

Preplanned Studies

High Risk Behaviors for HIV and STIs Among Men Who Have Sex with Men Aged 15–19 Years — Guangzhou City and Tianjin Municipality, China, 2018

Hui Liu¹; G. Johnston Lisa²; Lei Zhang³; Mengjie Han^{1*}; Hao Zhu⁴; Jie Yang⁵;
Jingyan Li⁶; Lu Liu¹; Yujing Liu¹; Mark Prabhu Shirley⁷

Summary

What is already known on this topic?

There has been a steady increase of new reported HIV infections in individuals aged 15–24 years, primarily from self-reported men who have sex with men (MSM).

What is added by this report?

MSM aged 15–19 years practiced behaviors that put them at high risk for HIV and other sexually transmitted infections (STIs). Systems to address their unique risks and vulnerabilities in both school settings and in high impact HIV interventions may be inadequate.

What are the implications for public health practice?

Special needs of MSM aged 15–19 years must be met by starting sex education in junior high school and sensitizing health workers in and out of school settings on quality counselling, testing, and referral. Piloting approaches that address age of consent issues are also suggested.

Adolescents and young people represent a growing share of people living with human immunodeficiency virus (HIV) globally (1). In China, new reported HIV cases among Chinese youth aged 15–24 years reached 16,307 in 2017 (2). The 2016 sentinel surveillance indicated that 82% of newly reported HIV cases among students were among males who reported having sex with males (MSM) (3). Of new HIV cases diagnosed in China, the male to male sexual transmission rate increased from 3.4% in 2007 to 28.2% in 2015, and remained at around 28.2% from 2017 to 2018. (4). Also, China has 146 million adolescents, the second largest adolescent population in the world (5), but the population of adolescent MSM (AMSM) in China has not been well-studied. In 2018, an online survey was conducted in Guangzhou City

and Tianjin Municipality to measure risk factors and behaviors for HIV and STIs to better plan prevention programs and service.

Eligible participants were male, aged 15–19 years, reported having oral or anal sex with a male in the past 12 months, and were living or working in Guangzhou or Tianjin. Online sampling used standard respondent driven sampling (RDS) method (6), which are a chain referral method used to sample members of hidden and hard-to-reach populations starting by choosing ‘seed’ participants who have large social networks and are well-known within their communities (7). Once the seed participants complete the survey, they are asked to recruit a set number of their eligible peers (usually up to three) using a uniquely coded coupon. Ongoing successive recruitment of peers results in multiple recruitment waves with the intended goal of eliminating common chain referral biases by the time the calculated sample size is reached. A payment system is used to remunerate participants for completing the survey (primary) and for successfully recruiting eligible participants (secondary).

Due to the hidden nature and vulnerability of AMSM and the popularity of online social networks among this age group in China, this study used a web-based peer-to-peer probability-based sampling technique using WeChat, a Chinese multi-purpose messaging, social media, and mobile payment app. The surveys were conducted in Tianjin (2015 population: 14,722,100) and Guangzhou (2015 population: 12,926,800), both of which have a strong presence of community-based organizations (CBOs) and adolescent networks and are also program sites for the China Comprehensive AIDS Response (China CARES) and UNICEF’s adolescent HIV prevention collaboration with the Chinese government. Formative research and training were conducted with managers from CBOs and adolescent representatives from Guangzhou and Tianjin to identify potential sampling

issues related to RDS, to resolve study logistics, to determine AMSM web-use behaviors for rolling out the surveys online, and to design the questionnaire.

A WeChat-based online program accessible via quick response (QR) code was developed and rolled out by CBOs in the two cities. Respondents who received a valid recruitment e-coupon could scan their unique QR code and respond to a set of eligibility questions. Eligible persons were then requested to read the purpose of the survey and provide informed consent, and complete the online questionnaire. Those who completed the entire questionnaire received an 8-digit password for an online payment of 30 CNY (~4.24 USD) via Alipay, administered by the survey software manager. After completing the questionnaire, the respondent received up to 5 coupons with unique QR codes which were used to recruit eligible peers into the survey. Respondents received an additional incentive of 30 CNY for each person they recruited who enrolled and completed the survey. These incentives were also provided online via Alipay and administered by the software manager.

No personal identifying information was collected, no response could be traced back to respondents, and, to avoid duplicates, each IP address could only enroll once. The questionnaire collected data on sociodemographic characteristics, social network sizes, use of MSM social networks, sexual and drug risk, knowledge on HIV and testing services, sexual experiences, perceptions, experience with buying and selling sex, condom use, social support, and access to

and utilization of HIV related services.

Data were directly entered into a database as participants responded to the online questionnaire. Data were monitored by an information technology manager as well as the survey coordinator and an international consultant. Data were formatted and coded in Microsoft Excel (version 14.0; Microsoft Corporation) and SPSS (version 23.0; IBM Corporation) before being downloaded into RDS-Analyst (www.hpmrg.org), a specialized software for analysing RDS data. Data were assessed for bottlenecks and convergence and population proportions, and 95% confidence intervals (CI) were derived with RDS-analyst using the Gile successive sampling estimator (8–9) adjusted for differential recruitment and social network sizes. Given that the online survey format resulted in some unreliable social network size responses, social network sizes were imputed with the visibility imputation function in RDS Analyst (10). This survey received ethical approval from the ethics review committee of the National Centre for AIDS/STD Control and Prevention of China CDC.

The survey in Guangzhou recruited 288 MSM aged 15–19 years resulting in 3 recruitment chains with a maximum of 13 waves. In Tianjin, 258 were recruited resulting in 5 recruitment chains and a maximum of 9 waves (Figure 1A and Figure 1B, highlighted by age groups). The mean age of MSM aged 15–19 years was 17 years old in Guangzhou and 18 years old in Tianjin. Homosexual identity was reported by 32% of MSM aged 15–19 years in Guangzhou and 69% in Tianjin. Most respondents reported that their parents

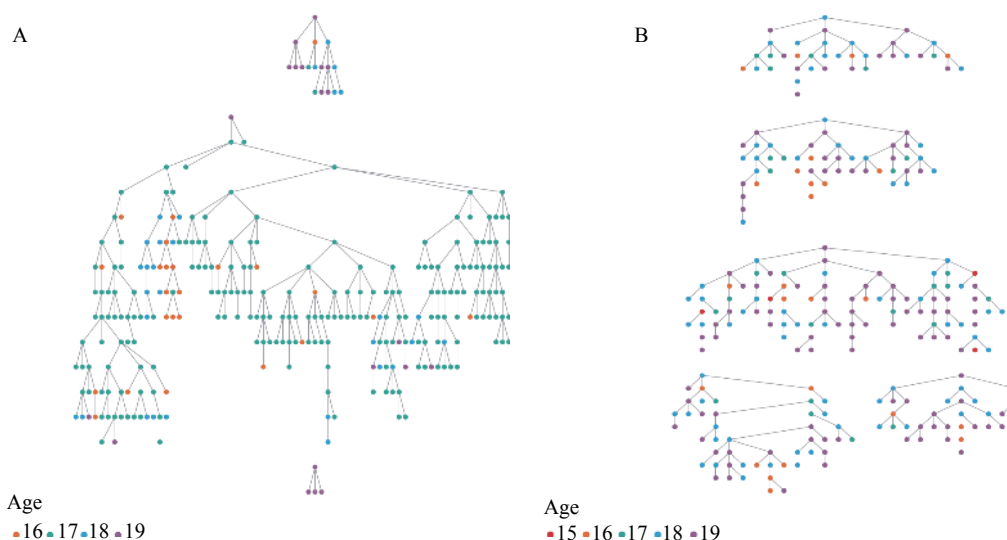


FIGURE 1. Recruitment chains of adolescent men who have sex with men (AMSM) sampling in Guangzhou, April–May, 2018 (n=288) (A) and in Tianjin, April–September, 2018 (n=258) (B).

did not know about their sexual attraction to males, and 75% of MSM aged 15–19 years in Guangzhou and more than 94% in Tianjin reported using any MSM online social network app (Table 1).

The age group with the highest percentage for first anal sexual experience was 16 years old in Guangzhou and 18 years old in Tianjin. Most MSM aged 15–19 years in the 2 cities reported having had an anal sexual experience in the past 6 months, with over half having multiple sex partners. One third of respondents in both cities who reported having anal sex were primarily receptive partners. Forty-two percent of AMSM in Guangzhou and 9% of AMSM in Tianjin reported

experience of selling sex. Among them 56% and 54% reported having consistent condom use respectively. Among MSM aged 15–19 years who ever used a condom, the age at first condom use during an anal sexual experience most frequently reported was 16 years in Guangzhou and 18 years in Tianjin. An estimated 61% of AMSM in Guangzhou and 43 % in Tianjin reported using any drug before anal sex with a male. Although as much as 65% of MSM aged 15–19 years in Guangzhou and 93% in Tianjin knew that the proper use of condoms during each sexual intercourse reduces the risk of HIV transmission, only 26% of MSM aged 15–19 years in Guangzhou and 12% in

TABLE 1. Sociodemographic characteristics and communication factors of adolescent men who have sex with men (AMSM) in Guangzhou City and Tianjin Municipality, 2018.

Item	Guangzhou (n=288)		Tianjin (n=258)	
	N	Percentage (CI)	N	Percentage (CI)
Currently in school				
Yes	270	94.7 (91.9–97.5)	228	83.1 (79.9–94.3)
No	18	5.3 (2.5–8.1)	30	12.9 (5.7–20.1)
Education level				
≤Junior high school	58	19.1 (13.8–24.4)	18	8.0 (2.2–13.9)
Senior high/vocational/second	202	71.2 (65.2–77.2)	105	46.0 (35.8–56.2)
≥Vocational college	28	9.6 (5.4–14)	135	46.0 (35.5–56.5)
Sexual orientation				
Gay/homosexual	96	32.1 (25.2–38.9)	173	68.7 (59.2–78.2)
Bisexual	59	24.1 (16.8–31.3)	45	18.0 (10.1–25.8)
Straight	51	17.2 (11.5–23)	2	2.9 (0–6.6)
Unsure	43	17.2 (11.7–22.8)	18	7.2 (2.1–12.4)
Other	5	1.8 (0–3.9)	2	0.3 (0–0.7)
Do not know	16	7.5 (2.5–12.6)	3	2.9 (0–6.7)
Talked about same sex behaviour among circle of friends				
Yes	143	55.2 (48.2–62.4)	129	57.7 (46.4–68.9)
No	121	44.8 (37.6–51.8)	110	42.3 (31.1–53.6)
Parents know about sexual attraction to males				
Yes	101	39.8 (31.4–48.2)	30	11.2 (3.8–18.4)
No	163	60.2 (51.8–68.6)	210	88.8 (81.6–96.2)
How MSM network was entered				
Acquaintances outside school	83	28.7 (21.5–25.9)	14	7.3 (3.2–11.5)
Classmates	72	25.2 (18.5–32)	34	12.4 (6.9–17.8)
From internet	75	28.6 (20.3–36.9)	174	64.2 (55.9–72.5)
Other	3	1.9 (0–4.2)	5	2.6 (0–5.7)
Can't remember	45	15.6 (9.6–21.5)	29	13.5 (7.7–19.2)
Uses any MSM online social network app				
Yes	215	74.7 (67.5–81.9)	252	94.3 (88.8–99.9)
No	73	25.3 (18.2–32.5)	6	5.7 (0.1–11.2)

Tianjin knew that a healthy-looking person can have HIV, and only 27% of AMSM in Guangzhou and 25% in Tianjin knew that having sex with one faithful, uninfected partner, reduces the risk of HIV transmission. Percentages of MSM aged 15–19 years in Tianjin who were aware of anti-retroviral therapy and self-testing for HIV were 91.6% and 85.6%,

respectively, whereas in Guangzhou the awareness rates of anti-retroviral therapy and HIV self testing were 59.5% and 45.8%, respectively. The percentages of MSM aged 15–19 years reporting ever having a HIV test were 46.9% in Guangzhou and 79.4% in Tianjin. Self-reported positive results of HIV was 17.6% in Guangzhou and 2.1% in Tianjin (Table 2).

TABLE 2. HIV-related knowledge/awareness and behaviours among adolescent men who have sex with men (AMSM) in Guangzhou City and Tianjin Municipality, 2018.

Item	Guangzhou (n=288)		Tianjin (n=258)	
	N	Percentage (CI)	N	Percentage (CI)
Age at first anal sexual experience				
≤12 years	18	6.1 (3.1–9.1)	4	3.0 (0–7.2)
13 years	10	2.6 (0.6–4.8)	8	1.4 (0–3.0)
14 years	25	9.9 (5.7–14.1)	7	3.9 (0.5–7.3)
15 years	44	16.5 (10.9–22.1)	30	7.3 (2.5–19.5)
16 years	63	22.1 (16–28.1)	39	12.6 (5.7–17.8)
17 years	49	21.2 (14.9–27.5)	40	11.4 (5.0–17.8)
18 years	28	10.1 (5.8–14.3)	62	30.2 (20.1–40.4)
19 years	6	2 (0.3–3.6)	29	11.0 (4.5–18.7)
Do not remember	25	9.6 (5.5–13.6)	25	18.5 (9.9–27.2)
Age at first use of condom during anal sexual experience				
≤12 years	10	3.5 (0.4–6.6)	2	2.3 (0–7.8)
13 years	8	3.0 (0–6.3)	4	1.2 (0–3.5)
14 years	16	9.1 (3.0–15.2)	7	3.1 (0.2–6.1)
15 years	39	20.4 (10.2–30.5)	17	4.6 (1.4–7.8)
16 years	68	28.5 (20.0–37.0)	32	16.0 (8.8–23.1)
17 years	53	19.4 (11.6–27.1)	38	12.8 (7.8–17.8)
18 years	33	12.6 (5.5–19.7)	57	31.6 (23.7–39.6)
19 years	12	3.5 (0–7.0)	53	28.3 (20.4–36.2)
Anal sexual experience in the past 6 months				
Yes	211	78.6 (73.1–84)	233	91.0 (84.4–97.5)
No	59	21.4 (16.0–26.8)	11	9.0 (2.5–15.6)
Number of anal sex partners (among those who had anal sex in past 6 months)				
1	102	48.2 (39.5–56.9)	87	42.8 (30.2–55.3)
2–5	58	25.7 (18.3–33.1)	98	42.4 (31.8–53.1)
6–10	23	11 (5.6–16.4)	37	9.4 (3.4–15.4)
11–20	24	12.8 (7.2–18.3)	7	1.5 (0–3.3)
21 and above	4	2.3 (1.4–3.3)	4	4.0 (0–8.8)
Age range of sex partners* in past 6 months				
Under 20 years	185	68.6 (61.5–75.8)	110	45.5 (35.4–55.6)
20–30 years	53	18.3 (12.3–24.2)	113	47.6 (37.0–58.0)
31–40 years	26	10.1 (6.2–14.1)	9	6.9 (0.9–12.9)
41 years or above	6	2.9 (0.6–5.3)	1	0.1 (0–0.2)

TABLE 2. (Continued)

Item	Guangzhou (n=288)		Tianjin (n=258)	
	N	Percentage (CI)	N	Percentage (CI)
Usual role in anal sex experience in past 6 months				
Insertive	93	40.6 (30.2–50.9)	77	37.4 (26.6–48.4)
Receptive	70	33.8 (23.1–44.5)	97	38.0 (27.3–48.7)
Insertive and receptive	46	25.6 (17.0–34.2)	54	24.6 (15.2–33.9)
Ever paid someone money for sex				
Yes	117	44.6 (37.0–52.4)	13	5.3 (0.2–10.5)
No	148	55.4 (47.7–63)	228	94.7 (89.5–99.8)
Frequency of using a condom when paying for sex				
Every time	74	57.9 (47.0–69.0)	2	29.2 (0–76.2)
Sometimes	37	36.5 (25.5–47.4)	7	38.8 (0–76.0)
Never	6	5.6 (5.6–5.6)	4	32.0 (0–73.4)
Ever received money or other benefit in return for sex				
Yes	112	41.7 (33.2–50.1)	21	9.4 (2.4–16.4)
No	153	58.4 (49.9–66.8)	220	90.6 (83.6–97.6)
Frequency of using a condom when selling sex				
Every time	65	55.5 (39.3–71.7)	10	53.6 (25.8–81.6)
Sometimes	40	39 (27.6–50.5)	10	45.1 (17.2–72.8)
Never	7	5.5 (0–14.2)	1	1.3 (0.4–2.2)
Ever been forced or coerced to have anal sexual experience with a male				
Yes	116	43.7 (35.0–52.2)	19	8.8 (3.8–13.8)
No	148	56.4 (47.7–65.0)	222	91.2 (86.2–96.2)
Frequency of condom use when forced to have anal sexual experience				
Every time	66	58.3 (44.5–72.1)	9	53.5 (26.6–80.5)
Sometimes	42	36.5 (23.7–49.4)	3	18.3 (3.8–40.4)
Never	8	5.2 (1.2–9.0)	7	28.2 (14.2–42.2)
Can always negotiate with a partner to use condoms when wanting to				
Yes	185	74.9 (67.8–82.1)	212	88.7 (83.3–94.1)
No	46	21.4 (15.3–27.5)	17	9.0 (3.8–14.2)
Never want to use	9	3.7 (0.2–7.2)	6	2.3 (0–4.7)
Used a condom during last anal sexual experience				
Yes	206	85.3 (78.4–92.2)	143	62.7 (51.1–74.3)
No	34	14.7 (7.8–21.6)	93	37.3 (25.7–48.9)
Used any drug before anal sex with a man to enhance sexual experience				
Yes	160	61.4 (53.6–69.3)	107	42.5 (32.9–52.3)
No	105	38.6 (30.7–46.4)	135	57.5 (47.4–67.2)
Awareness that a healthy-looking person can have HIV				
Yes	75	25.7 (19.0–32.4)	33	12.2 (5.3–19.2)
No	130	50.4 (42.7–58.2)	184	73.7 (64.6–82.7)
Do not know	65	23.9 (19.0–30.8)	27	14.1 (6.9–21.4)

TABLE 2. (Continued)

Item	Guangzhou (n=288)		Tianjin (n=258)	
	N	Percentage (CI)	N	Percentage (CI)
Awareness that having sex with one faithful-uninfected partner reduces the risk of HIV transmission				
Yes	94	26.6 (26.7–39.2)	45	25.3 (15.8–34.7)
No	101	37.8 (30.3–45.3)	178	65.3 (55.0–75.7)
Do not know	75	29.3 (21.7–36.9)	21	9.4 (3.3–15.4)
Awareness that proper use of condoms during each sexual experience reduces the risk of HIV transmission				
Yes	180	65.3 (57.8–72.7)	231	93.4 (88.1–98.6)
No	51	20.9 (15.5–26.2)	8	3.4 (0–7.0)
Do not know	39	13.9 (7.4–20.3)	5	3.2 (0–6.9)
Aware of anti-retroviral therapy				
Yes	167	59.5 (51.3–67.6)	216	91.6 (86.3–96.8)
No	103	40.5 (32.4–48.7)	28	8.5 (3.2–13.7)
Aware of a test to take by oneself to test for HIV				
Yes	128	45.8 (37.1–54.5)	201	85.6 (78.5–92.6)
No	142	54.2 (45.5–62.9)	43	14.4 (7.4–21.5)
Ever tested for HIV				
Yes	123	46.9 (37.4–56.2)	198	79.4 (70.5–88.3)
No	141	53.2 (43.8–62.6)	47	20.7 (11.7–29.5)
Result of last test (among those who ever had an HIV test)				
Negative	78	59.7 (45.7–73.6)	183	84.1 (76.8–91.3)
Positive	22	17.6 (9.8–25.3)	4	2.1 (0–5.5)
Do not know results	23	22.8 (11.6–33.9)	11	8.3 (0.3–16.4)
Self-perceived level of HIV infection risk				
No risk	51	18.8 (13.4–24.1)	43	18.6 (9.4–27.9)
Some risk	116	47.9 (41.3–54.6)	91	36.3 (26.3–46.2)
High risk	63	25.2 (18.5–31.9)	75	30.9 (19.9–41.9)
Do not know	0	–	17	8.3 (1.9–14.7)

* Type of sex is not defined; sex of partner not defined; question asks about multiple partners whose ages may not be in the same range.

DISCUSSION

This survey found that AMSM have many intersecting risks including high percentage of inconsistent condom use during anal sex, of early sexual initiation, of recreational drug use, and use of sexual enhancement drugs that are likely leading to unprotected sex or sex with multiple partners. They also have high rates of self-reported HIV infection.

These findings strongly indicated that education on STI/HIV prevention and on risks of drug use must begin at younger ages. Educators in school settings must be trained on and sensitized to the specific needs for knowledge of and services for AMSM and other key

adolescent populations to provide early and targeted interventions in response to the high prevalence of risky sex and substance abuse. Both AMSM and service providers should be informed about the actual age of consent of 16 years for independent testing, to encourage more adolescents at high risk of HIV to get tested and receive counselling. In addition, utilization of self-testing should be explored for AMSM.

Because AMSM have large social networks and rely on peers for information, more activities should be explored on how to use the highly active social networks and peer communications to improve AMSM's knowledge and access to services. Creative technology-based interventions should be enhanced to

leverage social media to expand and improve connections with MSM, to better understand their behaviors, to more effectively disseminate knowledge on HIV prevention, counselling, and testing, and to improve access to services.

This survey had some limitations. Although recruitment through peers using WeChat was effective, the reporting of accurate network sizes could not be verified. Some variables had small values, which resulted in wide confidence intervals that limited the ability to derive accurate estimates. However, this is the first use of online RDS among MSM in China and provides essential information about their behaviors and needs. Additional surveys using online techniques should be conducted in other cities to gain a more expanded epidemiological picture of MSM in China.

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* Corresponding author: Mengjie Han, mjhan@chinaaids.cn.

¹ National Centre for AIDS/STD Control and Prevention, Chinese Center for Disease Control and Prevention, Beijing, China;

² University of California, San Francisco, Global Health Sciences, San

Francisco, USA; ³ UNICEF China, Beijing, China; ⁴ United States CDC, China Office, Beijing, China; ⁵ Tianjin Shenlan Public Health Counseling Service Centre, Tianjing, China; ⁶ Lingnan Partners, Guangzhou, China; ⁷ UNICEF East Asia and Pacific Regional Office, Bangkok, Thailand.

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