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1 **Coercion and HIV Self-Testing in Men Who Have Sex with Men: Implementation Data**
2 **from a Cross-Sectional Survey in China**

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31 **Running head:** HIV test coercion in Chinese MSM

32

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48 **INTRODUCTION**

49 HIV self-testing (HIVST) scale up may help achieve the first 90 within the UNAIDS 90-90-
50 90 targets.¹ HIVST is defined as a process in which a person collects his/her own specimen
51 (oral fluid or blood) and then performs a test and interprets the result, often in a private
52 setting, either alone or with someone he or she trusts.² New World Health Organization
53 (WHO) guidelines supporting HIVST have provided momentum for self-testing.²

54
55 Although HIVST increases agency about when, where, and with whom to test,^{3,4} one
56 unintended consequence may be an increase in coercive HIV testing. We define coercion as
57 being *forced* to test. This may be through physical means (with actual violence or threat of
58 violence) or could involve threats to take away something if the person does not do the test
59 (e.g. losing their job, breaking up a relationship, not having sex). The WHO and others state
60 that HIV testing must be voluntary.^{2,5} However, cases of coerced testing have been observed
61 among women forced by their employers (both in sex work and non-sex work settings),^{3,6}
62 detained individuals (prisoners, drug users, sex workers) forced by institutions,^{7,8} and young
63 people forced by their sex partners.³ In China, there is an emphasis on public health responses
64 focused on expanding key population HIV testing and a history of compulsory HIV testing
65 among several subpopulations.⁹ For example, in 1995, a Chinese law required premarital HIV
66 testing,¹⁰ and sex workers and drug users often receive compulsory testing in detention
67 settings.^{7,9,11}

68
69 In recent years, China has rapidly scaled up HIVST, partly driven by a thriving online self-
70 test kit market¹². Surveys of men who have sex with men (MSM) report that approximately a
71 third have already used HIV self-testing¹³. In a setting where HIV testing has become more
72 decentralized, it is unknown if coercion may be occurring. We aimed to examine the
73 prevalence and correlates of coerced HIV testing amongst MSM in China.

74
75 **METHODS**

76 From July to August 2016, an online, cross-sectional study among Chinese MSM was
77 conducted. At the time of recruitment, these men were living in one of eight cities in
78 Guangdong Province (Guangzhou, Jiangmen, Zhuhai, Shenzhen) or Shandong Province
79 (Yantai, Jinan, Qingdao, Jining). Advertisements were distributed through Blued (Blue
80 Brother, Beijing, China), a social networking mobile phone application for MSM, used by

81 approximately 40 million users. Inclusion criteria were men born biologically male, aged \geq
82 16 years, who had ever had sex with another man, and had ever tested for HIV.

83

84 Demographic variables included their age, education level, marital status, annual income and
85 household residency status. Sexual history included their sexual orientation, disclosure of
86 sexuality or sexual history with men other than regular partner, disclosure of sexuality or
87 sexual history to health providers, where they usually met their sexual partners, consistency
88 of condom use for anal sex in the preceding three months, any casual male partner(s) in the
89 preceding three months. The level of community engagement in sexual health was defined
90 through six questions.¹⁴

91

92 HIV testing behaviours included whether past testing was through facility and/or HIVST kits,
93 whether the HIVST kit was provided by someone else, and whether other people were
94 present during their last HIVST. Men who experienced HIV test coercion were identified
95 from the questions: “Did someone else (partner, boss, friend, or others) force you to take an
96 HIV test (facility based test?)” and “Did someone else (partner, boss, friend, or other) force
97 you to take an HIV self-test?”.

98

99 Descriptive analysis was conducted to summarize the demographic, behavioural, and HIV
100 testing experience. χ -squared tests were used to test for statistically significant differences
101 ($p < 0.05$) in reporting of HIV test coercion between men who reported using HIVST and
102 those who have not used HIVST. Bivariable and multivariable logistic regression were
103 conducted to explore factors associated with reported HIV test coercion. Each multivariable
104 model was built using results from a literature search and expert consensus from
105 collaborators to select potential confounders. Model adjustment controlled for confounding
106 by variables identified through directed acyclic graphs.¹⁵ Each variable was examined
107 independently in separate regression models, adjusted for age, education, annual income and
108 household registration status. All analyses were conducted using STATA software
109 (StataCorp, College Station, TX, USA).

110

111 Ethical approval was obtained from the ethics review committees at the Guangdong
112 Provincial Centre for Skin Diseases and STI Control, the University of North Carolina at
113 Chapel Hill, and the University of California, San Francisco.

114

115 **RESULTS**

116 One thousand three hundred and twelve MSM reported having ever tested for HIV.
117 Respondents were young (mean age 26.9 ± 6.3), and about two-thirds (69%) had an above
118 high school level education. The majority (76%) self-identified as gay and a third (31%)
119 reported condomless anal sex in the last 3 months.

120

121 The majority had ever tested in a facility (86%, $n=1,125$). About half had ever self-tested
122 (52%, $n=685$), and about a third had used both facility-based testing and HIVST (38%,
123 $n=498$). A third of those who used HIVST, reported receiving HIVST kits from other people
124 (35%, $243/685$). During the last HIVST conducted, 66% ($455/685$) were alone, 24%
125 ($162/685$) had a partner present, 9% ($65/685$) had a friend present and 1% ($4/685$) had a
126 family member present.

127

128 Overall, 64 men (5%) reported ever experiencing HIV test coercion: 8% ($52/685$) in men who
129 had used HIVST compared to 2% ($12/627$) for men who had not used HIVST ($p<0.001$).

130

131 Bivariable and multivariable logistic regression results are presented in Table 1. In summary,
132 men who reported HIV test coercion were more likely to have used HIVST (adjusted odds
133 ratio(AOR) 4.25 (95% confidence interval (CI):2.23-8.09), received a HIVST kit from
134 another person (AOR 3.47, 95% CI:1.90-6.32), primarily met sexual partners through
135 parks/public restrooms/public lawns (AOR 3.45, 95% CI:1.09-10.95), and reported
136 condomless sex in the last three months (AOR 2.38, 95% CI:1.43-3.98).

137

138 **DISCUSSION**

139 Our study suggests that HIVST may be associated with coercion among Chinese MSM. This
140 is consistent with qualitative studies on self-testing¹⁶, but to our knowledge has not been
141 described in quantitative research. The relationship between coercion and HIV self-testing
142 may be influenced by China's relatively permissive regulatory environment^{4,17}, few
143 formalized resources for self-testing, and underlying social contexts such as power
144 imbalances. Our findings underscore the importance for policies to be in place to monitor for
145 potential harms of HIV self-testing. Especially in settings where power imbalances may exist
146 among those seeking HIV testing, there is a risk of overriding the human rights of vulnerable
147 populations who may not report that they are being coerced⁷.

148

149 We also found that MSM with more condomless sex were more likely to experience coerced
150 HIV testing. This is the first report of this finding within the current literature on HIV test
151 coercion in MSM. One hypothesis to explain our findings may be that men force high-risk
152 sex partners to receive HIV testing, sometimes called “point-of-sex” testing. This trend has
153 been reported predominantly amongst MSM in the US.¹⁸⁻²⁰ MSM may use point-of-sex
154 testing as a risk reduction technique to screen sexual partners before sex, despite its limitation
155 related to the window period. MSM using point-of-sex testing reported a high yield of HIV
156 positive results (~10%) and high percentage of partners who were not aware that they were
157 HIV positive (~60%).¹⁹ Although there is enthusiasm for utilizing mutual partner testing to
158 increase awareness of risk and decrease condomless sex between discordant partners,²¹ future
159 studies on examining point-of-sex testing should also include measurements of the potential
160 harms of test coercion.

161

162 The study should be interpreted in light of some limitations. This was a quantitative study of
163 men reporting coercion, and further qualitative studies are needed to expand on the contexts
164 of coercion. Power relationships are not dichotomous and there may be a spectrum of agency
165 for choosing to test or not to test. Understanding power differentials is important as it may
166 impact on the recognition of what constitutes coercion. MSM living in China are a hidden
167 population, and we tried to maximize representativeness by sampling from multiple locations
168 and utilizing an anonymous online survey. However, these findings from an online sample of
169 MSM are unlikely to be representative of all MSM in China as men we sampled are younger
170 and better educated. Nevertheless, it indicates that a substantial number of young MSM in
171 China have used HIV self-test kits and highlights the possibility of HIV test coercion
172 amongst this subgroup of MSM who use gay social networking apps.

173

174 As countries continue to scale up HIV testing, including increasing access to HIVST, our
175 findings suggest that coercion may be occurring among some MSM. Policies should be in
176 place to monitor and measure for potential harms associated with HIV testing. Targeted
177 messaging in programs promoting HIV testing should emphasize that every HIV test should
178 be voluntary²². Future research should include more representative samples and an
179 assessment of the contexts that characterize coerced HIVST, in order to inform interventions
180 to prevent it.

181

182 **Competing interests**

183 All authors declare they do not have any competing interests.

184

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188

189 **Authors' contributions**

190 JDT, HL, and CL contributed to the conception and design of the study. CW, BY provided

191 oversight for data collection, and WM, DK, ML, GM, LY, and SH assisted in the data

192 collection. EL assisted with the literature search. JJO analysed the data and drafted the paper.

193 All authors revised the manuscript and approved the final version to be published.

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203

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259

260 **Table 1 – Factors associated with ever experiencing HIV test coercion in men who have sex with men in**
 261 **China, 2016 (N=1,312)**

Variable	Crude odds ratio	p value	Adjusted odds ratio*	p value
Demographics				
<i>Marital status</i>				
- Never married	1		1	
- Engaged or married	1.99 (1.01-3.93)	0.05	2.03 (0.90-4.58)	0.09
- Divorced or widowed	0.54 (0.13-2.25)	0.39	0.54 (0.12-2.53)	0.44
Sexual History				
<i>Sexual orientation</i>				
- non-gay	1		1	
- gay	0.72 (0.41-1.25)	0.24	0.70 (0.96-1.04)	0.21
<i>Disclosure of sexuality or sexual history with men (other than regular partner)</i>				
- No disclosure	1		1	
- Disclosure	1.25 (0.69-2.26)	0.46	1.26 (0.69-2.30)	0.46
<i>Disclosure of sexuality or sexual history with health providers</i>				
- No disclosure	1		1	
- Disclosure	1.07 (0.60-1.92)	0.82	1.09 (0.60-1.96)	0.79
<i>Sexual partners in last 12 months mainly from</i>				
- social media/website	1		1	
- friends	0.88 (0.37-2.09)	0.77	0.78 (0.32-1.88)	0.58
- pub, disco, club	2.23 (0.77-6.45)	0.14	1.90 (0.63-5.71)	0.25
- spa, bath house, sauna	3.13 (1.07-9.15)	0.04	2.94 (0.95-9.06)	0.06
- park, public restroom, lawn	4.17 (1.40-12.38)	0.01	3.45 (1.09-10.95)	0.04
- other	0.82 (0.20-3.47)	0.79	0.65 (0.15-2.81)	0.57
- unknown	0.27 (0.08-0.89)	0.03	0.33 (0.10-1.08)	0.07
<i>Condomless sex in last 3 months</i>	2.14 (1.18-3.88)	0.01	2.38 (1.43-3.98)	<0.001
<i>Casual partner in last 3 months</i>	1.64 (0.99-2.72)	0.06	1.65 (0.98-2.76)	0.06
<i>Community engagement in sexual health</i>				
- No engagement	1		1	
- Minimal engagement	2.29 (0.57-9.10)	0.24	2.07 (0.51-8.29)	0.31
- Moderate engagement	1.10 (0.33-3.74)	0.88	1.01 (0.29-3.45)	0.99
- Substantial engagement	2.65 (0.79-8.86)	0.11	2.38 (0.71-8.04)	0.16
HIV testing behaviour				
<i>Ever used HIV facility testing</i>				
- No facility HIV test	1		1	
- Facility HIV test	0.71 (0.37-1.35)		0.68 (0.35-1.32)	0.26
<i>Ever used HIVST</i>				
- No HIVST	1		1	
- HIVST	4.23 (2.24-8.00)	<0.001	4.25 (2.23-8.09)	<0.001
<i>Received HIVST kit from other people[#]</i>	3.50 (1.94-6.30)	<0.001	3.47 (1.90-6.32)	<0.001
<i>Partner present at last HIVST[#]</i>	1.21 (0.64-2.29)	0.56	1.14 (0.60-2.19)	0.69
<i>Friend present at last HIVST[#]</i>	1.54 (0.67-3.58)	0.31	1.48 (0.63-3.47)	0.37

262 HIVST = HIV self-test; *Adjusted for age, income, education, household residency status; [#] for 685 men who had HIV self-
 263 tested

264