

Original Paper

A Comparison of Mobile Social Media Promotion and Volunteer-Driven Strategies for Community Organizations Recruiting Men Who Have Sex with Men for HIV Testing in Zhejiang Province, China: Cross-Sectional Study Based on a Large-Scale Survey

Lin He¹, MA; Shaoqiang Jiang², BA; Tingting Jiang¹, MA; Wanjun Chen¹, MA; Jinlei Zheng¹, MA; Hui Wang¹, PhD; Chengliang Chai¹, MA

¹Zhejiang Provincial Center for Disease Control and Prevention, Hangzhou, China

²Coastal Service Center, Hangzhou, China

Corresponding Author:

Chengliang Chai, MA

Zhejiang Provincial Center for Disease Control and Prevention

3399 Bin Sheng Road, Binjiang District

Hangzhou, 310051

China

Phone: 86 87115193

Fax: 86 87115194

Email: chlchai@cdc.zj.cn

Abstract

Background: China has recently implemented a strategy to promote and facilitate community organization involvement in HIV prevention among men who have sex with men (MSM). Although community-based strategies have been shown to increase HIV testing uptake, the relative effectiveness of mobile social media promotion compared with volunteer-driven recruitment remains underexplored. Limited research has investigated how these strategies differentially affect MSM who have not undergone previous HIV testing.

Objective: This study aimed to compare the differences between a mobile social media promotion strategy and a volunteer-driven strategy for community organizations to recruit MSM for HIV testing.

Methods: A cross-sectional study was conducted from July to December 2023 among MSM in Zhejiang Province, China. Participants aged 16 years with an HIV-negative or unknown status were recruited either through a mobile social media promotion strategy or through a volunteer-driven strategy by a community organization. They completed a questionnaire that collected information on demographics, sexual behavior, and HIV testing history. All participants were tested for HIV after completing the questionnaire. A multivariate logistic regression model was used to identify factors associated with recruitment through mobile social media promotion.

Results: The study included 4600 MSM, of whom 3035 (66%) were recruited through the mobile social media strategy. Overall, 1.4% (66/4600) of participants tested positive for HIV, and 18.8% (865/4600) underwent HIV testing for the first time. Recruitment via the mobile social media promotion strategy was significantly associated with several factors: having only gay sexual partners (adjusted OR [aOR] 1.23, 95% CI 1.05-1.45), having more than 2 sexual partners in the past 3 months (aOR 1.74, 95% CI 1.42-2.11), frequently using rush poppers during sex (aOR 1.39, 95% CI 1.14-1.99), having a history of sexually transmitted infections (aOR 1.56, 95% CI 1.02-2.39), having awareness of pre-exposure prophylaxis (aOR 1.42, 95% CI 1.19-1.71), having awareness of postexposure prophylaxis (PEP; aOR 1.49, 95% CI 1.24-1.79), using mail-in HIV self-testing kits (aOR 2.02, 95% CI 1.77-2.31), testing HIV-positive (aOR 2.02, 95% CI 1.10-3.72), and first-time HIV testing (aOR 1.28, 95% CI 1.09-1.52).

Conclusions: Community organizations play a critical role in expanding HIV testing and identifying undiagnosed individuals infected with HIV. Compared to the volunteer-driven outreach, mobile social media promotion strategies had a higher proportion of first-time testers and a higher rate of HIV positivity. We recommend prioritizing mobile social media strategies in regions with limited LGBTQ+ organizations or HIV health services to increase HIV testing coverage and interventions among MSM.

KEYWORDS

men who have sex with men; MSM; internet; recruit; HIV testing; community organization; strategy; China; mobile phone

Introduction

Men who have sex with men (MSM) represent a significant proportion of individuals living with HIV in China. According to recent estimates, the national prevalence of HIV among MSM was 5.7% in 2018 [1] and rose to 7% in 2022 [2]. Moreover, the percentage of newly diagnosed HIV infections attributed to homosexual transmission increased from 2.5% in 2006 to 25.6% in 2022 [2]. To achieve the United Nations Program on HIV/AIDS 95-95-95 targets (95% diagnosis, 95% treatment, and 95% viral suppression) by 2030, a renewed focus on MSM is essential [3]. While China is on track to meet the second and third 95% targets (treatment and viral suppression) [4], achieving the goal of diagnosing 95% of individuals infected with HIV by 2030 remains a significant challenge. Our previous study demonstrated that 12.9% of MSM will have never undergone HIV testing by 2023 [5]. It is, therefore, crucial to identify MSM who have not been tested, implement targeted HIV education and testing, and expand testing efforts to facilitate early diagnosis. This approach is pivotal for China to meet its 2030 diagnostic target.

Historically, MSM in China has faced significant barriers to HIV awareness, intervention, and counseling services. Traditional social norms and cultural values make it difficult for MSM to disclose their sexual orientation [6], leading many to conceal their identity. This hidden population poses a challenge for the current HIV service network, which is managed by the Centers for Disease Control and Prevention (CDC) and various medical institutions [7,8]. In recent years, China has implemented a series of comprehensive measures aimed at preventing and controlling HIV infections among MSM. One of the primary strategies is to promote and facilitate community organizational involvement in HIV prevention and control initiatives [2]. These encompass the implementation of public education initiatives, disease prevention and intervention strategies, and the provision of testing and counseling services. The community organization is composed of MSM volunteers, which allows for forming trusting relationships and facilitates contact with the MSM population, thus bringing attention to this previously hidden demographic [9,10]. A previous study revealed that 567 MSM community-based organizations in China participated in initiatives funded by the AIDS fund for nongovernmental organizations, facilitating HIV testing for over 250,000 people by 2022 [11]. Of these, 7963 were newly diagnosed, representing 28.9% of all MSM HIV cases nationwide. The involvement of community organizations has increased the reach of MSM communities, facilitating greater access to HIV prevention services and the identification of new infections [12].

HIV testing is a highly effective intervention strategy [13]. The implementation of HIV testing can facilitate early diagnosis, prompt treatment, and subsequent transmission reduction [14]. Studies have shown that MSM who have been tested for HIV

are less likely to engage in high-risk sexual behaviors compared to those who have never been tested [15]. Consequently, a significant proportion of funding allocated to community organizations in China is directed toward HIV testing services [9]. Community organizations primarily use 3 methods to recruit MSM for HIV testing. The initial approach was a volunteer-driven strategy that involved active recruitment. Community-organized volunteers and peer educators were recruited from venues frequented by MSM, including parks, bars, and bathhouses, for in-person HIV testing and interventions. In addition, MSM who have not been tested for HIV for over 6 months are also mobilized for testing by these volunteers. Second, a mobile social media promotion or recruitment strategy is also used. Information on HIV promotion, prevention, and testing is disseminated through MSM websites, dating apps, and communication groups, which are then used to recruit MSM to offline service outlets. Alternatively, HIV self-testing kits may be ordered mobile and mailed home. Third, a regular testing strategy is implemented. Some MSM who were initially recruited through the aforementioned strategies continue to test regularly after receiving HIV education without the need for further mobilization by community organizations.

With the rapid growth of China's internet economy and the widespread use of smartphones, mobile dating apps for MSM have surged in popularity [10]. Many MSM now use the internet and dating apps to find sexual partners. This shift has changed HIV testing recruitment from in-person volunteer outreach to internet-based strategies. Studies have shown that the internet is an effective tool for recruiting MSM, especially those who have never been tested, thus expanding the reach of HIV testing and reducing the number of undiagnosed infections [16,17]. Zhejiang Province, an economically developed and thriving internet economy in China, relies heavily on community organizations to implement HIV prevention and provide testing for MSM. In 2023, approximately 66,000 HIV tests have been conducted among MSM in the province, accounting for about 10% of the national total [4]. Notably, over 90% of these tests are performed by community organizations. To improve testing coverage among MSM, these organizations must use a dual recruitment strategy that uses both mobile social promotion and volunteer-driven initiatives. This approach is essential for identifying and engaging MSM who have not yet been tested for HIV. This study, based on the findings of a large-scale survey, aimed to analyze the effectiveness of 2 recruitment strategies, which are mobile social media promotion and volunteer-driven outreach. The results of this analysis will provide a foundation for promoting HIV testing within communities and contribute to recruiting MSM who have never been tested for HIV in China.

Methods

Study Design

A cross-sectional study based on a large-scale survey was conducted among MSM between July and December 2023.

Study Participants

MSM were eligible to participate if they met certain criteria, which include being (1) 16 years or older, (2) reported having sex with men in the past year, (3) were HIV-negative or had an unknown HIV status, (4) received HIV testing as a direct result of mobile social media promotion or volunteer-driven recruitment, and (5) resided in Zhejiang Province, China.

Participant Recruitment and Data Collection

Sunshine Coast Public Welfare is a social service agency that employs 13 full-time and 22 part-time social workers, with over 400 registered volunteers. The organization established a digital HIV prevention service using location-based services. MSM in Zhejiang Province are invited to visit the official “Sunshine Test” account on WeChat, a popular Chinese communication platform, to request free HIV testing and prevention counseling. MSM can choose between mailed self-testing kits or visiting offline services for HIV testing. Full-time and part-time social workers are responsible for regularly recruiting a specified number of MSM for HIV testing. Meanwhile, registered volunteers assist in promoting HIV testing within the MSM community periodically.

Questionnaires

All individuals who engaged with Sunshine Test were required to complete a routine surveillance questionnaire consisting of 20 questions. These questions covered demographic information such as age, marital status, and education level, as well as sexual behavior including sexual roles (receptive, insertive, or both), number of sexual partners, use of rush poppers, sexual history, awareness of pre-exposure prophylaxis (PrEP) and PEP (postexposure prophylaxis), and HIV testing history.

Recruitment through direct engagement by social workers or registered volunteers was classified as “volunteer-driven recruitment.” Conversely, if MSM were recruited after encountering HIV prevention information posted by the community organization on internet platforms (such as dating apps, communication groups, or websites) and subsequently applied for testing, this was categorized as “mobile social media promotion recruitment.” If MSM had undergone an HIV test at the organization of their own volition, without being prompted by volunteers or mobile social media promotion, their case was

classified as a “regular test.” During the study, the participating MSM underwent repeated HIV testing on more than 2 occasions, but only the first record was included in the analysis. Details of the Sunshine Coast Public Welfare Program have been described in previous literature [10].

Statistical Analysis

Descriptive analyses were performed, with categorical variables presented as frequencies and proportions and continuous variables presented as median with IQR or mean with SD. The chi-square test (X^2) was used to assess significant differences in demographic characteristics between MSM recruited through mobile social media promotion and those recruited through volunteer-driven recruitment. Factors associated with differences in the sociodemographic characteristics of mobile social media promotion recruitment were included in multivariate logistic regression models, and adjusted odds ratios (aORs) with 95% CIs were calculated. Statistical significance was set at $P < .05$, with $\beta = 1$. All statistical analyses were conducted using SPSS (version 19.0; IBM Corp).

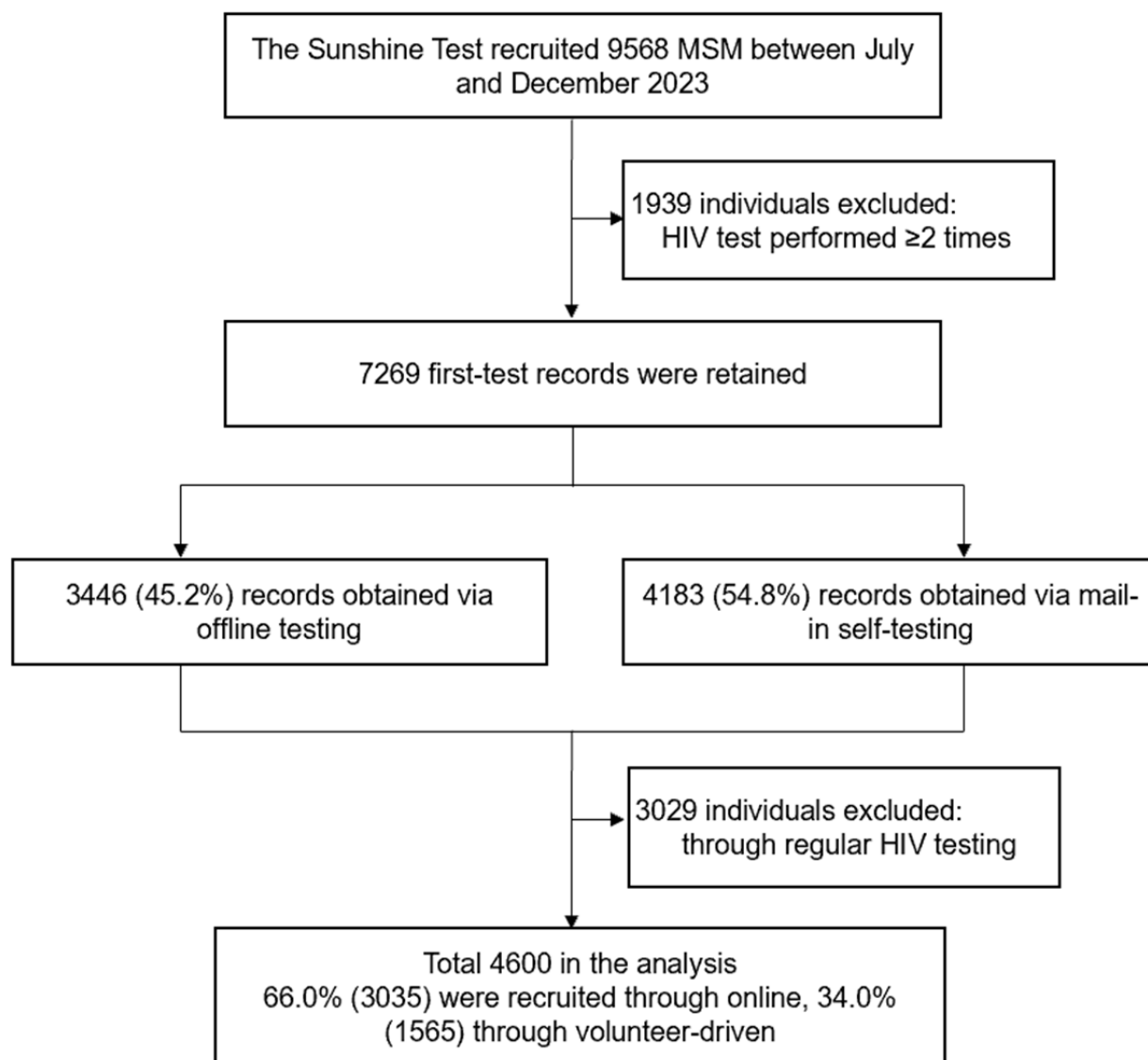
Ethical Considerations

This study was approved by the Zhejiang Provincial Centre for Disease Control and Prevention (approval number 2022-011-01). Written informed consent was obtained from all participants before survey completion, and participants had the ability to drop out anytime during the survey. All data were anonymous; participants received free HIV testing, health counseling, and no compensation; and all study procedures were conducted in accordance with approved guidelines and regulations.

Results

A total of 4600 MSM were enrolled in the study (Figure 1), of whom 3035 (66%) were recruited via mobile social media promotion and 1565 (34%) through volunteer-driven recruitment. The mean age of the participants was 30.0 (SD 9) years. Overall, 78.4% (3606/4600) were single, and 74.5% (3425/4600) had a college degree or higher education. Most participants (3455/4600, 75.1%) reported having male sexual partners. Over the past 3 months, 30.8% (1419/4600) reported having more than 2 sexual partners, and 30.7% (1410/4600) reported using rush poppers during sexual activity. In addition, 43.6% (2007/4600) were aware of their sexual partner's HIV status, 2.7% (126/4600) had a history of sexually transmitted infections (STIs), 47.2% (2169/4600) had used a mailed self-testing kit for HIV testing, 1.4% (66/4600) tested positive for HIV, and 18.8% (865/4600) were undergoing HIV testing for the first time (Table 1).

Figure 1. Study design. MSM: men who have sex with men.



Overall, 66% (3035/4600) of MSM recruited through mobile social media promotion were aged 20-29 years (1842/2719, 67.7%), single (2404/3606, 66.7%), had a master's degree or higher education (283/424, 66.7%), reported insertive anal sex (1037/1512, 68.6%), had exclusively gay sexual partners (2394/3455, 69.3%), had more than 2 sexual partners in the past 3 months (1001/1419, 70.5%), frequently used rush poppers

during sex (529/698, 75.8%), were consistently aware of their sexual partner's HIV status (1371/2007, 68.3%), had a history of STIs (96/126, 76.2%), had HIV testing through mail reagent self-testing (1592/2169, 73.4%), tested HIV-positive (52/66, 78.8%), and had been previously tested for HIV (592/865, 68.4%) (Table 1).

Table 1. Social demographic and behavioral characteristics among men who have sex with men who were recruited through mobile social media promotion and volunteer-driven recruitment strategy

Variables	Participants, n (%)	Number of mobile recruitments, n (%)	Number of volunteer-driven recruitment, n (%)	Chi-square (df)	P value
Overall	4600 (100)	3035 (66.0)	1565 (34.0)		
Age (years), IQR 27 (23-32)				9.5 (2)	.008
<20	306 (6.7)	190 (62.1)	116 (37.9)		
20-29	2719 (59.1)	1842 (67.7)	877 (32.3)		
30 years or older	1575 (34.2)	1003 (63.7)	572 (36.3)		
Marital status				3.5 (2)	.172
Single	3606 (78.4)	2404 (66.7)	1202 (33.3)		
Married	857 (18.6)	544 (63.5)	313 (36.5)		
Divorced or separated	137 (3.0)	87 (63.5)	50 (36.5)		
Education level				1.2 (3)	.750
High school and below	1175 (25.5)	760 (64.7)	415 (35.3)		
College	1175 (25.5)	779 (66.3)	396 (33.7)		
Bachelor's degree	1826 (39.7)	1213 (66.4)	613 (33.6)		
Master's degree or above	424 (9.2)	283 (66.7)	141 (33.3)		
Occupation				15.9 (3)	.001
Company employee	1605 (34.9)	1111 (69.2)	494 (30.8)		
Student	836 (18.2)	555 (66.4)	281 (33.6)		
Freelance	612 (13.3)	374 (61.1)	238 (38.9)		
Others	1547 (33.6)	995 (64.3)	552 (35.7)		
Sex roles				11.3 (2)	.004
Receptive anal sex	1003 (21.8)	675 (67.3)	328 (32.7)		
Both	2085 (45.3)	1323 (63.5)	762 (36.5)		
Insertive anal sex	1512 (32.9)	1037 (68.6)	475 (31.4)		
Sexuality of partner				67.9 (1)	<.001
Gay	3455 (75.1)	2394 (69.3)	1061 (30.7)		
Bisexual	1145 (24.9)	641 (56.0)	504 (44.0)		
Number of sexual partners in the past 3 months					
0	903 (19.6)	463 (51.3)	440 (48.7)	109.2 (2)	<.001
1	2278 (49.5)	1571 (69.0)	707 (31.0)		
2	1419 (30.8)	1001 (70.5)	418 (29.5)		
Condom use in the past 3 months				75.3 (3)	<.001
Every time	2364 (51.4)	1606 (67.9)	758 (32.1)		
Sometimes use	1122 (24.4)	777 (69.3)	345 (30.7)		
No sex	822 (17.9)	438 (53.3)	384 (46.7)		
Never use	292 (6.3)	214 (73.3)	78 (26.7)		
Rush poppers usage frequency during sex activity				46.2 (2)	<.001
Frequently use	698 (15.2)	529 (75.8)	169 (24.2)		
Occasional use	712 (15.5)	495 (69.5)	217 (30.5)		
Never	3190 (69.3)	2011 (63.0)	1179 (37.0)		
Awareness of partner's HIV status				36.8 (2)	<.001

Variables	Participants, n (%)	Number of mobile recruitments, n (%)	Number of volunteer-driven recruitment, n (%)	Chi-square (<i>df</i>)	<i>P</i> value
Yes	2007 (43.6)	1371 (68.3)	636 (31.7)		
Part	1516 (33.0)	1036 (68.3)	480 (31.7)		
No	1077 (23.4)	628 (58.3)	449 (41.7)		
History of STIs^a				6.0 (1)	.014
No	4474 (97.3)	2939 (65.7)	1535 (34.3)		
Yes	126 (2.7)	96 (76.2)	30 (23.8)		
Awareness of PrEP^b				108.9 (1)	<.001
Yes	3298 (71.7)	2327 (70.6)	971 (29.4)		
No	1302 (28.3)	708 (54.4)	594 (45.6)		
Awareness of PEP^c				118.4 (1)	<.001
Yes	3402 (74.0)	2398 (70.5)	1004 (29.5)		
No	1198 (26.0)	637 (53.2)	561 (46.8)		
HIV testing pathway				100.7 (1)	<.001
Mailed self-testing	2169 (47.2)	1592 (73.4)	577 (26.6)		
Offline testing	2431 (52.8)	1443 (59.4)	988 (40.6)		
HIV status				4.9 (1)	.027
Positive	66 (1.4)	52 (78.8)	14 (21.2)		
Negative	4534 (98.6)	2983 (65.8)	1551 (34.2)		
Ever first-time HIV testing				2.9 (1)	.090
No	3735 (81.2)	2443 (65.4)	1292 (34.6)		
Yes	865 (18.8)	592 (68.4)	273 (31.6)		

^aSTIs: sexually transmitted infections.

^bPrEP: pre-exposure prophylaxis.

^cPEP: postexposure prophylaxis.

Overall, among the MSM recruited through social media, 78.9% (2394/3035) had gay sexual partners, 33% (1001/3035) had more than 2 sexual partners, 17.4% (529/3035) frequently used rush poppers during sex, 3.2% (96/3035) had a history of STIs, 76.7% (2327/3035) had awareness of PrEP, 79% (2398/3035)

had awareness of PEP, 1.7% (52/3035) tested HIV-positive, and 19.5% (592/3035) had been tested for HIV for the first time, all of which were higher than those of the volunteer recruitment (Table 2).

Table 2. Factors associated with mobile social media promotion compared with volunteer-driven recruitment strategy among men who have sex with men.

Variables	Number of mobile social media recruitments, n (%)	Number of volunteer-driven recruitments, n (%)	aOR ^a (95% CI)	P value
Overall	3035 (100)	1565 (100)		
Sexuality of partner				
Gay	2394 (78.9)	1061 (67.8)	1.23 (1.05-1.45)	.013
Bisexual	641 (21.1)	504 (32.2)	1	
Number of sexual partners in the past 3 months				
0	463 (15.3)	440 (28.1)	1	
1	1571 (51.8)	707 (45.2)	1.66 (1.38-1.00)	<.001
2	1001 (33.0)	418 (26.7)	1.74 (1.42-2.11)	<.001
Rush poppers usage frequency during sex activity				
Frequently use	529 (17.4)	169 (10.8)	1.39 (1.14-1.99)	.001
Occasional use	495 (16.3)	217 (13.9)	1.12 (0.93-1.35)	.225
Never	2011 (66.3)	1179 (75.3)	1	
History of STIs^b				
No	2939 (96.8)	1535 (98.1)	1	
Yes	96 (3.2)	96 (1.9)	1.56 (1.02-2.39)	.040
Awareness of PrEP^c				
Yes	2327 (76.7)	971 (62.0)	1.42 (1.19-1.71)	<.001
No	708 (23.3)	594 (38.0)	1	
Awareness of PEP^d				
Yes	2398 (79.0)	1004 (64.2)	1.49 (1.24-1.79)	<.001
No	637 (21.0)	561 (35.8)	1	
HIV status				
Positive	52 (1.7)	14 (0.9)	2.02 (1.10-3.72)	.024
Negative	2983 (98.3)	1551 (99.1)	1	
Ever first-time HIV testing				
No	2443 (80.5)	1292 (82.6)	1	
Yes	592 (19.5)	273 (17.4)	1.28 (1.09-1.52)	.003

^aaOR: adjusted odds ratio.

^bSTI: sexually transmitted infections.

^cPrEP: pre-exposure prophylaxis.

^dPEP: postexposure prophylaxis.

In multivariate logistic regression analysis, the following factors were significantly associated with mobile social media recruitment: having only gay sexual partners (aOR 1.23, 95% CI 1.05-1.45), having more than 2 sexual partners in the past 3 months (aOR 1.74, 95% CI 1.42-2.11), frequently using rush poppers during sex (aOR 1.39, 95% CI 1.14-1.99), having a history of STIs (aOR 1.56, 95% CI 1.02-2.39), having awareness

of PrEP (aOR 1.42, 95% CI 1.19-1.71), having awareness of PEP (aOR 1.49, 95% CI 1.24-1.79), testing positive for HIV (aOR 2.02, 95% CI 1.10-3.72), and undergoing HIV testing for the first time (aOR 1.28, 95% CI 1.09-1.52) (Table 2). MSM who were recruited by the mobile platform were more likely (aOR 2.02, 95% CI 1.77-2.31) to take the mailed HIV self-test (Table 3).

Table 3. Factors associated with mailed self-testing compared with offline testing among men who have sex with men.

Variables	Participants, n (%)	Number of mailed self-testing, n (%)	Number of offline testings, n (%)	Chi-square (<i>df</i>)	<i>P</i> value	aOR ^a (95% CI)
Overall	4600 (100)	2169 (47.2)	2431 (52.8)			
Age (years), IQR 27 (23-32)				97.7 (2)	<.001	
<20	306 (6.7)	132 (43.1)	174 (56.9)		.092	1.30 (0.96-1.76)
20-29	2719 (59.1)	1444 (53.1)	1275 (46.9)		<.001	1.43 (1.22-1.68)
≥30	1575 (34.2)	593 (37.7)	982 (62.3)			1
Marital status				99.8 (2)	<.001	
Single	3606 (78.4)	1836 (50.9)	1770 (49.1)			1
Married	857 (18.6)	275 (32.1)	582 (67.9)		<.001	0.59 (0.49-0.72)
Divorced or separated	137 (3.0)	58 (42.3)	79 (57.7)		.876	1.03 (0.71-1.50)
Education level				122.8 (3)	<.001	
High school and below	1175 (25.5)	402 (34.2)	773 (65.8)			1
College	1175 (25.5)	550 (46.8)	625 (53.2)		<.002	1.34 (1.11-1.61)
Bachelor's degree	1826 (39.7)	993 (54.4)	833 (45.6)		<.001	1.62 (1.35-1.93)
Master's degree or above	424 (9.2)	224 (52.8)	200 (47.2)		<.001	1.67 (1.29-2.15)
Occupation				59.8 (3)	<.001	
Company employee	1605 (34.9)	865 (53.9)	740 (46.1)		.006	1.25 (1.07-1.46)
Student	836 (18.2)	411 (49.2)	425 (50.8)		.685	0.96 (0.78-1.18)
Freelance	612 (13.3)	250 (40.8)	362 (59.2)		.485	0.93 (0.76-1.14)
Others	1547 (33.6)	643 (41.6)	904 (58.4)			1
Sex roles				29.5 (2)	<.001	
Receptive anal sex	1003 (21.8)	528 (52.6)	475 (47.4)			1
Both	2085 (45.3)	896 (43.0)	1189 (57.0)		<.001	0.64 (0.54-0.76)
Insertive anal sex	1512 (32.9)	745 (49.3)	767 (50.7)		.258	0.91 (0.76-1.08)
Sexuality of partner				0.2 (1)	.638	
Gay	3455 (75.1)	1636 (47.4)	1819 (52.6)			1
Bisexual	1145 (24.9)	533 (46.6)	612 (53.4)		<.001	1.45 (1.22-1.72)
Number of sexual partners in the past 3 months				24.3 (2)	<.001	
0	903 (19.6)	402 (44.5)	501 (55.5)			1
1	2278 (49.5)	1021 (44.8)	1257 (55.2)		.822	1.03 (0.82-1.29)
2	1419 (30.8)	746 (52.6)	673 (47.4)		.013	1.34 (1.05-1.72)
Condom use in the past 3 months				24.6 (3)	<.001	
Every time	2364 (51.4)	1050 (44.4)	1314 (55.6)			1
Sometimes use	1122 (24.4)	594 (52.9)	528 (47.1)		<.001	1.49 (1.28-1.74)
No sex	822 (17.9)	376 (45.7)	446 (54.3)		.095	1.22 (0.97-1.53)
Never use	292 (6.3)	149 (51.0)	143 (49.0)		.013	1.39 (1.07-1.80)
Rush poppers usage frequency during sex activity				36.3 (2)	<.001	
Frequently use	698 (15.2)	278 (39.8)	420 (60.2)			1
Occasional use	712 (15.5)	397 (55.8)	315 (44.2)		<.001	1.93 (1.54-2.41)
Never	3190 (69.3)	1494 (46.8)	1696 (53.2)		<.001	1.57 (1.31-1.88)
Awareness of partner's HIV status				8.5 (2)	.014	
Yes	2007 (43.6)	956 (47.6)	1051 (52.4)			— ^e

Variables	Participants, n (%)	Number of mailed self-testing, n (%)	Number of offline testings, n (%)	Chi-square (<i>df</i>)	<i>P</i> value	aOR ^a (95% CI)
Part	1516 (33.0)	745 (49.1)	771 (50.9)			—
No	1077 (23.4)	468 (43.5)	609 (56.5)			—
History of STIs^b				6.8 (1)	.009	
No	4474 (97.3)	2124 (47.5)	2350 (52.5)		<.003	1.80 (1.22-2.65)
Yes	126 (2.7)	45 (35.7)	81 (64.3)			1
Awareness of PrEP^c				3.6 (1)	.058	
Yes	3298 (71.7)	1584 (48.0)	1714 (52.0)			—
No	1302 (28.3)	585 (44.9)	717 (55.1)			—
Awareness of PEP^d				5.8 (1)	.016	
Yes	3402 (74.0)	1640 (48.2)	1762 (51.8)			—
No	1198 (26.0)	529 (44.2)	669 (55.8)			—
HIV status				25.0 (1)	<.001	
Positive	66 (1.4)	11 (16.7)	55 (83.3)			1
Negative	4534 (98.6)	2158 (47.6)	2376 (52.4)		<.001	5.04 (2.55-9.96)
Ever first-time HIV testing				51.4 (1)	<.001	
No	3735 (81.2)	1856 (49.7)	1879 (50.3)		<.001	1.75 (1.48-2.06)
Yes	865 (18.8)	313 (36.2)	552 (63.8)			1
Recruitment				100.7 (1)	<.001	
Volunteer-driven	1565 (34.0)	577 (36.9)	988 (63.1)			1
Mobile recruitment	3035 (66.0)	1592 (52.5)	1443 (47.5)		<.001	2.02 (1.77-2.31)

^aaOR: adjusted odds ratio.

^bSTI: sexually transmitted infections.

^cPrEP: pre-exposure prophylaxis.

^dPEP: postexposure prophylaxis.

^eNot included in multivariate logistic regression analysis.

Discussion

Principal Results

This study compared the sociodemographic and behavioral characteristics of MSM who were recruited through 2 different recruitment strategies by community organizations to engage in HIV testing in Zhejiang Province, China. The strategies examined were a mobile social media promotion strategy and a volunteer-driven recruitment strategy. The findings indicated that 66% (3035/4600) of MSM were recruited through mobile social media promotion, while both strategies together reached 18.8% (865/4600) of MSM who had never been tested for HIV. Consistent with previous studies [18], community organizations proved effective in increasing HIV testing rates among MSM, particularly those who had not been tested before. The implementation of both strategies successfully expanded intervention coverage and recruited MSM who had not been previously tested for HIV. Furthermore, ongoing support for community organizations is recommended to facilitate the implementation of MSM prevention and control initiatives.

Comparison With Previous Work

Our findings revealed a higher proportion of individuals undergoing their first HIV test (592/3035, 19.5% vs 273/1565, 17.4%) and a higher prevalence of HIV-positive results (52/3035, 1.7% vs 14/1565, 0.9%) among those engaged via mobile social media promotions compared to those recruited through volunteer-driven initiatives. These observations are consistent with previous studies and empirical data. A meta-analysis demonstrated a 50% increase in HIV testing uptake following social media interventions [19], and another study showed a 22% increase in testing through mobile platforms [20], particularly among MSM engaging in high-risk behaviors. In these populations, the HIV-positive rate was 3.5% [21]. These findings suggest that mobile social media promotion may be an effective approach for recruiting MSM, improving HIV-testing coverage, and identifying individuals infected with HIV, particularly those who have not previously undergone HIV testing. As the proportion of MSM who use the internet and dating software continues to grow, it may be beneficial to expand the use of mobile social media promotion strategies to enhance HIV testing among MSM and facilitate the identification of more individuals infected with HIV. This could

be a crucial step toward achieving the goal of diagnosing 95% of individuals infected with HIV by 2030.

Similar to previous studies [22,23], our findings indicate that MSM recruited through mobile social media were more likely to use mail-based HIV self-testing kits. Mobile promotion strategies can facilitate the recruitment of MSM who have not accessed HIV testing services by providing convenient mail-in self-testing kits, thus increasing overall testing and identifying more individuals infected with HIV. Another study demonstrated that HIV self-testing services have the potential to enhance test uptake and reduce undiagnosed infections [24]. It would be beneficial to provide targeted outreach to MSM, such as offering HIV self-testing [25]. The utilization of social media platforms may prove effective in enhancing HIV self-testing rates among MSM aged ≤ 35 years [26]. Nevertheless, research has indicated that mobile social media may not necessarily increase the rate of HIV testing [27]. This may be attributed to the fact that the testing rate may not be enhanced by repeated HIV publicity and intervention in large cities but rather in areas where HIV testing is not easily accessible and where supportive gay social networks and health professionals are scarce. Therefore, priority should be given to implementing mobile social media promotion in areas lacking LGBTQ+ organizations or HIV health services. This approach can facilitate MSM recruitment, thereby increasing intervention coverage and improving HIV testing. Concurrently, it is also recommended to continue increasing publicity about HIV self-testing and to provide convenient self-testing services.

Consistent with other studies [28,29], we found that MSM recruited via mobile social media promotion were more aware of PrEP and PEP. Dating apps and social media have been identified as underutilized tools for increasing PrEP awareness, uptake, and knowledge among MSM [28,29]. PrEP and PEP represent effective prevention tools for individuals at high risk of HIV exposure, effectively reducing HIV infection and transmission [30]. Since 2021, PrEP and PEP have been widely used in China [31], with much of the advertising and promotion happening mobile. This has substantially increased awareness among MSM using the Internet. This study demonstrated that most MSM initially learned about PrEP through mobile sources [32]. Efforts should be made to further promote PrEP and PEP through mobile platforms while also disseminating preventive information through offline volunteer-driven strategies.

Our findings also revealed that MSM recruited mobile were more likely to report using rush poppers, a recreational drug that has gained considerable popularity among MSM [33], and their rate of use has continued to increase in China [34]. The use of rush poppers has been linked to abnormal arousal and pleasure, and prolonged sexual activity; these factors may increase the likelihood of engaging in unprotected sexual activity with consequent adverse outcomes such as HIV infection [30]

and transmission [35]. Furthermore, a greater proportion of MSM seeking sexual activity through social media have reported recreational drug use compared to those using traditional venues [21]. Therefore, it is recommended that internet-based HIV interventions include information on the risks associated with rush poppers and their link to HIV transmission to raise awareness and reduce high-risk behaviors.

The study also revealed that MSM recruited mobile had more sexual partners and a higher prevalence of STIs compared to those recruited through volunteer-driven strategies. A meta-analysis conducted in China revealed that MSM who engage in substance abuse are more likely to seek sexual partners through the internet or social media and engage in unprotected anal intercourse [36]. One potential explanation for this is that the volunteer-driven strategy for MSM tends to focus on offline recruitment in venues such as bars, parks, and bathhouses, where social circles are relatively limited. The advent of the Internet has provided MSM with more opportunities to search for sexual partners. Mobile social media have demonstrated efficacy as a tool for increasing PrEP use [29] and HIV-testing uptake [32]. While PrEP reduces the risk of HIV infection, it does not prevent STIs [37] and may even increase the risk due to reduced condom use and increased high-risk sexual behaviors [38]. Therefore, alongside PrEP promotion, other targeted interventions promoting condom use and awareness of STI risks should be integrated into internet-based HIV prevention efforts.

Limitations

First, the participants recruited by the community organization were primarily younger MSM who use the internet, meaning older MSM (particularly those over 50) were underrepresented. Future research should explore recruitment strategies targeting older MSM who do not engage mobile. Second, the costs associated with the human and financial resources invested in these recruitment strategies were not assessed. Further research on the cost-effectiveness of these strategies is necessary. Finally, the study relied on routine surveillance questionnaires, which may not have captured all relevant factors influencing the effectiveness of the 2 investigated recruitment strategies.

Conclusions

Community organizations effectively use mobile social media promotion and volunteer-driven strategies to recruit MSM, playing an important role in improving HIV testing and identifying undiagnosed individuals infected with HIV. There are notable differences in recruitment outcomes between the 2 strategies, with mobile social media promotion leading to a higher proportion of first-time HIV testing and HIV-positive individual identification. In areas where LGBTQ+ organizations or HIV health services are scarce, mobile social media promotion should be prioritized to increase MSM recruitment and expand the coverage of HIV interventions.

Acknowledgments

We express our gratitude to the participants and Sunshine Coast Public Welfare for their contributions to the study. The study was funded by a grant from the Health Science and Technology Project in Zhejiang Province Social (2023KY632, 2021RC048), Zhejiang Science and Technology Plan for Disease Prevention and Control (project number 2025JK006).

Data Availability

The datasets generated during and/or analyzed during this study are available from the corresponding author on reasonable request.

Authors' Contributions

LH conceived of the study design and coordinated the conduct of this research in the field. LH performed the statistical analysis and drafted the manuscript. CC reviewed and revised the manuscript. SJ, TJ, WC, JZ, and WC designed the research and played a major role in the survey. All of the authors read and approved the final manuscript.

Conflicts of Interest

None declared.

References

1. Dong MJ, Peng B, Liu ZF, Ye QN, Liu H, Lu XL, et al. The prevalence of HIV among MSM in China: a large-scale systematic analysis. *BMC Infectious Diseases*. Nov 27, 2019;19(1):1-20. [FREE Full text] [doi: [10.1186/s12879-019-4559-1](https://doi.org/10.1186/s12879-019-4559-1)] [Medline: [31775654](https://pubmed.ncbi.nlm.nih.gov/31775654/)]
2. Han M. Analysis of the epidemic situation of AIDS in China and prospects for its prevention and control. *J AIDS STD*. Mar 15, 2023;29(03):247-250.
3. Stannah J, Soni N, Lam JKS, Giguère K, Mitchell KM, Kronfli N, et al. Trends in HIV testing, the treatment cascade, and HIV incidence among men who have sex with men in Africa: a systematic review and meta-analysis. *Lancet HIV*. Aug 10, 2023;10(8):e528-e542. [FREE Full text] [doi: [10.1016/S2352-3018\(23\)00111-X](https://doi.org/10.1016/S2352-3018(23)00111-X)] [Medline: [37453439](https://pubmed.ncbi.nlm.nih.gov/37453439/)]
4. CCFD: HIV prevention and control progress report. National Center For AIDS STD Control And Prevention. URL: <https://www.cdc.gov/hiv/pdf/policies/progressreports/cdc-hiv-preventionprogressreport.pdf> [accessed 2025-01-18]
5. He L, Jiang T, Chen W, Jiang S, Zheng J, Chen W, et al. Examining HIV testing coverage and factors influencing first-time testing among men who have sex with men in Zhejiang province, China: cross-sectional study based on a large internet survey. *JMIR Public Health Surveill*. Jun 14, 2024;10:1-20. [FREE Full text] [doi: [10.2196/56906](https://doi.org/10.2196/56906)] [Medline: [38875001](https://pubmed.ncbi.nlm.nih.gov/38875001/)]
6. He L, Pan X, Yang J, Ma Q, Jiang J, Wang W, et al. HIV risk behavior and HIV testing among rural and urban men who have sex with men in Zhejiang Province, China: a respondent-driven sampling study. *PLoS One*. Apr 2, 2020;15(4):e0231026. [FREE Full text] [doi: [10.1371/journal.pone.0231026](https://doi.org/10.1371/journal.pone.0231026)] [Medline: [32240244](https://pubmed.ncbi.nlm.nih.gov/32240244/)]
7. Campbell CK, Lippman SA, Moss N, Lightfoot M. Strategies to increase HIV testing among MSM: a synthesis of the literature. *AIDS Behav*. Aug 22, 2018;22(8):2387-2412. [FREE Full text] [doi: [10.1007/s10461-018-2083-8](https://doi.org/10.1007/s10461-018-2083-8)] [Medline: [29550941](https://pubmed.ncbi.nlm.nih.gov/29550941/)]
8. Solomon SS, Solomon S, McFall AM, Srikrishnan AK, Anand S, Verma V, et al. Indian National Collaboration on AIDS Study. Integrated HIV testing, prevention, and treatment intervention for key populations in India: a cluster-randomised trial. *Lancet HIV*. May 1, 2019;6(5):e283-e296. [FREE Full text] [doi: [10.1016/S2352-3018\(19\)30034-7](https://doi.org/10.1016/S2352-3018(19)30034-7)] [Medline: [30952565](https://pubmed.ncbi.nlm.nih.gov/30952565/)]
9. Fan EL. HIV testing as prevention among MSM in China: the business of scaling-up. *Glob Public Health*. Feb 5, 2014;9(1-2):85-97. [FREE Full text] [doi: [10.1080/17441692.2014.881520](https://doi.org/10.1080/17441692.2014.881520)] [Medline: [24498955](https://pubmed.ncbi.nlm.nih.gov/24498955/)]
10. Cao B, Liu C, Durvasula M, Tang W, Pan S, Saffer AJ, et al. Social media engagement and HIV testing among men who have sex with men in China: a nationwide cross-sectional survey. *J Med Internet Res*. Jul 19, 2017;19(7):e251. [FREE Full text] [doi: [10.2196/jmir.7251](https://doi.org/10.2196/jmir.7251)] [Medline: [28724510](https://pubmed.ncbi.nlm.nih.gov/28724510/)]
11. Jin J, Li J, Dai S. Effectiveness of social organizations on intervention for detecting MSM in China. *Chin J AIDS STD* 2024. May 15, 2024;30(05):503-507.
12. Zhang W, Hu Q, Tang W, Jin X, Mao X, Lu T, et al. HIV self-testing programs to men who have sex with men delivered by social media key opinion leaders and community-based organizations are both effective and complementary: a national pragmatic study in China. *J Acquir Immune Defic Syndr*. Aug 15, 2020;84(5):453-462. [doi: [10.1097/QAI.0000000000002375](https://doi.org/10.1097/QAI.0000000000002375)] [Medline: [32692103](https://pubmed.ncbi.nlm.nih.gov/32692103/)]
13. Booton RD, Ong JJ, Lee A, Liu A, Huang W, Wei C, et al. Modelling the impact of an HIV testing intervention on HIV transmission among men who have sex with men in China. *HIV Med*. Jan 28, 2021;22(6):467-477. [FREE Full text] [doi: [10.1111/hiv.13063](https://doi.org/10.1111/hiv.13063)] [Medline: [33511687](https://pubmed.ncbi.nlm.nih.gov/33511687/)]
14. Cohen MS, Gamble T, McCauley M. Prevention of HIV transmission and the HPTN 052 study. *Annu Rev Med*. Jan 27, 2020;71:347-360. [doi: [10.1146/annurev-med-110918-034551](https://doi.org/10.1146/annurev-med-110918-034551)] [Medline: [31652410](https://pubmed.ncbi.nlm.nih.gov/31652410/)]
15. Reitsema M, Heijne J, Visser M, van Sighem A, Schim van der Loeff M, Op de Coul ELM, et al. Impact of frequent testing on the transmission of HIV and among men who have sex with men: a mathematical modelling study. *Sex Transm Infect*. Jul 16, 2020;96(5):361-367. [doi: [10.1136/sextrans-2018-053943](https://doi.org/10.1136/sextrans-2018-053943)] [Medline: [31801895](https://pubmed.ncbi.nlm.nih.gov/31801895/)]
16. Young S, Cumberland W, Singh P, Coates T. A peer-led online community to increase HIV self-testing among African American and Latinx MSM: a randomized controlled trial. *J Acquir Immune Defic Syndr*. May 1, 2022;90(1):20-26. [FREE Full text] [doi: [10.1097/QAI.0000000000002919](https://doi.org/10.1097/QAI.0000000000002919)] [Medline: [35044989](https://pubmed.ncbi.nlm.nih.gov/35044989/)]

17. LeGrand S, Muessig K, Horvath K, Rosengren A, Hightow-Weidman LB. Using technology to support HIV self-testing among MSM. *Curr Opin HIV AIDS*. Sep 1, 2017;12(5):425-431. [FREE Full text] [doi: [10.1097/COH.0000000000000400](https://doi.org/10.1097/COH.0000000000000400)] [Medline: [28617712](https://pubmed.ncbi.nlm.nih.gov/28617712/)]
18. Holland CE, Papworth E, Billong SC, Kassegne S, Petitbon F, Mondoleba V, et al. Access to HIV services at non-governmental and community-based organizations among men who have sex with men (MSM) in Cameroon: an integrated biological and behavioral surveillance analysis. *PLoS One*. Apr 23, 2015;10(4):e0122881. [FREE Full text] [doi: [10.1371/journal.pone.0122881](https://doi.org/10.1371/journal.pone.0122881)] [Medline: [25906046](https://pubmed.ncbi.nlm.nih.gov/25906046/)]
19. Cao B, Gupta S, Wang J, Hightow-Weidman LB, Muessig KE, Tang W, et al. Social media interventions to promote HIV testing, linkage, adherence, and retention: systematic review and meta-analysis. *J Med Internet Res*. Nov 24, 2017;19(11):e394. [FREE Full text] [doi: [10.2196/jmir.7997](https://doi.org/10.2196/jmir.7997)] [Medline: [29175811](https://pubmed.ncbi.nlm.nih.gov/29175811/)]
20. Biello KB, Daddario SR, Hill-Rorie J, Futterman D, Sullivan PS, Hightow-Weidman L, et al. Uptake and acceptability of MyChoices: results of a pilot RCT of a mobile app designed to increase HIV testing and PrEP uptake among young American MSM. *AIDS Behav*. Jul 13, 2022;26(12):3981-3990. [doi: [10.1007/s10461-022-03724-3](https://doi.org/10.1007/s10461-022-03724-3)] [Medline: [35829971](https://pubmed.ncbi.nlm.nih.gov/35829971/)]
21. Chiou PY, Ko NY, Chien CY. Mobile HIV testing through social networking platforms: comparative study. *J Med Internet Res*. Mar 26, 2021;23(3):e25031. [FREE Full text] [doi: [10.2196/25031](https://doi.org/10.2196/25031)] [Medline: [33769298](https://pubmed.ncbi.nlm.nih.gov/33769298/)]
22. Wang Z, Chan PSF, Xin M, Fang YY, Chidgey A, Yu F, et al. An online intervention promoting HIV testing service utilization among Chinese men who have sex with men during the COVID-19 pandemic: a quasi-experimental study. *AIDS Behav*. Jun 7, 2024;28(Suppl 1):77-89. [FREE Full text] [doi: [10.1007/s10461-023-04100-5](https://doi.org/10.1007/s10461-023-04100-5)] [Medline: [37284925](https://pubmed.ncbi.nlm.nih.gov/37284925/)]
23. Zhou H, Zhu YY, Gao YY, Chu ZX, Chen S, Liu M, et al. Online distribution of HIV self-testing kits to promote HIV testing among men who have sex with men discontinuing pre-exposure prophylaxis after demonstration project completion in China: a multicentre open-label randomized controlled trial. *Lancet Reg Health West Pac*. Oct 14, 2023;41:100922. [FREE Full text] [doi: [10.1016/j.lanwpc.2023.100922](https://doi.org/10.1016/j.lanwpc.2023.100922)] [Medline: [37867621](https://pubmed.ncbi.nlm.nih.gov/37867621/)]
24. Lightfoot MA, Campbell CK, Moss N, Treves-Kagan S, Agnew E, Kang Dufour MS, et al. Using a social network strategy to distribute HIV self-test kits to African American and latino MSM. *J Acquir Immune Defic Syndr*. Sep 1, 2018;79(1):38-45. [FREE Full text] [doi: [10.1097/QAI.0000000000001726](https://doi.org/10.1097/QAI.0000000000001726)] [Medline: [29771792](https://pubmed.ncbi.nlm.nih.gov/29771792/)]
25. Noble M, Jones AM, Bowles K, DiNunno EA, Tregear SJ. HIV testing among internet-using MSM in the United States: systematic review. *AIDS Behav*. Feb 1, 2017;21(2):561-575. [doi: [10.1007/s10461-016-1506-7](https://doi.org/10.1007/s10461-016-1506-7)] [Medline: [27498198](https://pubmed.ncbi.nlm.nih.gov/27498198/)]
26. Wang L, Podson D, Chen Z, Lu H, Wang V, Shepard C, et al. Using social media to increase HIV testing among men who have sex with men - Beijing, China, 2013-2017. *MMWR Morb Mortal Wkly Rep*. May 1, 2019;68(21):478-482. [FREE Full text] [doi: [10.15585/mmwr.mm6821a3](https://doi.org/10.15585/mmwr.mm6821a3)] [Medline: [31145721](https://pubmed.ncbi.nlm.nih.gov/31145721/)]
27. Del Río-González AM, Zea MC, Calabrese SK, Betancourt F, Pacheco-Cabrales J, Estrada-Santiago Y, et al. Development and evaluation of an online education-entertainment intervention to increase knowledge of HIV and uptake of HIV testing among Colombian men who have sex with men (MSM). *Int J Environ Res Public Health*. Feb 1, 2021;18(4):1811. [FREE Full text] [doi: [10.3390/ijerph18041811](https://doi.org/10.3390/ijerph18041811)] [Medline: [33673321](https://pubmed.ncbi.nlm.nih.gov/33673321/)]
28. Adan MA, Psaros C, Chamberlin G, Zions D, Iyer S, Platt L, et al. Swiping right on PrEP: a qualitative study of MSM preferences for PrEP public health messaging on dating apps. *AIDS Care*. Apr 22, 2024;36(8):1135-1147. [FREE Full text] [doi: [10.1080/09540121.2024.2343761](https://doi.org/10.1080/09540121.2024.2343761)] [Medline: [38648528](https://pubmed.ncbi.nlm.nih.gov/38648528/)]
29. Kudrati SZ, Hayashi K, Taggart T. *AIDS Behav*. May 3, 2021;25(12):4225-4234. [FREE Full text] [doi: [10.1007/s10461-021-03287-9](https://doi.org/10.1007/s10461-021-03287-9)] [Medline: [33939035](https://pubmed.ncbi.nlm.nih.gov/33939035/)]
30. Guo W, Li Y, Zhou N, Wu GH, Chang WH, Huan XP, et al. [Risk factors related to HIV new infections among men who have sex with men in a cohort study] [Article in Chinese]. *Zhonghua Liu Xing Bing Xue Za Zhi*. Jan 15, 2018;39(1):16-20. [doi: [10.3760/cma.j.issn.0254-6450.2018.01.003](https://doi.org/10.3760/cma.j.issn.0254-6450.2018.01.003)] [Medline: [29374888](https://pubmed.ncbi.nlm.nih.gov/29374888/)]
31. Xu J, Huang X, Liu X. Expert consensus on pre exposure prophylaxis for HIV in China. *Chinese Journal of AIDS & STD*. Nov 15, 2020;26(11):7.
32. Gebru NM, Benvenuti MC, Rowland BHP, Kalkat M, Chauca PG, Leeman RF. Relationships among substance use, sociodemographics, pre-exposure prophylaxis (PrEP) awareness and related attitudes among young adult men who have sex with men. *Subst Use Misuse*. Feb 21, 2022;57(5):786-798. [FREE Full text] [doi: [10.1080/10826084.2022.2040030](https://doi.org/10.1080/10826084.2022.2040030)] [Medline: [35188880](https://pubmed.ncbi.nlm.nih.gov/35188880/)]
33. He L, Pan X, Wang N, Yang J, Jiang J, Luo Y, et al. New types of drug use and risks of drug use among men who have sex with men: a cross-sectional study in Hangzhou, China. *BMC Infect Dis*. Apr 17, 2018;18(1):182. [FREE Full text] [doi: [10.1186/s12879-018-3091-z](https://doi.org/10.1186/s12879-018-3091-z)] [Medline: [29665785](https://pubmed.ncbi.nlm.nih.gov/29665785/)]
34. Zhu Z, Yan H, Wu S, Xu Y, Xu W, Liu L, et al. Trends in HIV prevalence and risk behaviours among men who have sex with men from 2013 to 2017 in Nanjing, China: a consecutive cross-sectional survey. *BMJ Open*. Jan 3, 2019;9(1):e021955. [FREE Full text] [doi: [10.1136/bmjopen-2018-021955](https://doi.org/10.1136/bmjopen-2018-021955)] [Medline: [30705234](https://pubmed.ncbi.nlm.nih.gov/30705234/)]
35. Zhu ZP, Zhang M, Xu YY, Xu WJ, Liu L, Wu SS, et al. [Cross-sectional surveys on the use of recreational drug nitrous-acid-ester rush-poppers in men who have sex with men, Nanjing] [Article in Chinese]. *Zhonghua Liu Xing Bing Xue Za Zhi*. Feb 15, 2017;38(2):189-193. [doi: [10.3760/cma.j.issn.0254-6450.2017.02.011](https://doi.org/10.3760/cma.j.issn.0254-6450.2017.02.011)] [Medline: [28231664](https://pubmed.ncbi.nlm.nih.gov/28231664/)]

36. Zhao T, Chen G, Sun C, Gong X, Li H, Fu G. The epidemic of HIV and syphilis and the correlation with substance abuse among men who have sex with men in China: a systematic review and meta-analysis. *Front Public Health*. Feb 17, 2023;11:1082637. [FREE Full text] [doi: [10.3389/fpubh.2023.1082637](https://doi.org/10.3389/fpubh.2023.1082637)] [Medline: [36875380](https://pubmed.ncbi.nlm.nih.gov/36875380/)]
37. Traeger MW, Guy R, Asselin J, Patel P, Carter A, Wright EJ, et al. Australian Collaboration for Coordinated Enhanced Sentinel Surveillance of Sexually Transmissible Infections and Blood Borne Viruses (ACCESS) Study Group. Real-world trends in incidence of bacterial sexually transmissible infections among gay and bisexual men using HIV pre-exposure prophylaxis (PrEP) in Australia following nationwide PrEP implementation: an analysis of sentinel surveillance data. *Lancet Infect Dis*. May 25, 2022;22(8):1231-1241. [doi: [10.1016/S1473-3099\(22\)00175-X](https://doi.org/10.1016/S1473-3099(22)00175-X)] [Medline: [35643090](https://pubmed.ncbi.nlm.nih.gov/35643090/)]
38. Hoenigl M, Jain S, Moore D, Collins D, Sun X, Anderson PL, et al. California Collaborative Treatment Group 595 Team. Substance use and adherence to HIV preexposure prophylaxis for men who have sex with men. *Emerg Infect Dis*. Dec 1, 2018;24(12):2292-2302. [FREE Full text] [doi: [10.3201/eid2412.180400](https://doi.org/10.3201/eid2412.180400)] [Medline: [30457536](https://pubmed.ncbi.nlm.nih.gov/30457536/)]

Abbreviations

aOR: adjusted odds ratio
MSM: men who have sex with men
PrEP: pre-exposure prophylaxis
PEP: postexposure prophylaxis
STIs: sexually transmitted infections

Edited by A Mavragani; submitted 20.09.24; peer-reviewed by S Luo, E Miyagi; comments to author 29.11.24; revised version received 29.12.24; accepted 09.01.25; published 13.02.25

Please cite as:

He L, Jiang S, Jiang T, Chen W, Zheng J, Wang H, Chai C

A Comparison of Mobile Social Media Promotion and Volunteer-Driven Strategies for Community Organizations Recruiting Men Who Have Sex with Men for HIV Testing in Zhejiang Province, China: Cross-Sectional Study Based on a Large-Scale Survey
J Med Internet Res 2025;27:e66702

URL: <https://www.jmir.org/2025/1/e66702>

doi: [10.2196/66702](https://doi.org/10.2196/66702)

PMID:

©Lin He, Shaoqiang Jiang, Tingting Jiang, Wanjun Chen, Jinlei Zheng, Hui Wang, Chengliang Chai. Originally published in the *Journal of Medical Internet Research* (<https://www.jmir.org>), 13.02.2025. This is an open-access article distributed under the terms of the Creative Commons Attribution License (<https://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work, first published in the *Journal of Medical Internet Research* (ISSN 1438-8871), is properly cited. The complete bibliographic information, a link to the original publication on <https://www.jmir.org/>, as well as this copyright and license information must be included.