

## **Time associated evolvement of networking pattern and its association with STD/HIV transmission risk in HIV-positive MSM in Hong Kong *October 2018 to March 2021***

### **BACKGROUND**

1. Globally, men who have sex with men (MSM) constitute a key population at higher risk of HIV infection. In Hong Kong, a high proportion of diagnosed HIV-positive MSM had their viral load suppressed. Inconsistent condom use among some of the HIV positive MSM could however predispose to the spread of sexually transmitted diseases (STD) other than HIV. This phenomenon is clearly evidenced by the recent raised activity or outbreaks of STD, such as syphilis, hepatitis A and hepatitis C, among HIV-positive MSM in Hong Kong and other parts of the world including Asia.
2. An understanding of the networking patterns among MSM may shed light on the community's exposure risk to HIV/STD. In 2014, our Team evaluated the changes in networking pattern of an MSM cohort shortly (say, one year) after HIV diagnosis and antiretroviral therapy (ART). While we reported moderate changes, the situation might not remain static thereafter. Notably "mobile apps literacy" has increased tremendously in the following years. The landscape of high risk behaviours, such as chemsex, anilingus and group sex, has also been evolving. Mindful of the continued network changes temporally after HIV diagnosis, a follow-up study on this cohort is timely to provide assess the future risk of STD/HIV spread among MSM in Hong Kong.
3. A cross-sectional study was conceptualised which included the self-administration of a questionnaire on a cohort of previously interviewed HIV-positive MSM, with the aim of enhancing the understanding of transmission potential of STD and HIV through male-to-male sex in Hong Kong. The specific objectives are, to:
  - (a) Compare the current sex-networking and partnership patterns of HIV-positive MSM with that 4 years ago;
  - (b) Describe the prevalence of unprotected sex and other risk behaviours;
  - (c) Assess the inter-relationship between sex-networking patterns and behavioural practice.

### **PROJECT ADMINISTRATION AND PROGRESS**

4. A Project Team was set up comprising the Principal Investigator (Steven Poon, subsequently changed to SS Lee), and Co-Investigators including a Research Assistant Professor (Candy Wong), a postdoctoral Fellow (Donald Kwan) and PhD student (Tony Chan), based at Stanley Ho Centre for Emerging Infectious Diseases, The Chinese University of Hong Kong. The Project began with the development of the questionnaire, and amendment to ethical approval granted by Joint CUHK-NTEC Clinical Research Ethics Committee (CRE2013.453), and coordination with participating HIV specialist clinic.

5. The questionnaire was constructed in both English and Chinese, and available in paper format. A total 345 HIV+ MSM who had participated in a previous study in 2014 were approached by clinic staff when each person returned to the clinic for followup in 2019. They were each given a package which included the questionnaire (4 pages) and a reply slip (for including address so that a HKD25 meal coupons could be posted as an incentive). A special drop-box was placed in the clinic area to collect the returns.

6. The project was rolled out in April 2019. The uptake was slow because of the long intervals between clinical followups which meant that it could take 6 months (instead of 3 months in the initial plan) before a patient revisited the clinic. A majority of the targeted MSM (n=337, 97.7%) were successfully approached to receive the invitation.

## MAIN RESULTS OF THE STUDY

7. A total of 205 (60.8%) finally joined the study. After excluding 3 incomplete entries, networking data of 202 MSM with reference to 2014 and 2019 were available for analyses. The median age at HIV diagnosis was 33. The diagnoses were made in 2013-2014 (43.4%), 2011-2012 (15.6%), 2006-2010 (29.8%), 2005 or before (18.1%). About two-thirds (67.8%) have attained tertiary education level, and some 78% were in full-time employment. ART had been initiated for all except 18 (8.8%) at the time of the 2014 survey.

8. The main sex-networking venues (Box 1) frequented by over one-quarter of the respondents in 2014 were: saunas (48%), bars (26.7%), and gymnasiums (25.2%). By 2019, only saunas continued to be the main networking venue type frequented by one-third of the HIV-positive MSM. Mobile phone Apps was used by over half of all respondents at either timepoints, while other online platforms had become less commonly used in 2019 compared to 2014 (25.2% vs 40.1%, p<0.001).

	2014, n (%)	2019, n (%)	p
<b>Sex networking venue (n = 202)</b>			
Public toilet	16 (7.9)	23 (11.4)	0.146
Bar	54 (26.7)	36 (17.8)	<b>0.006</b>
Sauna	97 (48.0)	74 (36.6)	<b>0.007</b>
Swimming pool/Beach	47 (23.3)	31 (15.3)	<b>0.024</b>
Gymnasium	51 (25.2)	27 (13.4)	<b>&lt;0.001</b>
Party	27 (13.4)	23 (11.4)	0.584
Mobile phone application	114 (56.4)	125 (61.9)	0.161
Social networking site/chatroom/forum	81 (40.1)	51 (25.2)	<b>&lt;0.001</b>
Non-local bar	39 (19.3)	33 (16.3)	0.405
Non-local sauna	40 (19.8)	41 (20.3)	1.000
Non-local party	19 (9.4)	15 (7.4)	0.540

9. Sexual behaviours of participating MSM had changed overtime (Box 2). Unprotected anal sex was reported by 36.6% in 2019 compared to 27.8% in 2014, while chemsex was also more commonly practised in the recent year.

**Box 2. Comparison of sex partnership and risk behaviours in HIV-positive MSM between the 2014 and 2019 survey**

	2014, n (%)	2019, n (%)	p
<b>Type of sex partners (n = 205)</b>			
Regular sex partners (RSPs)	129 (62.9)	130 (63.4)	1.000
Average no. of RSP in a year	1.82	1.94	0.495
Non-regular sex partners (NRSPs)	106 (51.7)	101 (49.3)	0.635
Average no. of NRSP in a month	2.38	2.62	0.804
Commercial sex partners (CRPs)	16 (7.8)	12 (5.9)	0.453
Average no. of CSP in a month	1.33	1.07	0.092
<b>Serosorting (n = 201)</b>			
No preference on HIV status of sex partners	134 (65.3)	125 (62.2)	
Prefer HIV-negative sex partners	20 (9.8)	20 (10.0)	0.075
Prefer HIV-positive sex partners	29 (14.1)	23 (11.4)	
No longer having sex	22 (10.7)	33 (16.4)	
<b>Risk behaviours</b>			
Unprotected anal sex (n = 205)	57 (27.8)	75 (36.6)	<b>0.028</b>
Concurrent sex partnership (n = 201)	59 (29.3)	64 (31.8)	0.614
Alcohol-drinking before sex (n = 202)	46 (22.8)	46 (22.8)	1.00
Chemsex (n = 193)	40 (20.7)	75 (38.9)	<b>&lt;0.001</b>
Bisexuality (n = 202)	3 (1.5)	5 (2.5)	0.617
<b>History of sexually transmitted diseases (n = 201)</b>			
Yes	47 (23.4)	63 (31.3)	0.07
No	154 (76.6)	138 (68.7)	

## ACCOMPLISHMENTS & CONSTRAINTS

10. The research project has so far led to the publication of one manuscript, and the presentation of a poster abstract at an international conference (another research manuscript under preparation):

- Poon CM, Wong NS, Kwan TH, Wong HTH, Chan KCW, Lee SS. Changes of sexual risk behaviors and sexual connections among HIV-positive men who have sex with men along their HIV care continuum. *PLoS One* 2018;13(12):e0209008. <https://doi.org/10.1371/journal.pone.0209008>
- Chan CP, Poon CM, Wong NS, Kwan TH, Lee SS. Changing patterns of sex networking and sexually transmitted infection in HIV-positive men who have sex with men following HIV diagnosis. [P\_105] *Asia-Pacific AIDS & Co-Infections Conference 2020* Virtual 15-17 October 2020, Bangkok, THAILAND.

11. The main constraint was the problem of recruiting participants during the COVID-19 outbreaks. The project period has been extended to enable more eligible MSM to be enrolled in completing the survey.

## CONCLUSIONS

12. The sexual behavioural practice of MSM is a dynamic process which has a tendency of changing with time and is impacted by HIV diagnosis. The sexual health needs of MSM requires focused attention both before and after HIV diagnosis.