reported STD in the past 6 months (10.1, 8.1 and 1.0%, respectively). Patronizing FSW in mainland China was associated with a higher prevalence of self-reported STD (adjusted OR 4.16), independent of consistent condom use and other potential confounding factors, including calendar year of survey, age, educational attainment, HIV-related knowledge, perceived efficacy of condom use for HIV/AIDS prevention, number of female sex partners, and the presence of a regular female sex partner in the past 6 months. Clients who had commercial sex both in mainland China and Hong Kong were more likely to use condoms in Hong Kong than in mainland China (paired OR 4.67, $P < 0.05$).

Conclusion: The geographical location of commercial sexual activity is related to the consistency of condom use, irrespective of the clients engaged in such activity. Prevention programmes need to be aware of how risk behaviour is dependent on local contexts.

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Introduction

Cross-border commercial sex is crucial in the spread of HIV [1–4]. Commercial sex clients can serve as a 'bridge population' transmitting the infection from one place to another [5–7]. It is estimated that approximately 12–14% of the male adult population in Hong Kong has engaged in commercial sex in the past 6 months, with approximately 50% of them having

patronized female sex workers (FSW) in mainland China [8]. Approximately 32.5% of male adult travellers returning from mainland China to Hong Kong had engaged in commercial sex, approximately a third of them were not consistent condom users, and approximately a fifth had at some time contracted sexually transmitted diseases (STD) [5]. Other studies targeting cross-border truck drivers and businessmen in Hong Kong [9,10] also reported a similarly high prevalence of

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risk behaviours. Also, only 16% of cross-border commercial sex clients in Hong Kong have ever undergone an HIV antibody test [11]. A bridging effect between a high-risk population and a lower-risk population may also exist because Hong Kong-mainland China cross-border male commercial sex clients would often not use condoms with their spouse or regular sex partner(s) [12].

Hong Kong residents visited mainland China 50 million times in the year 2000 [13]. It has been estimated that over 10 000 of these travellers patronize FSW on a daily basis [5]. Furthermore, it is estimated that there are currently over 600 000 HIV-infected individuals in China [14]. An increasing incidence of STD has been reported both in Hong Kong and in mainland China. For example, the incidence of syphilis has increased by 15 times over the past few years in Shenzhen [15], a mainland China city that is contiguous with Hong Kong, and thereby a very popular destination for cross-border commercial sex. HIV prevention workers in Hong Kong have recognized that their work requires a regional approach [16].

Geographical differences in condom use, the frequency of self-reported STD, and the strength of association between these two variables, may exist as a result of contextual differences in cultural, economic and social situations, knowledge about STD/HIV, condom availability, and STD incidence, etc. However, there are very few, if any, studies investigating whether condom use etc. depends on the location of commercial sex.

Objectives

This study has the following objectives: to examine whether the consistent condom use of Hong Kong commercial sex clients varies by the geographical location where commercial sex takes place; and to determine whether the prevalence of self-reported STD in the past 6 months varies according to the geographical location, independent of condom use.

Subjects and methods

A total of 618 Hong Kong Chinese male adults who reported having had sexual intercourse with FSW in the past 6 months were identified from three carefully conducted and repeated population-based HIV behavioural surveillance surveys carried out in July 1998, November 1999, and June 2001 [17]. An identical method was used for the three surveys, which successfully interviewed 1020, 2074, and 2065 male Hong Kong residents, respectively, in the 3 years. The proportion of respondents having patronized FSW in these three surveys was 14.0% (143/1020), 12.2% (252/2074), and 10.8% (223/2065), respectively.

Telephone numbers were sampled randomly from up-to-date residential phone directories. Almost 100% of the Hong Kong residents have telephones at home (Hong Kong Office of the Telecommunications Authority, personal communication, 28 January 2000). The interviews were conducted between 18.00 and 22.30 hours. Unanswered telephone calls were given at least two attempts per night for a 2-week period before being classified as invalid.

After briefing the individual who answered the phone that the study was going to collect opinions about HIV/AIDS prevention and it was sponsored by the Hong Kong Council for the AIDS Trust Fund, and that their contribution would help government's policy formulation, the male household member between the ages of 18 and 60 years whose past birthday was closest to the day of the interview was invited to participate in the study. Approximately 77% of the households with at least one male member had only one male member, 17.9% had two, and only 5% had more than two male household residents (Department of Census and Statistics, personal communication, 26 April 2002). Therefore, weighting by the number of male household members would not result in much difference and was not carried out. Eligible respondents were then briefed and were asked for their consent to join the study.

The interviewer then asked four non-sensitive questions to establish rapport (part I, two related to HIV-related knowledge, and two on age and education level). The respondents were then briefed that part II of the questionnaire would cover questions related to HIV/AIDS-related behaviours, and such questions were pre-recorded in a computerized phone system (the 'Dot-line' service), and that they only needed to key in their responses. Respondents were guaranteed that their telephone number would not be recorded. Anonymity and confidentiality were therefore enhanced. Previous studies showed that this computerized call-in method resulted in a higher reported frequency of risk behaviours than other conventional methods [18,19].

For those who agreed to enter the second part of the interview, they were connected to the 'Dot-line' via the 'Conference Line Service' (which allows one of the two parties to call a third one without hanging up and allows all three parties to make simultaneous phone conversations). The interviewer left the line after the connection was made.

The same structured questionnaire was used in all three surveys. The sensitive questions from part II asked whether the respondent had had sexual intercourse with FSW in the past 6 months; and if so, whether the respondent used condoms every time he had sexual intercourse with FSW, the geographical locations

where the commercial sex transaction took place (Hong Kong, mainland China, Macau, or other countries), and whether the respondent had been infected with STD in the past 6 months.

Out of all valid household contacts (with at least one Chinese man aged 18–60 years, $n = 2213$, 4713, and 4613 in the 3 years, respectively), approximately 50% of them had one eligible male member join and complete the non-sensitive part I (51.6, 46.8 and 48.2%); 89.2, 94.1 and 92.9% of these respondents went on to complete the sensitive part II questionnaire. A fairly high percentage (over 40%) of the incompleting part II questionnaires was caused by technical problems (e.g. using a pulse mode phone). The overall response rates, defined as the number of completed interviews divided by the total number of valid household contacts, were 46.1% (1020/2213), 44.0% (2074/4713), and 44.8% (2065/4613) in 1998, 1999, and 2001, respectively.

Statistical analysis

The percentage distributions of the main studied variables (i.e. condom use and self-reported STD in the past 6 months) were tabulated across the different geographical locations of commercial sex transactions. The χ^2 test, McNemar test, and relevant odds ratios were used to examine the significance and strength of

associations. Logistic regression analyses were carried out to examine the relationship between the geographical variations in STD prevalence and similar variations in the frequency of condom use, as well as the interaction between location and condom use to determine STD. A significance level of $P < 0.05$ was used. The analyses were performed using SPSS for Windows, version 10.1.

Results

Profile of commercial sex clients

Approximately 90% of the respondents mentioned sexual intercourse as a means of HIV transmission and approximately 70% of them perceived condom use as an efficacious means of HIV/AIDS prevention. The results of these questions were generally comparable across the 3 years of the survey (Table 1).

Location of commercial sex

In this study, respondents were classified into four groups by the location of commercial sex: 'Hong Kong only' (18.0%), 'mainland China only' (18.2%), 'mainland China and other places' (44.9%), and 'other scenarios' (i.e. other than the above-mentioned combinations, e.g. South-East Asian countries, 18.9%).

Table 1. Profile of the male commercial sex clients identified from the 1998, 1999 and 2001 surveys ($n = 618$).

	1998 ($n = 143$) %	1999 ($n = 252$) %	2001 ($n = 223$) %	All ($n = 618$) %
Age group				
18–30	50.3	44.6	35.4	42.6
31–40	30.1	31.3	32.3	31.4
41–60	19.6	24.1	32.3	26.0
Education level				
Secondary 4 or below	23.2	38.6	27.4	31.0
Secondary 5 graduates	57.0	38.6	42.6	44.3
Secondary 6 or above	19.7	22.7	30.0	24.7
Knowledge about HIV transmission ^a				
Mentioned that HIV can be transmitted via sexual intercourse	87.4	86.9	89.2	87.9
Not mentioned	12.6	13.1	10.8	12.1
Mentioned that HIV can be transmitted via sharing needles	31.5	35.3	44.8	37.9
Not mentioned	68.5	64.7	55.2	62.1
Mentioned that HIV can be transmitted via contaminated blood products	45.5	48.0	46.2	46.8
Not mentioned	54.5	52.0	53.8	53.2
Mentioned that HIV can be transmitted via mother–infant transmission	2.8	6.3	5.4	5.2
Not mentioned	97.2	93.7	94.6	94.8
Number of correct way(s) mentioned that HIV can be transmitted ^b				
None	9.8	4.8	5.4	6.1
One correct answer	28.0	34.1	24.7	29.3
Two correct answers	47.6	40.9	48.9	45.3
Three correct answers	14.7	20.2	21.1	19.3
Perceived efficacy of condom use for HIV/AIDS prevention				
Very efficacious/efficacious	67.8	67.6	72.1	69.3
Average/inefficacious/very inefficacious	32.2	32.4	27.9	30.7

^aIn an open-ended question, respondents were asked to name three routes of HIV infection.

^bThe number of 'correct' answers (including sexual intercourse, mother–infant transmission, sharing needles and contaminated blood products) given by the respondents in the question described by note ^a.

Respondents in the ‘mainland China only’ group tended to be older and attained less education; those in the ‘mainland China and other places’ group tended to have had more sex partners in the past 6 months than the other three groups. The percentages having had a regular female sex partner (spouse or steady girlfriend) were not significantly different among the four groups (Table 2).

Frequency of condom use with female sex workers

It can be seen that the frequency of condom use was highly dependent on the geographical location where the commercial sex took place ($\chi^2 = 26.6$, $df = 3$, $P < 0.001$, Table 3). Although only 9.1% of the ‘Hong

Kong only’ commercial sex clients (patronized FSW only in Hong Kong) did not use condoms consistently (i.e. used condoms every time when having sexual intercourse with FSW), the figures among those who patronized FSW in ‘mainland China only’ (practised commercial sex only in mainland China) or in ‘mainland China and other places’ (practised commercial sex in mainland China and other places) were 28.0 and 34.4%, respectively. The percentage of inconsistent condom users among those who did not belong to the three above-mentioned categories (i.e. ‘other scenarios’) was intermediate between the ‘Hong Kong only’ and the ‘mainland China only’ groups (19.2%). Furthermore, such geographical differences were highly significant, even after adjusting for the relevant back-

Table 2. Characteristics of commercial sex clients by geographical location of commercial sex activity.

	Location of commercial sex				<i>P</i> (χ^2 test)
	Hong Kong only (n = 99) %	Mainland China only (n = 100) %	Mainland China and other places (n = 247) %	Other scenarios (n = 104) %	
Age group (years)					
18–30	53.5	22.4	42.3	47.1	< 0.001
31–40	28.3	32.7	34.1	29.8	
41–60	18.2	44.9	23.6	23.1	
Education level					
Secondary 4 or below	29.3	41.8	32.0	17.3	< 0.01
Secondary 5 graduates	48.5	38.8	43.7	48.1	
Secondary 6 or above	22.2	19.4	24.3	34.6	
Number of female sex partners in past 6 months					
Four or more	16.2	15.0	35.2	23.1	< 0.001
Less than four	83.8	85.0	64.8	76.9	
Have had a regular female sex partner (spouse or steady girlfriend) in past 6 months					
No	51.5	40.0	47.0	45.2	0.428
Yes	48.5	60.0	53.0	54.8	

Table 3. Consistency of condom use with female sex workers in the past 6 months among male Hong Kong commercial sex clients by geographical location of commercial sex activity.

Destination of commercial sex	Consistent condom use ^a		OR ^b (95% CI)	<i>P</i>	Adjusted odds ratio			
	Yes n (%)	No n (%)			OR ^c (95% CI)	<i>P</i>	OR ^d (95% CI)	<i>P</i>
Hong Kong only (n = 99)	90 (90.9)	9 (9.1)	1.00		1.00		1.00	
Mainland China only (n = 100)	72 (72.0)	28 (28.0)	3.89 (1.73–8.76)	0.001	3.06 (1.32–7.07)	0.009	3.40 (1.44–8.03)	0.005
Mainland China and other places (n = 247)	162 (65.5)	85 (34.4)	5.25 (2.52–10.93)	<0.001	5.28 (2.51–11.13)	<0.001	4.18 (1.94–8.98)	< 0.001
Other scenarios (n = 104)	84 (80.8)	20 (19.2)	2.38 (1.03–5.52)	0.043	2.53 (1.08–5.96)	0.033	2.43 (1.01–5.84)	0.047
Total (n = 550)	408 (74.2)	142 (25.8)						

CI, Confidence interval; OR, odds ratio.

^aConsistent condom use refers to using a condom every time when having sexual intercourse with a female sex worker. The question asked was ‘In the past six months, did you use a condom when having sexual intercourse with female sex workers?’. Answers included: used every time, sometimes, seldom, and never used.

^bUnadjusted odds ratio.

^cAdjusted for year of survey, age and education level.

^dAdjusted for year of survey, age, education level, HIV-related knowledge level, perceived efficacy of condom use for HIV/AIDS prevention, number of female sex partners, and having a regular female sex partner in past 6 months.

ground variables (see Table 3). Compared with the 'Hong Kong only' group, the adjusted odds ratios (OR) for inconsistent condom use among those who patronized FSW in mainland China were as high as 3.40–4.18 ($P < 0.01$, Table 3).

In the 2001 survey, those who admitted having purchased commercial sex in Hong Kong ($n = 125$), mainland China ($n = 120$), Macau ($n = 67$), and other places ($n = 40$), were asked some supplemental questions about their consistency of condom use during sexual intercourse with FSW in these particular places. It can be seen that commercial sex clients who patronized FSW in mainland China were more likely to be inconsistent condom users than those who had commercial sex in other places (Table 4).

Furthermore, in the 2001 survey, 63 respondents patronized FSW both in Hong Kong and in mainland China. However, they reported significantly different percentages of inconsistent condom use in the past 6 months when having commercial sex – 14.3% in Hong Kong versus 31.7% in mainland China (paired OR 4.67, McNemar test, $P = 0.01$). Therefore, even among the same group of commercial sex clients, the frequency of condom use with FSW in Hong Kong was higher than the frequency of condom use with FSW in mainland China.

Self-reported sexually transmitted diseases in the past 6 months

It can be seen that the prevalence of self-reported STD in the past 6 months among patrons of FSW in mainland China (8.1–10.1%) were much higher than that among patrons of FSW in Hong Kong only (unadjusted OR 8.63–11.01, see Table 5). Furthermore, the difference between the 'mainland China only' and the 'Hong Kong only' groups were still statistically significant after adjusting for other relevant variables (see Table 5). The difference between the 'mainland China and other places' group and the 'Hong Kong only' group was close to achieving statistical significance ($P = 0.083$).

Independent effects of geographical location and condom use on the prevalence of self-reported sexually transmitted diseases

The statistically significant relationship between the patronage of FSW in mainland China and the prevalence of self-reported STD in the past 6 months was further examined, stratifying by (adjusting for) the frequency of condom use (consistent or inconsistent users). There is no evidence of multiplicative interaction (P value for test for homogeneity = 0.530, Breslow–Day test). It is interesting to see that 3.9% of the consistent condom users who patronized FSW in mainland China reported having contracted STD in the past 6 months, which was much higher than those consistent condom users who patronized FSW in places other than mainland China (0.6% only, OR 6.95, $P = 0.049$ by Fisher's exact test). Similarly, 18.6% of the inconsistent condom users who patronized FSW in mainland China reported having contracted STD in the past 6 months compared with 6.9% of the inconsistent condom users who patronized FSW in places other than mainland China. The results indicate that patronizing FSW in mainland China was associated with a higher prevalence of self-reported STD, even after adjusting for the consistency of condom use (OR_{Mantel-Haenszel} 4.24, 95% confidence interval 1.26–14.29; $\chi^2_{MH} = 5.40$, $df = 1$, $P = 0.02$).

Fitting a multiple logistic regression model to predict self-reported STD yielded similar results. Adjusting for the calendar year of survey, age, education level, HIV-related knowledge, perceived efficacy of condom use for HIV/AIDS prevention, number of female sex partners, and the presence of a regular female sex partner in the past 6 months, patronage of FSW in China (OR 4.16, $P = 0.025$) and inconsistent condom use (OR 5.02, $P < 0.001$) remained independent predictors of self-reported STD. The interaction term was not significant to enter the model in the stepwise procedure (Wald statistics 0.385, $df = 1$, $P = 0.535$).

Discussion

The results of this study indicate that the social and

Table 4. Consistency of condom use among male commercial sex clients by geographical location of commercial sex activity (year 2001 survey data only).

Geographical location of commercial sex activity ^a	Consistent condom use ^b when having sex in that city/country n(%)	Inconsistent condom use when having sex in that city/country n(%)
Hong Kong ($n = 125$)	110 (88.0)	15 (12.0)
Mainland China ($n = 120$)	87 (72.5)	33 (27.5)
Macau ($n = 67$)	59 (88.1)	8 (11.9)
Other cities/countries ($n = 40$)	34 (85.0)	6 (15.0)

^aRespondents might have patronized female sex workers in more than one destination.

^bFor respondents admitting having patronized female sex workers in a certain place, they were directly asked 'Did you use a condom every time when having sexual intercourse with a female sex worker in that place'. Answers included yes or no. Consistent condom user refers to those using condoms every time when having sexual intercourse with female sex workers.

Table 5. Self-reported sexually transmitted diseases in the past 6 months among male commercial sex clients by geographical location of commercial sex activity.

Destination of commercial sex	Self-reported STD in past 6 months			Adjusted odds ratio					
	No n (%)	Yes n (%)	P	OR ^a (95% CI)	OR ^b (95% CI)	P	OR ^c (95% CI)	OR ^d (95% CI)	P
Hong Kong only (n = 99)	98 (99.0)	1 (1.0)		1.00	1.00		1.00	1.00	
Mainland China only (n = 100)	89 (89.9)	10 (10.1)	0.023	11.01 (1.38–87.71)	10.05 (1.23–82.36)	0.032	11.61 (1.38–97.43)	7.54 (0.89–63.80)	0.064
Mainland China and other places (n = 247)	227 (91.9)	20 (8.1)	0.037	8.63 (1.14–65.21)	8.54 (1.12–64.85)	0.038	6.14 (0.79–47.77)	5.04 (0.64–39.51)	0.123
Other scenarios (n = 104)	102 (98.1)	2 (1.9)	0.596	1.92 (0.17–21.52)	1.99 (0.18–22.39)	0.579	1.72 (0.15–19.89)	1.46 (0.13–16.87)	0.761
P value (χ ² test)	0.006								

CI, Confidence interval; OR, odds ratio; STD, sexually transmitted disease.

^aUnadjusted odds ratio.

^bAdjusted for year of survey, age and education level.

^cAdjusted for year of survey, age, education level, HIV-related knowledge, perceived efficacy of condom use for HIV/AIDS prevention, number of female sex partners, and having a regular female sex partner in past 6 months.

^dAdjusted for year of survey, age, education level, and condom use with female sex workers in past 6 months.

cultural milieu of the geographical location where commercial sex acts take place needs to be carefully considered when promoting safer sex measures among commercial sex clients. It was noted that condom use was much less common among the Hong Kong male patrons of FSW in mainland China, than among such patrons of FSW in Hong Kong or other places, even after controlling for the calendar year of survey and other relevant variables. This holds true even among commercial sex clients who concomitantly patronized FSW in Hong Kong and in mainland China, suggesting that the observed geographical differences in condom use were not caused by the different characteristics of the clients visiting different destinations. Instead, behaviours depend on differing societal contexts.

The data suggest that condom use depends not only on the characteristics of individual commercial sex clients, but is likely to be related to the local socioeconomic, cultural and health environments. This may include factors such as HIV or STD-related knowledge, the attitudes and practices of FSW, as well as their extent of control over condom use. Cultural norms and environmental factors such as the relative status and power of men versus women and the economic burden of the FSW may also directly and indirectly influence whether condoms are being used by FSW. Health awareness and valuing one's health may also be among the list of factors. It is important for public health workers to put HIV prevention work in its appropriate social environment and cultural context.

Data have shown that knowledge related to STD, HIV and condom use is often lacking among FSW in mainland China, and that the failure to use condoms was often a result of customers' demands [20]. It is speculated that sex workers in China were less likely to insist on using condoms than their counterparts in Hong Kong, possibly because of lower HIV awareness, higher monetary pressures and lower negotiation power. Education and empowerment are therefore essential. Furthermore, sex establishments in Hong Kong (such as brothels) are generally 'guarded' by male proprietors, and large numbers of condoms are explicitly displayed in the venue. Although organizing FSW to work for one is illegal, working as a FSW is not criminalized in Hong Kong, whereas in mainland China, working as a FSW is illegal and can result in imprisonment. Commercial sex establishments in mainland China are more vulnerable to criminal prosecution, and the existence of condoms could be used as evidence against the FSW. These circumstantial factors may reduce the chance of FSW using condoms in mainland China.

Another alternative explanation of the different condom use levels between Hong Kong and mainland China is that male respondents in Hong Kong may

perceive that there is a lower risk of STD/HIV infection as a result of unprotected sex with FSW in mainland China, when compared with similar acts with FSW in Hong Kong or elsewhere. However, male adults of the general population in Hong Kong perceived a higher HIV infectivity among FSW in mainland China compared with their counterparts in Hong Kong [21]. The above-mentioned data were obtained from the male general population but not from the commercial sex client population, so that further investigation is necessary before the hypothesis can be supported.

The data allow a comparison of the level of condom use among FSW in the region. By understanding various cultural and social factors determining condom use, more specific and effective programmes can be devised.

It is not surprising to see that the prevalence of self-reported STD showed a geographical pattern that is consistent with that of condom use. The two are strongly associated with each other in many studies [5]. It is, however, very interesting to see that the Hong Kong–mainland China geographical difference in self-reported STD was only partly explained by the consistency of condom use (OR reduced from 6.33 to OR_{MH} 4.24, after adjusting for condom use by the stratification method). The ‘unexplained’ part of the association may be related to differences in STD infectivity in mainland China compared with Hong Kong or other places. It was estimated that the STD prevalence among FSW in mainland China was as high as 30% [22]. A recent study of 966 FSW working in Guangzhou found that the STD prevalence ranged from 8% (gonorrhoea) to 32% (*Chlamydia trachomatis*) [23]. There is no population-based STD estimate among FSW in Hong Kong, but it is speculated to be lower than that in mainland China.

It was also interesting that even among the clients of mainland Chinese FSW who always used condoms, approximately 4% of them still reported STD infection in the past 6 months (compared with 0.6% for those consistent condom users who patronized FSW in places other than mainland China). Although this may be caused by a difference in infectivity, it is more likely to be related to the lower quality of condoms available in mainland China. A report published by the Consumer Council in Hong Kong has warned that condoms obtained from mainland China are often sub-standard [24].

With the increasing prevalence of HIV in the Pearl Delta Region and the observed ‘bridging effects’, it is uncertain whether the low HIV prevalence in Hong Kong will be maintained. The results of this study substantiate concerns over the bridging effect on the

future trajectory of the HIV epidemic in Hong Kong. To increase the number of consistent condom users in mainland China is, therefore, a high priority of AIDS prevention workers in Hong Kong. A regional approach needs to be taken. Interventions for cross-border commercial sex clients inside mainland China would be more effective than education campaigns targeted at the general population. However, programmes should not only target Hong Kong male commercial sex clients; educating and empowering Chinese FSW is of equal importance. Such regional efforts have been very minimal, although their importance has been realized [16]. The study pinpoints the direction of future HIV prevention work in Hong Kong; however, the relevance to the mainland China side is also self-evident.

The study has some limitations. It is subjected to all the disadvantages related to telephone surveys (although telephone surveys are often used for surveys on sexual behaviour). The response rates of the studies were approximately 45%. Although relatively low, they were comparable with those of other telephone surveys conducted in Hong Kong [25–28]. In the present study, approximately 90% of those who started the interview completed it, despite the sensitive nature of the questions. It is thus unlikely that most of the non-responses were related to the topic of the study. Good internal validity should exist because we were only comparing the prevalence of condom use and STD by the location of commercial sex activity among respondents who had already identified themselves as commercial sex clients, rather than estimating the prevalence of commercial sex behaviours, condom use, and STD, etc., which are much more sensitive to reporting bias. There is little reason to believe that those who engaged in commercial sex activity in mainland China would be less willing to reveal their condom use practices than those who engaged in commercial sex activity in Hong Kong.

Another study [12] showed that the majority of cross-border commercial sex clients were only day-trippers or those who travelled for only a few days, and because the recall of risk behaviours was of a 6-month duration, it is unlikely that clients of cross-border commercial sex workers would have a substantially lower response rate.

Because of the nature of the study, detailed questions about condom use were not asked. Moreover, STD history was self-reported, and it is not known whether different types of STD were found in different places. Despite these limitations, the study has brought some original insights to the regional STD/HIV problem.

The strength of the study lies in the sizeable sample of commercial sex clients who had patronized FSW in different places. Another strength is that the respon-

dents were obtained from a population-based random sampling method and a special data collection method was used to reduce reporting bias [19]. The consistency of the data obtained for the three surveys suggested good data reliability. The study may be the first of this kind in Asia. Further research to understand the underlying causes of the observed geographical differences is also of great importance.

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