Predictors for casual sex and/or infection among sexually transmitted disease clinic attendees in China

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Summary

To assess the risk factors for casual sex and infections among the sexually transmitted disease (STD) clinic attendees in two disparate Chinese cities, an STD clinic-based cross-sectional study was conducted to provide demographic and sexual behaviour information. Participants were recruited from nine STD clinics selected by mapping strategy. STD prevalence was 69.4% (68.6% of men and 65.2% of women). The most common diagnoses were non-gonococcal urethritis (22.2%), genital warts (13.2%), syphilis (11.6%), gonorrhoea (8.4%), chlamydia (6.3%) and herpes simplex virus type 2 (HSV-2) (5.8%). Of 536 participants, 22.5% reported having casual sex in the last three months, younger age, less education, unawareness of transmission routes and having had casual sex in the last three months were independent risk factors for acquisition of an STD. Single or separated marital status, non-local residency and STD diagnoses were independently associated with having had casual sex. After decades of exceedingly low STD rates in China, a full panoply of STD diagnoses are now evident. Both for reproductive health concerns and for stemming the expansion of HIV spread, STD control and prevention must be revitalized as a priority for China's public health and medical institutions. Effective training is a priority, given the dearth of STD-experienced health-care workers.

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Keywords

risk factors; STD; casual sex; STD clinic attendee; China

Introduction

China nearly eliminated sexually transmitted diseases (STDs) in the 1960s; however, the number of reported STD cases has risen dramatically with the initiation of economic reform in the early 1980s.[1–4] The number of newly infected STD cases nationwide increased ≈20% annually between 1989 and 1998. By 2004, a total of 742,022 new STD cases (including gonorrhoea, syphilis, non-gonococcal urethritis [NGU], genital herpes, genital warts, chancroid and lymphogranuloma venereum) were reported: syphilis accounted for 10.9% of the reported STD cases. Historically, the majority of STD infections were contracted through unprotected sexual contact with their heterosexual partners.[5,6] STDs, especially ulcerative diseases such as syphilis and genital herpes, are of particular concern because they facilitated the transmission of HIV infection.[7–9] HIV, in turn, may increase the acquisition of other STDs and alter the natural history and response to standard therapy of ulcerative STDs, resulting in an 'epidemiological synergy' between HIV and STDs.[8,9]

In China, the scope and danger of unprotected sex varies with the socioeconomic, cultural, geographic and environmental factors prevalent in different parts of the country. A population-based survey found that 9% of Chinese men had paid for sex during the last year[10] and a literature review suggests low rates of condom use in China.[5] Within-country migration of historic proportions has increased sexual risk among a subgroup of rural-to-urban migrants, who may serve as a bridging population for HIV transmission.[11–17] The overlap between at-risk groups, e.g. between injecting drug users (IDUs) and female sex workers (FSWs), in some parts of China, has the potential to spread heterosexual HIV infection.[18,19]

Since the late 1980s, China's National STD Sentinel Surveillance Program has been monitoring the prevalence of STDs among four population groups: FSWs, long-distance truck drivers, blood donors and antenatal clinic attendees.[1–3] Since 1995, China's National HIV Sentinel Surveillance Program has been tracking the prevalence of HIV among female sex workers, drug users, long-distance truck drivers, pregnant women, STD clinic attendees and blood donors.[1–3,20–22] Epidemiological studies report a wide range of STD prevalence among STD clinic attendees in China. The disparity may result from varying sampling strategies and diagnostic capacities, but is also very likely to reflect local conditions in different geographic venues. Additionally, only a few behavioural surveys among STD clinic attendees have ever been conducted.[17,23,24] In order to estimate the prevalence of STDs and assess the risk factors of casual sex and/or infection among STD clinic attendees, we conducted this clinic-based study in two disparate cities in China: Bengbu city, Anhui Province and Guiyang city, Guizhou Province.

Methods

Study settings

Guizhou Province hosts 35 million people with a large proportion of minority ethnic groups, located in southwest China. Guizhou Province is adjacent to Sichuan, Yunnan, Guangxi and Hunan, with IDUs as the predominant transmission routes for HIV.[21] Guizhou, which is along the drug trafficking route, has about 30% HIV prevalence rates among drug users. Guiyang city, capital of Guizhou, has five districts, one county-level city and three counties under its jurisdiction with a population of 3.2 million. Anhui Province is located in Eastern China and has a population of 62 million. Anhui is adjacent to Jiangsu, Zhejiang, Jiangxi, Hubei, Henan

and Shandong. The majority of HIV cases in these provinces were among farmers and former commercial blood plasma donors.[21] Bengbu city in northern Anhui is one of the biggest cities in this province, with four districts, three counties and 3.5 million people.

Sampling

Clinic-based surveys were conducted in January 2005 among STD clinic attendees in Bengbu and Guiyang. Group discussions with the key informants, in-depth interviews with selected STD clinic attendees in the study sites and geographic mapping of all STD clinics were conducted in the study cities, and the numbers of STD clinic visitors at each clinic were assessed. All STD clinics were classified into three groups: (1) comprehensive hospital-affiliated clinics, (2) specialized hospital-affiliated clinics or specialized clinics, and (3) private clinics. The study clinics were selected from these three groups. No less than 30% of participants were recruited from each group. In Bengbu, five STD clinics were selected: three clinics were located in large, comprehensive hospitals, one in an infectious disease hospital and one in an STD-specialized hospital. In Guiyang, four STD clinics were selected: one clinic was located in a comprehensive hospital, one in an STD-specialized hospital, one was a private STD clinic and one was the Guiyang STD clinic within the prefecture-level Provincial Center for Disease Control and Prevention (CDC).

Participants

All potential participants in each selected clinic were invited to attend eligibility assessments and interviews in the same clinic. The trained health professionals conducted the interviews in a separate room in this clinic, within a comfortable environment for the study participants. Survey information was collected anonymously and remained confidential. A common standard procedure was implemented in the two sites. Eligibility criteria included willingness to participate and to sign a written informed consent form, age ($\geq$15 years old) and attending the selected STD clinic for the first time for treatment or testing. Exclusion criteria included people consulting the selected STD clinic for sexual knowledge as opposed to symptoms and people seeing physicians for dermatitis only. These clinic attendees were either self-referred or physician referred because of suspected STDs. Written informed consent was obtained from all study participants before being interviewed. The study was approved by the Institutional Review Boards (IRB) of the National Center for AIDS/STD Control and Prevention of the China CDC and the IRB of Vanderbilt University.

Data Collection

Structured questionnaire-based interviews provided sociodemographic variables, HIV knowledge, practice and sexual behavioural information. Sociodemographic variables included sex, age, marital status, residency, ethnicity, education and self-reported monthly income. HIV knowledge, practice and sexual behaviour information included awareness of the three major transmission routes (blood, sexual and mother to child), willingness to use condoms, knowledge of where to access HIV testing, ever having been tested for HIV, condom use with a regular or casual sex partner in the last sexual encounter and over the last three months, living with a regular sexual partner, ever having had a casual sexual encounter and the number of casual sex partners in the last three months. Interviews were conducted by staff trained in sexual history-taking. Regular meetings were held to discuss the progress of the survey and any special problems encountered. To ensure confidentiality, participants were assured that their information through the interviewer-administered questionnaire would remain confidential. After completing the questionnaire, the participants were tested for syphilis and HIV. Pre- and post-test counselling was conducted in a private room within the clinic.

Laboratory testing

All collected serospecimens were transported to provincial-level CDC laboratories for HIV and syphilis testing. An algorithm of a screening test using an enzyme-linked immunoassay (ELISA, Beijing Jinhao Biologic Production Co., Beijing, China) and a confirmatory test using the HIV-1/2 Western blot immune assay (HIV Blot 2.2 WB; Genelabs Diagnostics, Singapore) were applied for HIV. Antibody to *Treponema pallidum* antigen was screened by a positive rapid plasma reagin (RPR) test (Macro-Vue RPR™ Card Test, Becton-Dickinson, Franklin Lakes, NJ, USA). All HIV and syphilis testing was performed at the provincial CDCs. Sterile cotton-tipped swabs used to collect the material from the base of the genital lesion were tested for HSV-2. Urine specimens collected from each patient at the clinic who had a urethral discharge were tested for *Neisseria gonorrhoeae, Chlamydia trachomatis, Ureaplasma urealyticum, Mycoplasma hominis* and *Mycoplasma genitalium*. Various methods and testing reagents were performed in different STD clinics for diagnoses with the exception of HIV and syphilis, which were tested with the common methods at the CDC. Testing methods for *N. gonorrhoeae* included Gram stain and/or culture/polymerase chain reaction (PCR). Clinical diagnoses, combined with direct fluorescent antibody, ELISA and/or PCR, were applied for determining the infection status of *C. trachomatis, U. urealyticum, M. hominis* and *M. genitalium*. ELISA and/or PCR were applied for HSV-2. Genital warts and chancroid were diagnosed by clinical examination.

Statistical analysis

Data were recorded using Microsoft Excel™ (Edition 2003, Microsoft Corporation, Redmond, WA, USA) and validated through double entry. Univariate and multivariable logistic regression analyses were performed using Statistical Package for the Social Sciences (SPSS15.01™, SPSS Inc., Chicago, IL, USA) to evaluate the risk factors for casual sex and/or infection among STD clinic attendees. Only variables that were significant in univariate analyses at $P < 0.1$ were included in multivariable logistic regression models for selecting the independent risk factors for casual sex and STDs. Outcome variables included the prevalence of HIV/STD and having had a casual sex encounter in the past three months. The same statistical analyses were conducted for each city and the two cities combined.

Results

Sociodemographic characteristics

A total of 536 eligible participants were recruited in this study: 277 participants were recruited from five clinics in Bengbu and 259 from four clinics in Guiyang. In Bengbu and Guiyang, respectively, 70.8% and 78.0% of the participants were men, 79.4% and 78.1% were married or cohabited, 97.7% and 93.2% were Han Chinese, 60.9% and 52.2% were <35 years old, 10.8% and 22.0% had a college education, and 17.5% and 43.8% had >1000 yuan monthly income (Table 1).

HIV/AIDS knowledge, practice and sexual behaviour

Of the 536 participants in both cities combined, 76.0% (72.9% in Bengbu and 79.6% in Guiyang) were aware of the three major HIV transmission routes. Nonetheless, only 6.2% had received an HIV test, 73.8% (62.1% in Bengbu and 85.2% in Guiyang) indicated their willingness to use a condom in their next sexual encounter and 48.3% reported the knowledge of where to access an HIV test. Among 54.5% of the participants who reported living with regular partners, 27.8% of them reported that they used a condom during their last sexual encounter and only 7.7% reported that they had consistently used a condom in the last three months. Of the participants, 22.0% (12.2% in Bengbu and 32.9% in Guiyang) reported ever having had a casual sex encounter in the last three months and nearly half of them reported

having had ≥2 casual sex partners in the last three months. Only 11.0% reported always using a condom in the last three months (Table 1).

Prevalence of STDs

In this population selected from STD clinics, 67.7% (68.6% of men and 65.2% of women) had an STD diagnosed with the clinical and laboratory tests presented earlier (75.8% in Bengbu and 59.1% in Guiyang; Table 2). The most common diagnoses were NGU (22.2%), genital warts (13.2%), syphilis (11.6%), gonorrhoea (8.4%), chlamydia (6.3%), HSV-2 (5.8%), and gonorrhoea and NGU co-infection (1.7%). Co-infections of gonorrhoea and genital warts (0.8%), syphilis and genital warts (0.6%), NGU and genital warts (0.4%), and HSV-2 and genital warts (0.2%) were diagnosed. No chancroid was diagnosed. Only one participant was infected with HIV in Guiyang, and there were no HIV cases in Bengbu.

Risk factors for acquisition of STDs

In Bengbu, univariate analysis showed that risk factors for a laboratory-confirmed STD included younger age, single or separated marital status, unawareness of HIV transmission routes, willingness to use condoms, knowing where to access HIV testing and having had a casual sexual encounter in the last three months (Table 3). In Guiyang, STD predictors were non-local residency, less education, higher income, knowing where to access HIV testing and having had a casual sexual encounter in the last three months. Independent factors to be associated with acquisition of an STD for the two sites combined were younger age (adjusted odds ratio [AOR] = 1.7; 95% confidence interval [CI]: 1.1–2.6), less education (AOR = 2.8; 95% CI: 1.6–4.6), unawareness of HIV transmission routes (AOR = 2.0; 95% CI: 1.1–3.5) and having had casual sex in the last three months (AOR = 2.4; 95% CI: 1.3–4.5). In Bengbu, younger age (AOR = 2.0; 95% CI: 1.3–3.9), single or separated (AOR = 4.9; 95% CI: 1.2–19.8), unawareness of transmission routes (AOR = 3.2; 95% CI: 1.2–8.3) and willing to use condoms (AOR = 3.8; 95% CI: 1.9–7.8) were independent risk factors for an STD. In Guiyang, being non-Han Chinese (AOR = 6.4; 95% CI: 1.3–32.4), having less education (AOR = 2.8; 95% CI: 1.4–5.5), having a higher income (AOR = 3.1; 95% CI: 1.6–5.9) and having had casual sex in the last three months (AOR = 2.3; 95% CI: 1.1–4.5) were independent risk factors for an STD (Table 3).

Risk factors for casual sex encounters

Predictors in univariate analysis of having had a casual sexual encounter in both cities included non-local residency, single or separated status, high income, knowing where to access HIV testing, ever having received an HIV test and willingness to use condoms (Table 4). Our multivariable logistic regression model that suggested single or separated status (AOR = 2.4; 95% CI: 1.4–4.3), non-local residency (AOR = 2.6; 95% CI: 1.1–6.6) and STD diagnoses (AOR = 1.6; 95% CI: 1.1–7.3) were significantly associated factors for predicting casual sex in the last three months for the two cities combined. In Bengbu, non-local residency (AOR = 4.4; 95% CI: 1.0–22.6), higher income (AOR = 5.0; 95% CI: 1.9–10.1), unawareness of the three routes of HIV transmission (AOR = 4.6; 95% CI: 1.7–12.4), ever having received an HIV test (AOR = 5.0; 95% CI: 1.3–33.0) and not living with a regular sex partner (AOR = 2.3; 95% CI: 1.1–5.0) were independent risk factors for casual sex. In Guiyang, single or separated status (AOR = 3.1; 95% CI: 1.6–6.1), non-local residency (AOR = 3.5; 95% CI: 1.0–11.4), higher income (AOR = 3.1; 95% CI: 1.7–5.1), unawareness of HIV transmission routes (AOR = 3.4; 95% CI: 1.6–7.2) and STD diagnoses (AOR = 1.2; 95% CI: 1.2–6.3) were independent risk factors for casual sex (Table 4).

Discussion

This study found a high prevalence (67.7%) of STDs among the clinic attendees in the two cities: 75.8% in Bengbu and 59.1% in Guiyang. The most common diagnoses were NGU (22.2%), genital warts (16.4%), syphilis (11.6%), chlamydia (6.3%) and HSV-2 (5.8%). There were 3.7% of participants diagnosed as co-infections between two STDs. Ulcerative diseases (syphilis and genital herpes) were diagnosed at 17.4% (10.1% in Bengbu and 25.1% in Guiyang) in this study.

There was only one participant infected with HIV in Guiyang, and no HIV cases in Bengbu. These findings were consistent with the low rates of HIV infections among STD clinic attendees in sentinel surveillance system in both provinces.[20–22,25] In all, 0.4% (7/1927) of HIV infections was found in two HIV sentinel surveillance sites from 2003 to 2005 in Guizhou Province and 0.06% (2/3098) in five sites in the same period in Anhui Province. These suggested that HIV prevalence in these regions of China is still at a low level among these STD clinic attendees. At the national level, a total of 94,293 attendees from 120 STD clinic-sentinel sites during the same period were tested for HIV, among whom 0.24% (231) were HIV positive; 12 out of the 120 sentinel sites reported >1.0% of HIV-positive cases with the highest rates in Sichuan (2.8%), Beijing (2.3% and 1.5%), Guangxi (2.0%) and Xinjiang (1.8%).[22,25] All of the 31 Chinese provinces, autonomous regions and municipalities with national sentinel sites have detected HIV cases among STD clinic attendees.[22,25] The low rate of HIV infections among STD clinic attendees in this study may relate to the relatively low rates of HIV infections among various groups in these two cities.[25] Three-quarters of the participants in this study were male STD clinic attendees, which are usually regarded as an indicator group for clients of FSWs. Low rates of HIV infections (0.2%) among FSWs were reported in these two cities from 2003 to 2005.[20,22,25] A total of 2524 FSWs from seven sentinel sites in these two provinces during the same period were tested for HIV, among whom 0.4% (10 HIV positive) were HIV positive. This could be another reason why the low rate of HIV infections was found among STD clinic attendees in this study.

Along with the rising prevalence rates of STDs,[1–4] China faces a rapidly increasing risk of HIV through sexual transmission, including both heterosexually through FSWs and homosexually by unprotected sexual behaviour.[5,26] Among an estimated 700,000 people living with HIV in 2007, 40.6% were infected through heterosexual transmission and 11.0% through unsafe sex between men.[26] This underlines the urgency for effective prevention strategies for both HIV and STDs; therefore, it is essential to determine behavioural risk factors that make people vulnerable to STDs and HIV.

In this study, we found that younger age, less education, unawareness of HIV transmission and having had a casual sex encounter in the last three months were independently associated with acquisition of an STD for the two sites combined. The independent risk factors for having casual sex were single or separated marital status and non-local residency for both cities combined. The independent risk factors associated with acquisition of an STD or having casual sex were significantly different between the two cities. This study also indicated a possible correlation between STD diagnoses and having had casual sex in the two sites combined. The STD prevalence was significantly higher among participants who had casual sex in the last three months (82.1%) than those who had not (66.1%; $P < 0.001$).

STDs amplify HIV transmission.[7] The remarkably high prevalence of STDs, especially ulcerative infections, among these STD clinic attendees coinciding with low condom use rates with both regular and casual sex partners emphasizes the gravity of China's epidemic of STDs and the potential impact on expanded heterosexual HIV transmission. Although a high level (76.0%) of awareness of HIV transmission routes indicated some success in education among

this high-risk group, about 90% reported inconsistent or complete lack of condom use with their regular or casual sex partners in the last three months. Also, an extremely low proportion (6.2%) of participants received an HIV test. This suggested that risk reduction education alone cannot help this risk group make lasting behavioural changes. This demonstrated that more effective HIV/STD testing and prevention intervention programmes, e.g. safe sex education, condom distribution and promotion, and partner notification, are urgently needed for this particular risk group. In addition to providing accurate and up-to-date information on risky behaviours, effective prevention programmes not only make condoms available and accessible, but also focus on enhancing individuals' motivation to change their behavioural patterns, teaching concrete strategies and behavioural skills to reduce risk, providing tools for risk reduction and reinforcing positive behaviour change.

Accurate diagnosis and effective treatment for STDs are important in eliminating infectious reservoirs, breaking the chain of infection, and preventing complications and sequelae. Because both genital ulceration and non-ulcerative STDs have a synergistic effect on HIV infection,[9] reducing the duration of infectiousness of STDs will not only have an impact on the incidence of complications, but will also be primary prevention to prevent the spread of HIV/AIDS. Studies in China indicated that inaccurate diagnoses were a problem for STD clinics where STDs are rapidly spreading.[2,3,23] Physicians play a key role in the diagnosis and treatment of STDs and are in dire need of continuing education and training, not only on STD diagnosis and treatment but also on strategies for counselling and educating their patients. Local health authorities need to monitor the quality of health service provided by STD clinics. Relevant regulations on STD management must be enforced to enhance and maintain the high quality of STD management services. In less developed regions of China, it is not economically feasible to maintain sophisticated laboratory facilities that can provide accurate testing for STD clinics at the primary level.

The strengths of this study include multiple clinic-based recruitments with mapping strategies using a common procedure in two disparate sites. Limitations could include the potential bias as a result of non-response, self-reporting and recall history. Misclassification bias for HIV and syphilis might not be a problem, since common methods were applied at the provincial laboratory. However, it might have occurred for other STDs; the methods and testing reagents used varied significantly in different STD clinics. Genital warts and chancroid were diagnosed based only on clinical examination. Although participants were recruited in multiple clinics selected by mapping strategy, the participants were only those who were visiting the clinics in the study sites during a specific period of time. Studies indicated that a substantial number of people with symptoms of an STD go directly to pharmacies, and these people may be at an increased risk of HIV infection and other STDs.[27,28]

After decades of exceedingly low STD rates in China, a full panoply of STD diagnoses is now evident, suggesting a generalized spread of the disease through commercial sex and bridging populations. Both for reproductive health concerns and for stemming the expansion of HIV, STD control and prevention must be revitalized as a priority for China's public health and medical institutions. Universal screening for HIV in STD clinics should be considered as a measure for control. Local STD clinics provide an excellent venue for delivering the targeted HIV/STD prevention and treatment. Effective training is a priority given the dearth of STD-experienced health-care workers.

Acknowledgments

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Table 1

Sociodemographic characteristics, awareness of HIV transmission routes and sexual behaviours among STD clinical attendees in Bengbu city, Anhui Province and Guiyang city, Guizhou Province, China

Factors	Bengbu, Anhui Province No.[*]	STDs (%)[†]	Guiyang, GuizhouProvince No.[*]	STDs (%)[†]
Sex				
Female	80 (29.2)	71.6	57 (22.0)	56.1
Male	196 (70.8)	77.6	202 (78.0)	59.9
Age (years)				
≥ 35	104 (39.1)	65.4	109 (47.8)	64.2
< 35	162 (60.9)	80.9	119 (52.2)	63.9
Marital status				
Married or cohabiting	220 (79.4)	72.7	200 (78.1)	59.5
Single or separated	57 (20.6)	87.7	56 (21.9)	58.9
Residency				
Local province	266 (96.0)	76.7	235 (92.5)	57.9
Other province	11 (4.0)	54.5	19 (7.5)	89.5
Ethnicity				
Han	260 (97.7)	75.0	207 (93.2)	62.8
Others	6 (2.3)	66.7	15 (6.8)	86.7
Education				
College or higher level	30 (10.8)	66.7	80 (22.0)	45.0
High school or lower level	247 (89.2)	76.9	248 (78.0)	68.9
Monthly income (yuan)				
≤ 1000	118 (82.5)	79.8	126 (56.3)	54.0
> 1000	25 (17.5)	76	98 (43.8)	75.5
Awareness of all three major transmission routes for HIV (sex, blood and mother to child)				
Yes	194 (72.9)	70.1	178 (79.5)	62.9
No	72 (27.1)	87.5	46 (20.5)	69.6
Willingness to use a condom				
No	92 (37.9)	63.0	37 (14.8)	62.2
Yes	151 (62.1)	82.8	213 (85.2)	57.3
Knew where to access HIV testing				
Yes	113 (42.8)	72.6	133 (54.3)	52.6
No	151 (57.2)	90.7	112 (45.7)	67.0
Ever had an HIV test				
Yes	11 (4.1)	63.6	20 (7.7)	75.0
No	258 (95.9)	75.6	239 (92.3)	57.7
Living with regular sex partner				
Yes	110 (40.9)	79.1	178 (68.7)	60.0
No	159 (59.1)	72.3	81 (31.3)	55.6

Factors	Bengbu, Anhui Province No.[*]	STDs (%)[†]	Guiyang, GuizhouProvince No.[*]	STDs (%)[†]
Condom use with regular partner in the last sexual encounter				
Yes	40 (40.4)	85.0	36 (20.7)	52.8
No	59 (59.6)	78.0	138 (79.3)	61.6
Condom use with regular sex partner in the last 3 months				
Always	10 (9.8)	60.0	11 (6.5)	72.7
Sometimes or never	92 (90.2)	83.7	159 (93.5)	59.1
Ever had casual sex encounter in the last three months[‡]				
No	224 (87.8)	72.3	153 (67.1)	56.9
Yes	31 (12.2)	90.3	75 (32.9)	78.7
No. of casual sex partners in the last three months				
1	14 (48.3)	92.8	44 (51.2)	65.9
≥ 2	15 (51.7)	93.3	42 (48.8)	85.7
Condom use with casual sex partner in the last sexual encounter				
Yes	9 (28.1)	88.9	12 (16.7)	58.3
No	23 (71.9)	82.6	60 (83.3)	61.7
Condom use with casual sex partner in the last three months				
Always	3 (9.4)	66.7	9 (11.7)	77.8
Sometimes or never	29 (90.6)	93.1	68 (88.3)	54.4

STD = sexually transmitted disease

[*] Total number of participants being diagnosed; some of the totals (No.) <277 in Bengbu city and <259 in Guiyang city indicated missing data

[†] Prevalence rate of STDs (including HIV)

[‡] Ever had casual sex encounter was defined as having had sex with someone other than a spouse or regular sex partner within the three months before the survey

Table 2

Prevalence of STDs among STD clinical attendees in Bengbu city, Anhui Province and Guiyang city, Guizhou Province, China

STDs	Bengbu, Anhui Province			Guiyang, Guizhou Province		
	No.*	STDs	%†	No.*	STDs	%†
Overall	277	210	75.8	259	153	59.1
HIV infection	277	0	0	259	1	0.4
Gonorrhoea	277	31	11.2	259	14	5.4
Chlamydia	277	21	7.6	259	13	5.0
NGU	277	76	27.4	259	43	16.6
Syphilis-RPR seropositive	277	17	6.1	259	45	17.4
Genital herpes (HSV-2)	277	11	4.0	259	20	7.7
Genital warts	277	54	19.5	259	17	6.6
Chancroid	277	0	0	259	0	0
Gonorrhoea and NGU	277	5	1.8	259	4	1.5
Syphilis and genital warts	277	3	1.1	259	0	0
NGU and genital warts	277	1	0.4	259	1	0.4
Gonorrhoea and genital warts	277	1	0.4	259	0	0
Genital herpes and genital warts	277	1	0.4	259	0	0

STD = sexually transmitted disease; NGU = non-gonococcal urethritis, tested positive for at least one of the following pathogens: *Ureaplasma urealyticum*, *Mycoplasma hominis* and *Mycoplasma genitalium*; RPR = rapid plasma reagin;

HSV-2 = herpes simplex virus-2

*
Number of participants being diagnosed

†
Prevalence rate of STDs

Table 3

Factors associated with acquisition STDs among STD clinical attendees in Bengbu city, Anhui Province and Guiyang city, Guizhou Province, China

Factors	Bengbu, Anhui Province		Guiyang, Guizhou Province	
	OR (95% CI)	AOR (95% CI)	OR (95% CI)	AOR (95% CI)
Sex				
Female	1.0		1.0	
Male	1.4 (0.8–2.5)		1.2 (0.6–2.1)	
Age (years)				
≥ 35	1.0		1.0	
< 35	2.2 (1.3–3.9)[**]	2.0 (1.3–3.9)[**]	1.0 (0.6–1.7)	
Marital status				
Married or cohabiting	1.0		1.0	
Single or separated	2.6 (1.2–6.2)[*]	4.9 (1.2–19.8)[*]	1.0 (0.5–1.8)	
Residency				
Local province	1.0		1.0	
Other province	0.4 (0.1–1.2)		6.2 (1.3–27.4)[**]	
Ethnicity				
Han	1.0		1.0	
Others	0.7 (0.1–3.7)		3.9 (0.8–17.5)	6.4 (1.3–32.4)[*]
Education				
College or higher level	1.0		1.0	
High school or lower level	1.7 (0.7–3.8)		2.7 (1.6–4.5)[***]	2.8 (1.4–5.5)[**]
Monthly income (yuan)				
≤ 1000	1.0		1.0	
> 1000	0.8 (0.3–2.1)		2.6 (1.5–4.7)[**]	3.1 (1.6–5.9)[**]
Awareness of all three major transmission routes for HIV (sex, blood and mother to child)				
Yes	1.0		1.0	
No	3.0 (1.4–6.4)[**]	3.2 (1.2–8.3)[*]	1.4 (0.7–2.7)	
Willingness to use a condom				
No	1.0		1.0	
Yes	2.8 (1.5–5.1)[**]	3.8 (1.9–7.8)[**]	0.8 (0.4–1.7)	
Knew where to access HIV testing				
Yes	1.0		1.0	
No	3.7 (1.9–7.4)[**]		1.8 (1.1–3.1)[*]	
Had an HIV test				
Yes	1.0		1.0	
No	1.7 (0.5–6.2)		0.5 (0.2–1.3)	
Living with regular sex partner				
No	1.0		1.0	
Yes	1.4 (0.8–2.6)		1.2 (0.7–2.1)	

Factors	Bengbu, Anhui Province		Guiyang, Guizhou Province	
	OR (95% CI)	AOR (95% CI)	OR (95% CI)	AOR (95% CI)
Condom use with regular partner in the last sexual encounter				
Yes	1.0		1.0	
Sometimes or never	0.6 (0.2–1.8)		1.4 (0.7–3.0)	
Condom use with regular sex partners in the last three months				
Always	1.0		1.0	
Sometimes or never	3.4 (0.9–13.6)		0.5 (0.1–2.1)	
Ever had casual sex encounter in the last three months[†]				
No	1.0		1.0	
Yes	3.6 (1.1–12.2)[*]		2.8 (1.5–5.3)[**]	2.3 (1.1–4.5)[*]
No. of casual sex partners in the last three months				
1	1.0		1.0	
≥ 2	1.1 (0.1–19.0)		3.1 (1.1–9.0)[*]	
Condom use with casual sex partner in the last sexual encounter				
Yes	1.0		1.0	
No	0.6 (0.1–6.2)		1.1 (0.3–4.1)	
Condom use with casual sex partner in the last three months				
Always	1.0		1.0	
Sometimes or never	6.8 (0.4–110.7)		0.3 (0.1–1.3)	

CI = confidence interval; OR = odds ratio; AOR = adjusted odds ratio

[†]Ever had casual sex encounter was defined as having had sex with someone other than a spouse or regular sex partner within the three months before the survey

[*]$P < 0.05$;

[**]$P < 0.01$;

[***]$P < 0.001$

Table 4

Factors associated with having casual sex among STD clinical attendees in Bengbu city, Anhui Province and Guiyang city, Guizhou Province, China

Factors	Bengbu, Anhui Province		Guiyang, Guizhou Province	
	OR (95% CI)	AOR (95% CI)	OR (95% CI)	AOR (95% CI)
Sex				
Female	1.0		1.0	
Male	1.2 (0.5–2.0)		1.3 (0.1–3.1)	
Age (years)				
< 35	1.0		1.0	
≥ 35	0.7 (0.4–1.2)		0.7 (0.4–1.2)	
Marital status				
Married or cohabiting	1.0		1.0	
Single or separated	1.4 (0.7–2.7)		3.1 (1.6–6.1)[**]	4.7 (2.1–10.4)[**]
Residency				
Local province	1.0		1.0	
Other province	2.7 (1.0–6.9)[*]	4.4 (1.0–22.6)[*]	3.5 (1.4–9.1)[**]	3.4 (1.0–11.4)[*]
Ethnicity				
Han	1.0		1.0	
Others	0.7 (0.1–5.9)		1.3 (0.5–3.5)	
Education				
College or higher level	1.0		1.0	
High school or lower level	0.6 (0.3–1.3)		1.0 (0.6–1.7)	
Monthly income (yuan)				
≤ 1000	1.0		1.0	
> 1000	2.5 (1.3–5.0)[*]	5.0 (1.9–10.1)[**]	2.3 (1.4–3.3)[***]	3.1 (1.7–5.1)[**]
Awareness of all three major transmission routes for HIV (sex, blood and mother to child)				
Yes	1.0		1.0	
No	2.1 (1.1–3.7)[*]	4.6 (1.7–12.4)[**]	1.7 (1.1–3.0)	3.4 (1.6–7.2)[**]
Willingness to use a condom				
No	1.0		1.0	
Yes	3.3 (1.2–9.8)[**]		1.6 (0.8–3.2)	
Unknown				
Knew where to access HIV testing				
No	1.0		1.0	
Yes	2.3 (1.1–5.0)[**]		3.3 (2.0–9.9)[**]	
Had an HIV test				
No	1.0		1.0	
Yes	2.5 (0.9–9.6)	5.0 (1.3–33.0)[*]	1.4 (0.5–3.9)	
Living with regular sex partners				
Yes	1.0		1.0	

Factors	Bengbu, Anhui Province		Guiyang, Guizhou Province	
	OR (95% CI)	AOR (95% CI)	OR (95% CI)	AOR (95% CI)
No	2.5 (1.3–5.0)[**]	2.3 (1.1–5.0)[*]	2.6 (1.6–4.4)[**]	
Condom use with regular partner in the last sexual encounter				
Yes	1.0		1.0	
No	1.3 (0.6–3.0)		2.0 (0.8–5.0)	
Condom use with regular sex partner in the last three months				
Always	1.0		1.0	
Sometimes or never	2.0 (0.3–2.1)		1.1 (0.2–6.4)	
STDs diagnosed				
No	1.0		1.0	
Yes	3.6 (1.1–12.2)[**]	2.3 (1.5–10.3)[*]	2.8 (1.5–5.3)[**]	1.8 (1.2–6.3)[*]

CI = confidence interval; OR = odds ratio; AOR = adjusted odds ratio

[*] $P < 0.05$;

[**] $P < 0.01$;

[***] $P < 0.001$