

Declining Inconsistent Condom Use but Increasing HIV and Syphilis Prevalence Among Older Male Clients of Female Sex Workers

Analysis From Sentinel Surveillance Sites (2010–2015), Guangxi, China

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Abstract: Clients of female sex workers (CFSWs) are a bridge population for the spread of HIV and syphilis to low or average risk heterosexuals. Most studies have examined the point prevalence of these infections in CFSWs. Limited evidence suggests that older age CFSWs are at a higher risk of acquiring sexually transmitted diseases compared with younger clients. Thus, we sought to describe long-term trends in HIV, syphilis, and hepatitis C (HCV) to better understand how these infections differ by sex worker classification and client age. We also examined trends in HIV, syphilis, and HCV among categories of female sex workers (FSWs).

We conducted serial cross-sectional studies from 2010 to 2015 in Guangxi autonomous region, China. We collected demographic and

behavior variables. FSWs and their clients were tested for HIV, syphilis, and HCV antibodies. Positive HIV and syphilis serologies were confirmed by Western blot and rapid plasma regain, respectively. Clients were categorized as middle age (40–49 years) and older clients (≥ 50 years). FSWs were categorized as high-tier, middle-tier, or low-tier based on the payment amount charged for sex and their work venue. Chi-square test for trends was used for testing changes in prevalence over time.

By 2015, low-tier FSWs (LTFSWs) accounted for almost half of all FSWs; and they had the highest HIV prevalence at 1.4%. HIV prevalence declined significantly for FSWs (high-tier FSW, $P = 0.003$; middle-tier FSWs; $P = 0.021$; LTFSWs, $P < 0.001$). Syphilis infections significantly declined for FSWs ($P < 0.001$) but only to 7.3% for LTFSWs. HCV and intravenous drug use were uncommon in FSWs. HIV prevalence increased for older age clients (1.3%–2.0%, $P = 0.159$) while syphilis prevalence remained stable. HCV infections were halved among older clients in 3 years (1.7%–0.8%, $P < 0.001$). Condom use during the last sexual encounter increased for FSWs and CFSWs. Few clients reported sex with men or intravenous drug use. Clients preferred LTFSWs, especially older clients (81.9%).

Our results suggest that HIV and syphilis infections are increasing in older clients who prefer LTFSWs. HIV and syphilis are likely increasing in Guangxi Province through heterosexual transmission.

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Abbreviations: CDC = Chinese Centers for Disease Control and Prevention, FSWs = female sex workers, HCV = hepatitis C, HIV = human immunodeficiency virus, LTFSWs = low-tier female sex workers.

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INTRODUCTION

In 2014, heterosexual transmission contributing to 66.4% of HIV cases.¹ Female sex workers (FSWs) are a key bridging population for the spread of HIV to the heterosexual population through their clients.² Trends point to a decline in the national prevalence of HIV, syphilis, and HCV among FSWs, which is likely driven by their increased use of preventive services and consistent condom use.^{3,4} The burden of STDs, however, has declined unevenly among FSWs: a meta-analysis estimated the pooled prevalence of HIV in high, middle, and low-tier FSWs (LTFSWs) as 0.59%, 0.92%, and 1.10%, respectively.³ LTFSWs are solicited on the street or at outdoor public places and charge a low fee for their services. The HIV and syphilis prevalence among LTFSWs has been estimated as 1.1% and 3.9%.^{3,4} LTFSWs use condoms inconsistently compared with other types of FSWs.⁵

Solicitation of prostitutes by men in China is relatively common. According to Pan et al,² 7.0% of urban men and 1.8% of rural men visited FSWs in the last year. The typical Chinese client has a regular noncommercial partner.⁶ Clients of FSWs are at high risk for sexually transmitted diseases (STDs). They tend to have insufficient knowledge regarding STD transmission routes, perceive a low risk of acquiring STDs, and they use condoms inconsistently.^{7–11} McLaughlin et al⁶ estimated that clients of FSWs are at 12 times the risk of acquiring HIV compared with the general population. Clients of FSWs use condoms more frequently with FSWs than their noncommercial partners, which may explain their important role as vectors of STDs to low to average risk heterosexuals.^{12,13}

Guangxi, in southern China, accounts for approximately 10% of reported HIV cases in China.¹⁴ Ninety-three percent of persons living with HIV/AIDS in Guangxi Province acquire HIV through heterosexual practices.¹⁴ FSWs share a high burden of STDs. HIV prevalence among LTFSWs was reported as 2.2% in 2014.¹⁵ Older men are particularly at risk for STDs due to their frequent visits to FSWs. In 2014, 46% of all HIV cases occurred in men over 50 years of age.¹⁴

Although the prevalence of HIV, syphilis, and HCV for individual years has been measured,¹⁶ the true burden of disease and the effectiveness of control measures over the long-term is unknown. Therefore, there we explore how HIV, syphilis, and HCV prevalence differ by sex worker classification and client age over 6 years. The findings from our study will better inform STD control measures for female sex workers and their male clients.

METHODS

Study Design and Study Participants

Serial cross-sectional studies were conducted yearly for surveillance purposes from 2010 to 2015, in all 14 prefectures and 64 city or county regions in Guangxi, China. The number of surveillance sites increased from 55 in 2010 to 84 by the end of 2015. Our sampling strategy included dedicating a site for surveying FSWs at every city or county region whereas 30% of cities or county regions were selected for surveying clients. The study protocol was developed by the Guangxi Center for Disease Control and Prevention (CDC) in accordance with national guidelines.¹⁷ Study participants included FSWs and their male clients. Eligibility criteria required FSWs to be at least 18 years old and clients to be 40 years of age. To be eligible, participants had to provide informed consent. History of sex work or solicitation of FSWs was by self-report. Sex work venues at each surveillance site were systematically mapped by an experienced outreach worker. The outreach worker subsequently recruited male clients to participate through providing study brochures and verbal encouragement. Outreach workers also invited clients, FSWs, and brothel managers to refer other male clients to the study. Those who met the screening criteria then completed an interview questionnaire and received HIV pretest counseling. Data quality was assured by assigning a noninterviewing staff member to examine questionnaires for errors, blanks, or inconsistent data. Participants were also given HIV post-test counseling when they returned for their HIV test results. The detailed study protocol is described elsewhere.^{17–19}

Data Collection

Study participants were assigned a unique identifier number to collect data confidentially. Demographic variables collected included age, sex, ethnicity, marital status, and

education. Behavioral variables were collected on unprotected sex with male clients or FSWs and prior sex with men. Variables on drug and IV drug use were also collected. Data on HCV infections among male clients was only available from 2013 to 2015. FSWs were categorized as high, middle, and low-tier FSWs according to the sex work venues where they solicit their clients. High-tier FSWs were from karaoke bars, bathhouses, or hotels; middle-tier FSWs were from hair salons, barbershops, massage parlors, foot bathing shops, roadside shops, guest-houses, or roadside restaurants; and LTFSWs were street based or worked in public outdoor places. Clients were categorized as middle age (40–49 years) and older clients (≥ 50 years).

Laboratory Methods

Blood samples were collected from all participants for serologic testing for HIV, syphilis, and HCV. Blood samples were tested for HIV antibodies with an enzyme-linked immunosorbent assay (ELISA). Western blot testing was conducted to confirm positive HIV ELISA results. For syphilis, all specimens were tested with ELISA and rapid plasma reagin testing in parallel. Patients with positive results on both tests were considered to have syphilis. Samples were tested for HCV antibodies by ELISA.

Statistical Analysis

Questionnaires and laboratory testing data were double entered and validated with EpiData software (EpiData 3.0 for Windows; The EpiData Association Odense, Denmark). Data were then transferred into SPSS software (version 17.0; SPSS Inc, Chicago, IL). Univariate proportions and means were calculated for categorical and continuous variables, respectively. The descriptive and Chi-square test for trends were used for categorical and continuous variables, respectively. $P < 0.05$ was considered statistically significant, and all tests were two sided.

Ethics Statement

The institutional review board of the Guangxi CDC approved this study of secondary surveillance data analysis.

RESULTS

Female Sex Workers

Table 1 shows the characteristics of FSWs surveyed ($N = 120,049$). The majority of sex workers were < 35 years of age, married/cohabiting, of Han ethnicity, and with > 6 years of education. The number of FSWs increased over 2010 to 2015. LTFSWs increased from 5095 to 10686; by the end of 2015, they comprised the majority of FSWs.

The prevalence of HIV in FSWs ranged from 1.9% for LTFSW in 2010 to 0.1% for high tier FSWs in 2014. Among FSWs, LTFSWs had the highest prevalence of HIV (Figure 1). HIV prevalence declined among LTFSWs over 2010 to 2013 ($P < 0.001$) but slightly increased by 0.3% from 2014 to 2015. Syphilis prevalence decreased across all categories of FSWs ($P < 0.001$) but began to increase slightly for LTFSWs starting in 2014 (Figure 1). The prevalence of syphilis peaked at 11.3% in 2011 for LTFSWs. HCV prevalence decreased among middle tier and LTFSWs ($P = 0.02$, $P < 0.001$, respectively). From 2010 to 2015, there was a substantial and significant increase in protected sex among all FSW tiers ($P < 0.001$). Consistent condom use by LTFSWs increased by 13.8% in 6 years; at the end of 2015, only 4.5% of LTFSWs reported using condoms

TABLE 1. Demographic and Behavioral Characteristics by Survey Year Among FSWs in Guangxi, China, 2010 to 2015 (N = 120,049)

Year	2010	2011	2012	2013	2014	2015	P
	16,155	17,615	18,020	23,234	22,566	22,459	
Age, y							<0.001
<35	13,547 (83.9)	14,130 (80.2)	13,607 (75.5)	15,336 (66.0)	14,430 (63.9)	13,217 (58.8)	
≥35	2608 (16.1)	3485 (19.8)	4413 (24.5)	7898 (34.0)	8136 (36.1)	9242 (41.2)	
Married/cohabiting							<0.001
Yes	7258 (45.0)	7288 (41.5)	6035 (33.5)	14,592 (62.9)	14,464 (64.1)	15,275 (68.0)	
No	8872 (55.0)	10,274 (58.5)	11,964 (66.5)	8620 (37.1)	8094 (35.9)	7178 (32.0)	
Ethnicity							<0.001
Han	9264 (58.1)	9923 (57.3)	10,083 (56.7)	12,661 (54.5)	12,621 (57.0)	12,278 (54.7)	
Zhuang	5268 (33.1)	5943 (34.3)	5784 (32.5)	7722 (33.2)	7140 (32.2)	7456 (33.2)	
Other	1404 (8.8)	1464 (8.4)	1906 (10.7)	2851 (12.3)	2379 (10.7)	2725 (12.1)	
Education							<0.001
≤6 y	4937 (30.7)	5634 (32.1)	6539 (36.3)	8559 (36.9)	8368 (37.1)	8702 (38.8)	
>6 y	11,167 (69.3)	11,910 (67.9)	11,453 (63.7)	14,641 (63.1)	14,184 (62.9)	13,752 (61.2)	
FSW category*							<0.001
High tier	1756 (13.1)	2007 (11.4)	1714 (9.5)	2045 (8.8)	1922 (8.5)	1832 (8.2)	
Middle tier	6591 (49.0)	8761 (49.8)	7818 (43.5)	10,409 (44.9)	10,677 (47.3)	9938 (44.3)	
Low tier	5095 (37.9)	6829 (38.8)	8440 (47.0)	10,729 (46.3)	9956 (44.1)	10,686 (47.6)	
HIV+							
High tier	11 (0.6)	7 (0.3)	7 (0.4)	4 (0.2)	2 (0.1)	3 (0.2)	0.003
Middle tier	31 (0.5)	51 (0.6)	37 (0.5)	35 (0.3)	37 (0.3)	38 (0.4)	0.021
Low tier	96 (1.9)	130 (1.9)	155 (1.8)	167 (1.6)	108 (1.1)	150 (1.4)	<0.001
Syphilis+							
High tier	46 (2.6)	69 (3.4)	59 (3.4)	43 (2.1)	29 (1.5)	25 (1.4)	<0.001
Middle tier	290 (4.4)	432 (4.9)	326 (4.2)	417 (4.0)	341 (3.2)	307 (3.1)	<0.001
Low tier	466 (9.2)	770 (11.3)	899 (10.7)	996 (9.3)	685 (6.9)	776 (7.3)	<0.001
HCV+							
High tier	10 (0.6)	12 (0.6)	10 (0.6)	8 (0.4)	3 (0.2)	12 (0.7)	0.395
Middle tier	62 (0.9)	60 (0.7)	69 (0.9)	93 (0.9)	84 (0.8)	51 (0.5)	0.022
Low tier	61 (1.2)	97 (1.4)	116 (1.4)	118 (1.1)	76 (0.8)	79 (0.7)	<0.001
Unprotected sex (last sex act)							
High tier	194 (11.0)	268 (13.4)	70 (4.1)	54 (2.6)	39 (2.0)	13 (0.7)	<0.001
Middle tier	713 (10.8)	1024 (11.7)	501 (6.4)	300 (2.9)	189 (1.8)	157 (1.6)	<0.001
Low tier	932 (18.3)	1087 (15.9)	818 (9.7)	836 (7.8)	472 (4.7)	480 (4.5)	<0.001
Prior drug use (anytime)							
High tier	107 (6.1)	129 (6.4)	92 (5.4)	103 (5.0)	77 (4.0)	45 (2.5)	<0.001
Middle tier	212 (3.2)	228 (2.6)	135 (1.7)	145 (1.4)	123 (1.2)	118 (1.2)	<0.001
Low tier	98 (1.9)	129 (1.9)	80 (0.9)	109 (1.0)	102 (1.0)	46 (0.4)	<0.001
Past IV drug use (anytime)							
High tier	1 (0.1)	3 (0.1)	1 (0.1)	8 (0.4)	2 (0.1)	1 (0.1)	<0.001
Middle tier	36 (0.5)	27 (0.3)	28 (0.4)	20 (0.2)	29 (0.3)	11 (0.1)	<0.001
Low tier	24 (0.5)	41 (0.6)	28 (0.3)	36 (0.3)	26 (0.3)	15 (0.1)	<0.001
Used prevention services in the last year							
High tier	1481 (84.4)	1646 (83.9)	1500 (87.6)	1924 (94.2)	1759 (91.6)	1757 (96.0)	<0.001
Middle tier	5697 (86.5)	7708 (89.9)	7360 (94.2)	9987 (96.0)	10,291 (96.4)	9676 (97.4)	<0.001
Low tier	4328 (85.0)	5806 (86.2)	7634 (90.5)	10,340 (96.4)	9489 (95.4)	10,451 (97.8)	<0.001

Values are given as n (%). P values are for χ^2 test of trend. Approximately 20% of FSW repeated the survey. FSW = female sex worker, HCV = hepatitis C virus, IV = intravenous.

*FSWs were categorized by work venue. Condom promotion and distribution, and HIV counseling and testing.

inconsistently. Use of preventive services such as HIV testing also rose for all categories of FSWs during this time and was above 80% for all years ($P < 0.001$). Non-IV drug use among FSWs decreased from 2010 to 2015 ($P < 0.001$). IV drug use was essentially unchanged over the 6 years of the survey and remained <1% for all FSWs (Table 1).

Clients of Female Sex Workers

Table 2 shows the characteristics of clients of FSWs (N = 23,914). The majority of clients were classified as older. Most were married, of Han ethnicity, and had 6 years of education or less. The prevalence of HIV fluctuated in older clients: in 2012 it was 1.3%, peaked at 2.1% in 2013, decreased

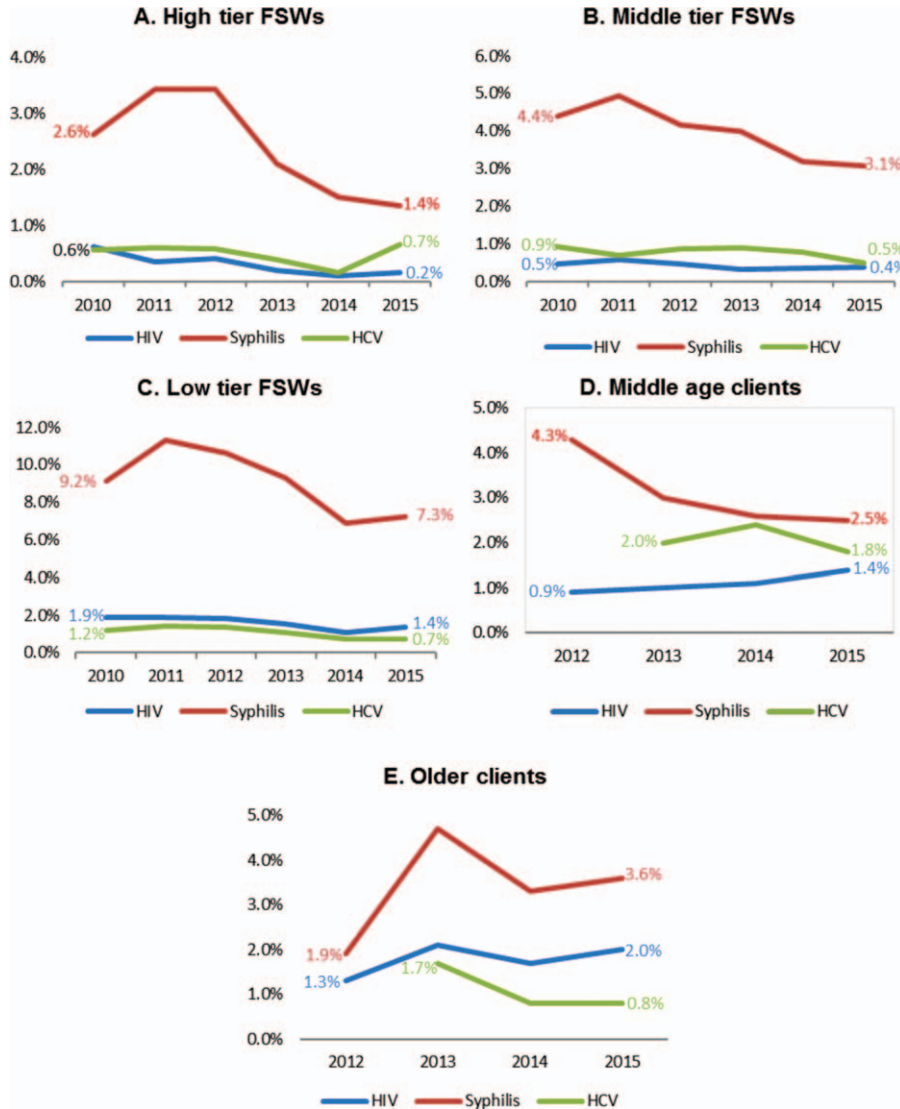


FIGURE 1. Prevalence of HIV, syphilis, and hepatitis C over time for FSWs and their clients taken from serial surveys, Guangxi, China, 2010–2015. FSWs were categorized according to the sex work venues where they solicit their clients. Clients were categorized as middle age (40–49 years) and older clients (≥ 50 years). Data on HCV prevalence was only available for clients of FSWs from 2013–2015. FSWs = female sex workers, HCV = hepatitis C virus.

to 1.7% in 2014, and increased to 2.0% in 2015 (Figure 1) ($P = 0.159$). Although not statistically significant, there was a small and steady increase in HIV prevalence in middle age clients. Except for 2012, the majority of syphilis infections occurred among older clients. Trends pointed to a decrease in syphilis among middle age clients by 1.3% over 2012 to 2013 and slower declines in subsequent years ($P < 0.001$). From 201 to 2015, the prevalence of HCV was more than halved among older clients ($P < 0.001$) and slightly declined for middle age clients ($P < 0.001$). Protected sex increased ($P < 0.001$), especially for older clients who improved their condom use by 10% over the study period. Less than 1% of clients reported having sex with men or intravenous drug use. Clients preferred LTFSWs. Older clients preferred LTFSWs more so than middle age clients (81.9% vs 58.4%, respectively) (Table 2).

DISCUSSION

Our research suggests that important gains in the control of HIV, syphilis, and HCV were made for FSWs from 2010 to 2015 in Guangxi Province, which is likely a result of increased use of condoms and preventive services. Notably, inconsistent condom use decreased in LTFSWs from 18.3% in 2010 to 4.5% in 2015. For comparison, a 2012 study by Zhang et al⁵ reported that around 34% of LTFSWs used condoms during their last paid sex act. Radio, television, and newspaper advertisements have helped to raise awareness on HIV prevention for women of reproductive age, which has likely improved consistent condom use.^{20,21} Perhaps, increased exposure to media sources or outreach programs fostered a greater awareness on the importance of using condoms consistently to prevent HIV among FSW in our sample. Other factors, however, may explain the decline in

TABLE 2. Demographic and Behavioral Characteristics by Survey Year Among Clients of FSWs in Guangxi, China, 2010 to 2015 (N = 23,914)

Year	2012	2013	2014	2015	P
	4260	6629	6525	6500	
Age, y					<0.001
40–49	1955 (45.9)	2678 (40.4)	2613 (40.0)	2563 (39.4)	
≥50	2305 (54.1)	3951 (59.6)	3912 (60.0)	3937 (60.6)	
Married or cohabiting					<0.001
Yes	3402 (79.9)	5088 (76.8)	5342 (81.9)	5035 (77.5)	
No	857 (20.1)	1541 (23.2)	1177 (18.1)	1460 (22.5)	
Ethnicity					<0.001
Han	3001 (70.4)	4901 (73.9)	4806 (73.7)	4736 (72.9)	
Zhuang	1150 (27.0)	1465 (22.1)	1430 (21.9)	1445 (22.2)	
Other	109 (2.6)	263 (4.0)	289 (4.4)	319 (4.9)	
Education, y					<0.001
≤6	2152 (50.5)	3377 (51.0)	3120 (47.9)	3378 (52.0)	
>6	2108 (49.5)	3249 (49.0)	3391 (52.1)	3119 (48.0)	
HIV+					
Older age	29 (1.3)	83 (2.1)	66 (1.7)	80 (2.0)	0.159
Middle age	18 (0.9)	26 (1.0)	30 (1.1)	35 (1.4)	0.113
Syphilis+					
Older age	44 (1.9)	184 (4.7)	129 (3.3)	143 (3.6)	0.131
Middle age	84 (4.3)	80 (3.0)	69 (2.6)	64 (2.5)	<0.001
HCV+					
Older age	—	66 (1.7)	31 (0.8)	30 (0.8)	<0.001
Middle age	—	53 (2.0)	62 (2.4)	46 (1.8)	<0.001
Unprotected sex					
Older age	884 (38.4)	1260 (31.9)	1301 (33.3)	1006 (28.4)	<0.001
Middle age	500 (25.6)	533 (19.9)	641 (24.5)	399 (16.7)	<0.001
Prior sex with men					
Older age	4 (0.2)	5 (0.1)	1 (0.0)	4 (0.1)	0.030
Middle age	4 (0.2)	6 (0.2)	4 (0.2)	9 (0.4)	0.012
Prior IV drug use					
Older age	18 (0.8)	30 (0.8)	12 (0.3)	8 (0.2)	0.005
Middle age	35 (1.8)	57 (2.1)	71 (2.7)	12 (0.5)	0.084

Clients’ Preferences by Age

	Older Age	Middle Age
High-tier female sex workers	161 (1.1)	391 (4.0)
Middle-tier female sex workers	2393 (17.0)	3691 (37.6)
Low tier-female sex workers	11,547 (81.9)	5726 (58.4)

Values are given as n (%). P values are for χ^2 test of trend. Older age clients were defined as ≥50 years of age and middle age clients as 40 to 49 years of age. Sex workers were categorized by the venue that they solicited their clients. Less than 5% of clients repeated the survey. HCV = hepatitis C virus, IV = intravenous.

HIV and syphilis we observed, such as increased availability of treatment.

We found that the frequency of protected sex increased by 10% for older clients and 8.9% for middle age clients. At the end of 2015, 28.4% of older clients and 16.7% of middle age clients reported using a condom at their last paid sex encounter. For comparison, a 2010 study found that 33.7% of clients in Yunnan Province reported using a condom during their prior paid sex act.⁸

Surprisingly, over only 4 years, the prevalence of HIV increased by 0.5% for middle age clients and by 0.7% for older clients. Few studies report on long-term trends in HIV or syphilis prevalence in clients of FSWs in China. Thus, we compare our results for individual years to other studies to

provide a benchmark. A study of clients of FSWs from a rural county of Guangxi Province in 2011 found that most clients were older (mean age 61.8 years) and that the prevalence of HIV and syphilis were 1.9% and 18.4%, respectively.²² The 2012 HIV prevalence in older clients in our sample (1.3%) was lower than that reported by Wu et al²³ (2.9%). The prevalence of syphilis decreased among middle age clients but increased among older clients. The prevalence of syphilis among older clients in Guangxi Province in our sample was similar to that found by Lu et al¹⁶ (3.3% vs 3.4%) from 2012 to 2013. Of note, older clients in the Lu et al study were defined as 60 years and older whereas in our study we defined an older client as 50 years and above. These studies used different sampling strategies as well as choice of locations. These differences may explain the

higher prevalence of HIV found in our study. In our study the rates of HIV and syphilis among clients >60 years ranged from 1.9% to 2.7% and 4.2% to 8.1%, respectively.

We anticipated a decline in HIV among clients of FSMs. The fall of intravenous drug use by clients, their increased condom use, as well as increased protective sex by FSM should have contributed to declining rates. Further, we also expected these positive behavior changes to decrease syphilis rates among older clients of FSMs. One possibility that HIV and syphilis rates did not decline as anticipated is that clients have changed their preferences for LTFSWs. Many older clients are from rural areas and may have relocated to cities for economic reasons. These migrants may prefer LTFSWs because of their low cost. In addition, China has increasingly cracked down on the illegal sex trade. Perhaps, clients have changed their preferences to LTFSWs workers because they perceive a lower risk for arrest outside compared with enclosed spaces such as karaoke bars. Further, we observed that the number of LTFSWs more than doubled over the survey period, which could reflect that we added survey sites each year. In addition, increased awareness about free preventive services may have drawn LTFSWs to the survey sites. Men who visit LTFSWs are less likely to practice safe sex than those who visit high tier FSWs.^{24,25} Increasing visits to LTFSWs may have increased clients' susceptibility to STDs given that LTFSWs have a high burden of STDs relative to other tiers of FSWs. That older clients had a greater preference for LTFSWs and higher rates of HIV and syphilis than middle age clients lends support to our hypothesis. Finally, older clients may be at greater risk than younger clients because of use of aphrodisiacs, which were found to be a risk factor for inconsistent condom use and HIV infection in Guangxi.²⁶ Further studies are needed to understand the increase in HIV infections among clients and the parallel decrease in LTFSWs. To better understand the role that clients of FSWs play as a bridging population, research is needed on their risk behaviors, preferences for FSWs, motivation for buying sex, and substance abuse.

Our study faced the following limitations. First, we were unable to calculate incidence and thus the risk of HIV, syphilis, or HCV over time. Second, it is possible that we underestimated the true prevalence of HIV among FSWs as they are a highly mobile population who may exit sex work to pursue other occupations. Third, serial surveys inquired only about intravenous drug use in clients: Knowledge on alcohol and noninjectable illicit drugs would have allowed us to better characterize substance abuse among clients of FSWs. Fourth, we did not inquire about client preferences. Therefore, we could not adequately explain why older clients overwhelmingly preferred LTFSM. Fifth, relying on surveillance data and increasing the number of surveillance sites may have overestimated the prevalence of HIV in clients through detection bias. Nevertheless, surveillance data show a steady increase in HIV among older men.²⁷ Finally, we were not able to make any firm conclusions regarding trends in HCV prevalence for clients because they were only tested over 3 years.

In conclusion, we found increased condom use among FSWs and their clients. Compared with FSWs, clients used condoms less frequently. This may reflect that there are fewer targeted HIV outreach efforts for clients compared with FSWs. Although HIV rates declined among FSWs, there was an unexpected increase in HIV among clients. The prevalence of syphilis decreased among all groups surveyed except older clients. Possibilities for these observations may include increased susceptibility to STDs mediated through greater

reliance on relatively higher risk LTFSWs workers. Further research should focus on ways to increase condom use among clients of FSWs.

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