Acceptability of Using Geosocial Networking Applications for HIV/Sexually Transmitted Disease Partner Notification and Sexual Health Services

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Abstract

Background: Geosocial networking (GSN) app use among men who have sex with men (MSM) has presented new opportunities for increasing the reach and efficiency of sexual health interventions but also poses challenges to HIV/sexually transmitted disease partner notification. Understanding MSM's attitudes toward app-based preventive sexual health services can help inform their development and delivery.

Methods: We recruited US MSM who had met a sex partner on GSN apps in the last year to participate in an online survey assessing acceptability and preferences regarding app-based partner notification, health department presence, and sexual health services. Three app-based notification strategies were presented: sending notification messages through participant's/partner's app profile, health department app profile, or in-app anonymous messaging.

Results: Of 791 respondents, a majority (70%) preferred to be notified by their partner directly; however, most would get tested if notified by health department profile (95%) or anonymous in-app message (85%). Given the options provided, 50% preferred notifying a partner using their own profile, 26% with health department assistance, and 24% via in-app anonymous message. A majority (71%) were comfortable notifying a partner through a health department profile, and 74% were comfortable using in-app anonymous messaging. Most participants (82%) were comfortable with health departments having app profiles to provide sexual health services.

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Conclusions: Our results suggest that GSN app–based partner notification and sexual health services would be used by and are acceptable to US MSM. Partnering with app companies to integrate these services and increase access to public health programs has potential to improve MSM sexual health.

Gay, bisexual, and other men who have sex with men (MSM) bear the heaviest burden of HIV and other sexually transmitted diseases (STDs) in the United States.[1,2] The introduction and normalization of geosocial networking (GSN) smartphone apps over the last decade have changed how MSM meet sex and romantic partners[3–8] with potential implications for HIV/STD risk and prevention. GSN apps often provide users with tools to share sexual health preferences and HIV status with partners and have potential to reach MSM where they are with preventive sexual health services.[9] Services may be delivered directly within apps or through linkages to external programs and provided by apps, sexual health programs, or health departments.[10–16] Understanding MSM preferences can inform effective delivery of GSN app–based HIV/STD prevention strategies.

GSN app use also poses challenges for partner services (PS), a core public health strategy for preventing HIV/STD transmission in which specially trained health program staff assist individuals newly diagnosed as having HIV or an STD in confidentially notifying their sex partners of possible exposure.[17] First, MSM may choose not to exchange contact information with partners met through the apps, limiting their own and health departments' ability to notify partners of HIV/STD exposure through standard notification methods.[18] Second, GSN apps pose unique partner tracing challenges because users often do not have stable profiles or unique profile names, messages with other users are stored for a limited time, users sometimes delete their profiles or block other users, and profiles are generally only visible if users are within geographic proximity. Although standard practice has been to notify partners in person or by telephone, health departments have adapted PS delivery to include notification through e-mail, instant messaging, social networking websites, and dating/sex-seeking websites.[19–21] Health departments and dating/sex-seeking website users previously reported supporting health department–initiated partner notification through the sites, but only a minority of website owners reported being willing to implement the intervention.[22] Currently, apps' policies regarding health department partner notification or presence vary, with some explicitly allowing or banning it and some leaving its allowability uncertain. A lack of data regarding acceptability of app-based partner notification among app users and the extent to which the apps present barriers to standard notification methods have hindered the development of clear policies and full-scale implementation.

Several studies have found GSN app–based HIV/STD prevention features to be acceptable to US MSM, including the following: receipt of sexual health information including awareness about increases in STD rates and access to increased testing during outbreaks,[12,14,15,22] and links to HIV/STD testing center locations, HIV self-tests, and LGBTQ-friendly providers.[12,13] In addition, many GSN apps offer users options to share HIV status, last HIV test date, and sexual safety practices on their profiles, and some have begun to offer testing reminders. However, these interventions and features have generally been studied independently of each other. A more comprehensive examination of which services would be preferred and used by MSM and how health departments can present

themselves on GSN apps when providing services can guide health departments and app companies when prioritizing, developing, and implementing health-related features.

This cross-sectional, national online survey of US MSM investigated the acceptability of and preferences regarding HIV/STD partner notification, health department presence, and preventive sexual health services on GSN apps. It was conducted as part of a broader effort by Building Healthy Online Communities, a consortium of HIV/STD prevention organizations working with MSM dating/sex-seeking website and app owners, to inform development of interventions that have support from users, owners, and public health.

MATERIALS AND METHODS

Study Design and Subjects

We conducted an online survey of US MSM who use GSN apps to meet partners from August to October 2017. Study participants were recruited through banner advertisements on Facebook, Instagram, and Snapchat. Potential participants clicked on the advertisement and were brought to a brief eligibility screening survey in SurveyGizmo. Eligibility criteria included the following: male aged 18 years, US residence, and having met a male sex partner through a GSN app in the last 12 months. Eligible participants completed the online survey and were given the option to enter a raffle to win a $100 Amazon gift certificate. To investigate whether acceptability differed by race/ethnicity, we aimed to recruit 400 non-Hispanic white MSM and 400 MSM of color.

The study received ethical approval from the University of Washington Human Subjects Division. All participants provided informed consent.

Measures

The survey included 6 sections: demographics, HIV/STD testing, use of GSN apps, partner notification on GSN apps, preventive sexual health services on GSN apps, and substance use and sexual behavior. Demographic, HIV/STD testing, substance use, and sexual behavior questions were based on the American Men's Internet Survey, an annual web-based behavioral survey of US MSM.[23] Questions regarding GSN app use and partner notification and preventive sexual health services on GSN apps were informed by previous qualitative research among US MSM.[24] We conducted online cognitive interviews with 13 US MSM to improve the clarity of the health services questions and partner notification hypothetical scenarios and questions.

Acceptability of and Preferences Regarding GSN App–Based Partner Notification

We assessed acceptability of HIV/STD partner notification using GSN apps through respondents' rating and ranking of notification methods in 2 hypothetical scenarios (Fig. 1). Methods using GSN apps included the following: sending messages through the participant's/partner's app profile, a health department app profile, or a hypothetical anonymous messaging system built into the app. Participants were asked to rate their comfort level with each method and rank them in order of preference from most to least "like to use." Measuring both comfort and ranking enables better prioritization of strategies.

Measuring comfort alone would not indicate which method was preferred if comfort is comparable across methods; ranking alone would not indicate whether any of the methods were comfortable. In addition to the scenarios, respondents were asked if they would like apps to provide an example notification message to help them word their own messages to partners. Participants were asked about the likelihood they would test for syphilis if notified by a health department profile or anonymous message in an app.

Ability to Recontact Partners Met on GSN Apps

To successfully notify partners, partner contact information must be known. To assess the ability of MSM or health departments to reach partners, we included questions about the type(s) of contact information participants exchanged with partners met on apps, the number of partners participants thought they would be able to contact again if they tried, the number of partners blocked on apps, whether/how they tracked partners they met on apps, and whether/why they deleted an app profile in the last year. We collapsed participant responses about contact information into 3 categories. We defined "always contactable" as the participant or partner(s) always having 1 of the following: telephone number, e-mail address, home address, work address, or social media profile name; "sometimes contactable" as sometimes having 1 of these pieces of information; and "never contactable" as never having any of these.

Preventive Sexual Health Services and Health Department Presence on GSN Apps

Respondents were asked what preventive sexual health services they would use if offered in GSN apps. To address acceptability of health department presence on apps, we asked participants to rate their comfort with health departments having profiles on apps for providing information and services, what features of a department profile would make them more likely to think that it was real, and how having health department profiles on an app would affect their likelihood of using the app.

Statistical Analyses

We used respondent IP addresses to identify multiple submissions from the same participant, guided by methods from Grey et al.[25] Duplicates were identified based on full IP addresses, and only the first completed submission was retained. Surveys completed in less than half the median completion time were flagged as questionable and evaluated manually for implausible responses.

We conducted descriptive analyses of comfort and preference with partner notification methods from the hypothetical scenarios and calculated mean ranks for each method. We investigated whether comfort with each method was associated with race/ethnicity and age using bivariable log-binomial generalized linear models. Age was analyzed as continuous. We categorized comfort as somewhat/very comfortable versus somewhat/very uncomfortable. We calculated the proportion of participants who ranked each method as the one they would most like to use or would most like for a partner to use (i.e., rank = 1). We compared intentions to test for syphilis after being notified by a health department profile versus in-app anonymous message using the McNemar test. We used χ^2 tests to compare prevalences of having ever sent or received a partner notification message in an app by HIV

status and history of bacterial STD and to compare likelihoods of using app-based health services by HIV status. We conducted analyses using Stata 13.0 (College Station, TX).

RESULTS

Study Population

Of 1410 men who met the eligibility criteria on the screening questionnaire, 791 (56%) completed the survey. Respondents with completed surveys had a median age of 28 years (interquartile range, 21–45 years), 53% were non-Hispanic white, 15% reported being HIV positive, and 27% had ever been diagnosed as having a bacterial STD (Table 1). Participants reported a median of 5 male sex partners in the last year, an average of 79% of whom were met on GSN apps. Among eligible men, survey completion was associated with being non-Hispanic white ($P < 0.001$) but not with age ($P = 0.89$) or US region ($P = 0.42$).

Experiences With App-Based Partner Notification

Overall, 7% of participants reported only ever receiving, 7% reported only ever sending, and 4% reported both sending and receiving a partner notification message in an app. HIV-positive participants with a history of bacterial STD were the most likely to report both having sent (41%) and received (22%) a partner notification message in an app, followed by HIV-negative participants with history of STDs (23% sent, 18% received), HIV-positive participants with no STD history (21%, 11%), and those with no HIV/STD history (3%, 7%; $P < 0.001$ for all comparisons). Among respondents who had received a partner notification message in an app, 80% received a message from a partner and 20% from health department staff.

Acceptability of and Preferences Regarding GSN App–Based Partner Notification

Table 2 presents participants' comfort with and preferences regarding how they would like to be notified of a sex partner's syphilis diagnosis and to notify a partner if they were diagnosed. Most participants reported that they would be very/somewhat comfortable being notified directly by a partner using his own profile (77%) and would most like their partner to use this method (70%). Comfort with and preference for being notified by a health specialist using a health department profile (57% and 20%, respectively) and by anonymous message in the app (41%, 10%) were substantially lower. Participants reported that they would be more likely to test for syphilis in response to a notification message from a health department app profile than an in-app anonymous notification message (95% vs. 85%, respectively; $P < 0.001$).

By contrast, a majority of participants (65%–74%) reported that they would be comfortable notifying partners using all methods except for collaborating with a health specialist using the participant's app profile to send a message (49%). Although 50% most preferred to notify a partner using their own profile, 26% preferred health department assistance and 24% an in-app anonymous messaging system.

Compared with non-Hispanic white participants, non-Hispanic black participants were 15% less likely (relative risk, 0.85; 95% confidence interval, 0.74–0.97) and Hispanic

participants were 21% less likely (relative risk, 0.79; 95% confidence interval, 0.71–0.88) to be comfortable being told directly by a partner in the app that he had been diagnosed as having syphilis. Race/ethnicity was not associated with participants' comfort with any other method of being notified by or notifying partners ($P > 0.05$ for all). Older participants were significantly more likely than younger participants to be comfortable with all methods of being notified by and notifying partners ($P < 0.05$ for all), except for collaborating with a health specialist using the participant's app profile to send a message ($P = 0.876$).

In addition, 79% of participants reported that they would like apps to provide users with an example partner notification message to help with wording if they were using their own profile. If apps provided users with a way to notify partners of HIV/STD exposure, 63% would use the system, and 46% would be more and 47% as likely to use the app.

Ability to Recontact Partners Met on GSN Apps

Of sex partners met on GSN apps, participants reported having sex more than once with 49%, being able to contact 68% again, and blocking 15% on average (Table 3). Based on how often respondents reported providing specific contact information to partners met on apps, 46% of participants would always, 50% sometimes, and 4% never be able to be contacted by these partners outside the app. Based on how often respondents reported receiving specific contact information from partners met on apps, 45% of participants would always, 51% sometimes, and 4% never be able to contact these partners outside the app. A majority (73%) reported keeping track of men in apps they might want to chat with again, and 57% had deleted their profile on an app in the last year.

Preventive Sexual Health Services and Health Department Presence on GSN Apps

Figure 2 presents the preventive sexual health services that participants would use if offered in GSN apps stratified by HIV status. Most participants (82%) were comfortable with apps allowing health department profiles to provide users with these services and information. Race/ethnicity and age were not associated with participants' comfort with health department presence on apps ($P = 0.270$ and 0.700, respectively). If health departments had profiles on GSN apps, 51% of participants would be more likely, 46% as likely, and 3% less likely to use the app. Participants would be more likely to think a health department profile on an app was real if contact information for health department staff was provided (75%), the profile was verified by the app as being real (67%), and the profile picture included an official health department logo (53%).

DISCUSSION

In a diverse online sample of US MSM, we found that hypothetical GSN app–based HIV/STD partner notification and preventive sexual health services offered by health departments or built into these apps would generally be acceptable. Although most participants would prefer to be notified directly by a partner, half would prefer to notify a partner through a health department profile or anonymous in-app message. A majority of MSM reported interest in using a variety of app-based preventive sexual health services;

HIV-negative/unknown status men generally reported greater interest than did HIV-positive men.

Although half of our participants would prefer to notify partners of HIV/STD exposure directly, half preferred to notify partners using health department assistance or anonymous message via the app. This may, in part, reflect differences in the types of participants' partners. Our recent qualitative work found that how men wanted to notify partners depended on the closeness of their relationship with the partner.[24] Although MSM would generally prefer to notify regular partners on their own, some MSM liked the idea of notifying casual or hard-to-reach partners using anonymous in-app messaging or health department profiles. Similarly, an Australian study found that MSM preferred anonymous notification methods for casual partners who were predominantly met online or through apps.[26] Promisingly, 70% of users of an Australian Internet-based service that allows individuals to send anonymous or personal partner notification text messages reported that they were more likely to contact a partner because of the website.[27] However, most MSM in our study reported wanting their partner to notify them directly if the partner was diagnosed as having HIV or an STD. Encouragingly, though, most reported that they would still get tested if notified through a health department profile or anonymous in-app message, which is consistent with the findings from our qualitative study of app-based notification and a similar study of inSPOT, a partner notification website that allows individuals to send anonymous electronic partner notification e-mail cards.[24,28] Together, these results highlight the need to provide multiple options for partner notification. Notification strategies may need to be tailored by partner type, and offering app-based anonymous notification may encourage individuals to notify partners when they may not have otherwise.

Approximately half of participants reported always receiving enough contact information from partners met through apps for health department staff to be able to contact them using traditional methods, and on average, participants reported that they could find approximately two-thirds of their partners again if they needed to. Even if participants do not have contact information for partners met through apps, results from our qualitative study suggested that partners are generally easy to find again on the apps unless partners block them, delete their profiles, or change usernames. Although finding a partner met through an app may pose less of a barrier to PS than expected, blocking and deleting profiles still hinder partner tracing. More than half of participants had deleted an app profile in the last year, and participants blocked 15% of partners on apps on average. Similarly, a study in Australia found that MSM often blocked partners on apps and/or deleted contact information soon after sexual contact.[26] App-based notification methods may enhance the ability of app users and health departments to trace partners, but blocking and profile deletion may remain challenges.

Most participants in our study reported being comfortable with a health department presence on GSN apps to offer sexual health information and preventive services, consistent with other studies that have found that GSN apps are an acceptable place for provision of various preventive sexual health services.[10–15] Consistent with another study of US MSM,[13] we found that HIV-positive MSM were significantly less likely than HIV-negative MSM to be interested in using health-related app features. Despite these differences, most participants overall reported that they would use in-app HIV/STD prevention features.

This study had several limitations. First, we asked about partner notification methods and app-based health service use hypothetically, which may overestimate or underestimate their use in reality.[29,30] Second, although we previously found that acceptability of app-based partner notification strategies may depend on partner or infection type,[24] we were unable to assess partner/infection-specific acceptability and preferences. Third, MSM participating in our survey may not be representative of all US MSM with respect to their views on app-based partner notification or preventive sexual health services. For example, although we recruited a racially/ethnically diverse study sample, the survey was only conducted in English, which excludes the views of non–English-speaking MSM. Fourth, although we used respondent IP addresses to identify multiple submissions from the same participant, this does not eliminate the possibility of fraudulent responses.

Integrating HIV/STD prevention efforts into apps widely used by MSM has the potential to increase their reach and efficiency. Ongoing collaboration between public health and app owners as well as user engagement will be vital to the successful implementation of app-based partner notification and other preventive sexual health services. The high level of acceptability identified by MSM in our sample supports the development of GSN app–based HIV/STD prevention services, including partner notification. As these services are developed and implemented, studies will be necessary to evaluate their uptake, acceptability, and effectiveness in practice.

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Scenario 1: *Imagine that you recently had anal sex without a condom with a guy you met on a dating/hookup app. It has been a few weeks since you had sex with him, and he just found out he has syphilis. He wants to tell you so that you can get tested and, if necessary, treated. You only chatted in the app, and he doesn't have any other contact information he can use to reach you.* *In the next three questions, rate how comfortable you would be with the following ways he could tell you that he may have exposed you to syphilis:*	
Method A: **He sends you a message** in the app to let you know that he may have exposed you to syphilis and to encourage you to get tested.	☐Very comfortable ☐Somewhat comfortable ☐Somewhat uncomfortable ☐Very uncomfortable
Method B: The local health department has a profile on the app. You **receive a message from a health department profile** in the app from a health specialist. The health specialist tells you that you may have been exposed to syphilis and provides you with information on where you can get tested and treated. The health specialist does not tell you who exposed you.	☐Very comfortable ☐Somewhat comfortable ☐Somewhat uncomfortable ☐Very uncomfortable
Method C: You **receive an anonymous message from within the app** telling you that you may have been exposed to syphilis by another app user. The message states "one of your sex partners is concerned that they may have exposed you to syphilis and wanted to let you know so you can take care of yourself by getting tested and, if necessary, treated." You do not know who exposed you.	☐Very comfortable ☐Somewhat comfortable ☐Somewhat uncomfortable ☐Very uncomfortable
Please rank the ways described in the previous three questions that this partner could tell you about your possible exposure to syphilis from the one you would most like for him to use (1) to the one you would least like for him to use (3).	____ Method A: He tells you using his app profile ____ Method B: Health specialist tells you using health department profile ____ Method C: You receive an anonymous message in the app
Scenario 2: *Imagine that you were just diagnosed with syphilis at an STD clinic. A few weeks ago, you had anal sex without a condom with a guy you met on a dating/hookup app. You only talked to him in the app and do not have any other contact information for him. A health specialist from your local health department contacts you to tell you that he or she can help you tell your sex partners that they may have been exposed to syphilis.* *In the next five questions, rate how comfortable you would be with the following ways of telling this partner that he may have been exposed to syphilis:*	
Method 1: You find an old message from the partner in the app and send him a message using **your app profile**. You tell him that you just found out you have syphilis and let him know that he may want to get tested.	☐Very comfortable ☐Somewhat comfortable ☐Somewhat uncomfortable ☐Very uncomfortable
Method 2: You meet with the health specialist from your local health department. During the meeting, you hand the health specialist your phone and allow him/her to send the partner a message from the health department using **your app profile.** The message lets him know that he may have been exposed to syphilis and may want to get tested.	☐Very comfortable ☐Somewhat comfortable ☐Somewhat uncomfortable ☐Very uncomfortable
Method 3: You meet with the health specialist from your health department. The health specialist has a **health department profile** on the app that he/she can use to find the partner on the app to let him know that he may have been exposed to syphilis and to help him get tested. The health specialist won't provide any information about you.	☐Very comfortable ☐Somewhat comfortable ☐Somewhat uncomfortable ☐Very uncomfortable
Method 4: The app allows you to send anonymous, pre-written partner notification messages to any user. You find the partner in the app on your own and send him an anonymous, pre-written partner notification message to tell him that he may have been exposed to syphilis and may want to get tested.	☐Very comfortable ☐Somewhat comfortable ☐Somewhat uncomfortable ☐Very uncomfortable
Method 5: The app has a function that provides you with a list of guys you have chatted with on the app in the last 12 months, even if you have deleted or lost their messages. You select the partner from that list, which sends him an anonymous, pre-written message in the app that tells him that he may have been exposed to syphilis and may want to get tested.	☐Very comfortable ☐Somewhat comfortable ☐Somewhat uncomfortable ☐Very uncomfortable
Please rank the ways described in the previous five questions that you could tell this partner about his possible exposure to syphilis from the one you would most like to use (1) to the one you would least like to use (5).	____ Method 1: You tell the partner by sending a message through **your** profile ____ Method 2: Health specialist tells the partner by sending a message through the app using **your** profile ____ Method 3: Health specialist tells the partner by sending a message through the app using the **health department** profile ____ Method 4: Send an anonymous, pre-written message to the partner by finding the partner in the app on your own ____ Method 5: Send an anonymous, pre-written message to the partner
	using the list provided to you by the app

Figure 1.
Hypothetical scenarios and partner notification methods.
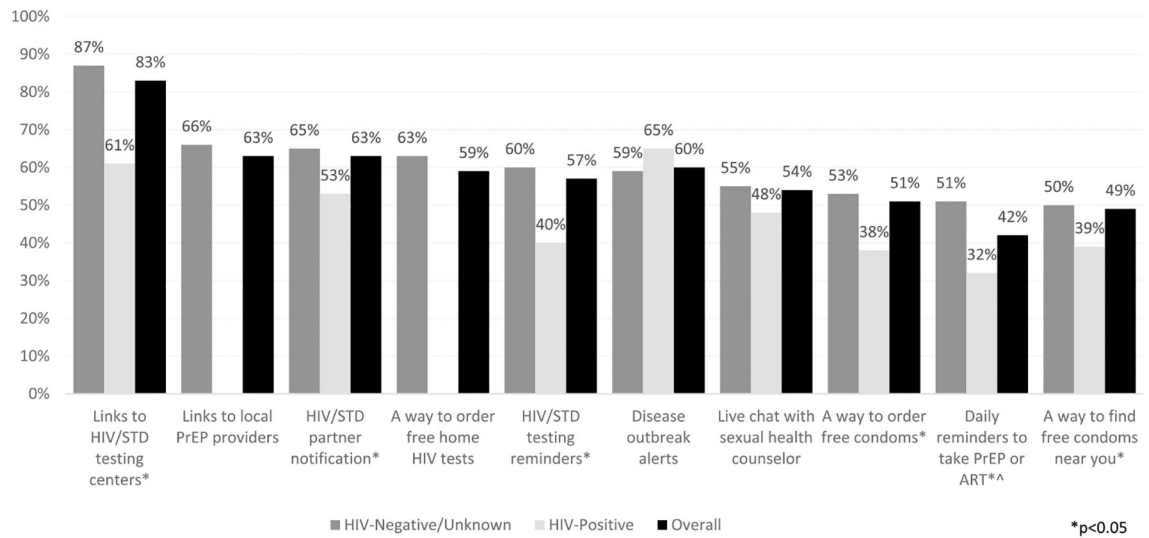
^ Only among those who reported currently taking PrEP or ART
PrEP, pre-exposure prophylaxis; ART, antiretroviral therapy

Figure 2.
Percentage of participants who would use various preventive sexual health services if offered in geosocial networking apps, by HIV status.

TABLE 1.

Characteristics of Survey Respondents[*]

	Respondents (N = 791)
Demographic factors	
Age, median (IQR)	28 (21–45)
Race	
Non-Hispanic white	407 (53)
Non-Hispanic black	96 (13)
Hispanic	211 (28)
Other	45 (6)
US Census region	
Northeast	120 (15)
Midwest	149 (19)
South	313 (40)
West	209 (26)
Highest education level	
Less than college	142 (18)
Some college/2-y degree	295 (37)
4-y degree	188 (24)
>4-y degree	165 (21)
Relationship status	
Single	498 (64)
Boyfriend/partner/spouse	264 (34)
Triad	19 (2)
HIV/STD testing	
Ever tested for HIV	670 (85)
HIV tests in last 2 y[†], median (IQR)	2 (1–4)
HIV status[†]	
Negative	561 (83)
Positive	100 (15)
Do not know	11 (2)
Ever diagnosed as having chlamydia, gonorrhea, or syphilis	210 (27)
Substance use and sexual behavior, last 12 mo	
Injected drugs	25 (3)
Used meth	21 (3)
Used poppers	253 (32)
Received money for sex	57 (7)
Paid money for sex	53 (7)
No. sex partners in the last year, median (IQR)	5 (3–12)
No. sex partners sex without a condom in last year, median (IQR)	2 (0–3)
Use of geosocial networking apps, last 12 mo	
Apps used	

	Respondents (N = 791)
Grindr	659 (83)
Scruff	295 (37)
Tinder	289 (37)
Adam 4 Adam RADAR	192 (24)
Jack'd	184 (23)
GROWLr	130 (16)
Hornet	118 (15)
Daddyhunt	72 (9)
Mr. X	18 (2)
GuySpy	17 (2)
Looking for	
Sex/hookups	682 (86)
Dates	427 (54)
Killing time	421 (53)
Friends	400 (51)
Relationship	397 (50)
Networking	158 (20)
Gym buddies	65 (8)

Values are presented as n (%) unless otherwise indicated.

*
Observations were excluded if participants preferred not to answer a question.

†Among those who had ever had an HIV test.

IQR indicates interquartile range.

TABLE 2.

Acceptability of App-Based Partner Notification Methods Among 791 US MSM Who Met Sex Partners Using Geosocial Networking Apps

Methods of Being Notified by a Partner Diagnosed as Having Syphilis	Comfortable With	Would Most Like for Partner to Use	Mean Rank (SD) [*]
Method A: He tells you using his app profile	77%	70%	1.4 (0.7)
Method B: Health specialist tells you using health department profile	57%	20%	2.0 (0.6)
Method C: You receive an anonymous message in the app	41%	10%	2.6 (0.7)

Methods of Notifying a Partner If You Were Diagnosed as Having Syphilis	Comfortable With	Would Most Like to Use	Mean Rank (SD) [†]
Method 1: You tell the partner by sending a message through your app profile	65%	50%	2.4 (1.6)
Method 2: Health specialist tells the partner by sending a message through the app using your profile	49%	8%	3.4 (1.3)
Method 3: Health specialist tells the partner by sending a message through the app using the health department profile	71%	18%	2.7 (1.2)
Method 4: Send an anonymous, pre-written message to the partner by finding the partner in the app on your own	68%	6%	3.2 (1.2)
Method 5: Send an anonymous, pre-written message to the partner using the list provided to you by the app	74%	18%	3.3 (1.5)

[*]
From most like for partner to use (1) to least like for partner to use (3).

[†]
From most like to use (1) to least like to use (5).

MSM indicates men who have sex with men; SD, standard deviation.

TABLE 3.

Reported Ability to Recontact Partners Met on GSN Apps in the Last 12 Months

	Respondents (N = 791)
Partners met through GSN apps	
No. sex partners met through GSN apps, median (IQR)	4 (2–10)
Proportion of male sex partners met on GSN apps, mean (SD)	0.79 (0.26)
Of male sex partners met on GSN apps, mean (SD) proportion of partners that respondents	
Had sex with more than once	0.49 (0.35)
Would be able to contact again if tried today	0.68 (0.34)
Blocked on the app	0.15 (0.28)
Contact information given to partners met on GSN apps	
Ability to be contacted by partner [*]	
Always contactable	365 (46)
Sometimes contactable	398 (50)
Never contactable	28 (4)
Always give	
First and last name	219 (28)
Telephone number	266 (34)
E-mail address	84 (11)
Home address	148 (19)
Where you work	113 (14)
Social media handle/profile name	173 (22)
Never give	
First and last name	64 (8)
Telephone number	101 (13)
E-mail address	642 (69)
Home address	320 (41)
Where you work	391 (50)
Social media handle/profile name	282 (36)
Contact information received from partners met on GSN apps	
Ability to contact a partner [*]	

	Respondents (N = 791)
Always contactable	358 (45)
Sometimes contactable	402 (51)
Never contactable	31 (4)
Always receive	
First and last name	211 (27)
Telephone number	288 (36)
E-mail address	83 (10)
Home address	140 (18)
Where you work	135 (17)
Social media handle/profile name	177 (22)
Never receive	
First and last name	34 (4)
Telephone number	76 (10)
E-mail address	512 (65)
Home address	231 (29)
Where you work	296 (38)
Social media handle/profile name	246 (31)
Facilitators and barriers to finding men on GSN apps	
Keep track of men in the app	556 (73)
How they keep track[†]	
Save other contact information	356 (64)
"Favorite" in the app	347 (62)
Save chats in the app	311 (56)
Take screenshots of profiles	127 (23)
Save usernames	117 (21)
Other	21 (4)
Deleted app profile	443 (57)
Why they deleted their profile[‡]	
Tired of using the app	260 (59)
No longer looking for other partners	191 (43)
Did not want other people to see them on the app	131 (30)

	Respondents (N = 791)
Did not want former sex partner to be able to contact them	53 (12)
Other	42 (9)

Values are presented as n (%) unless otherwise indicated.

*
Contactable is defined as having at least one of the following pieces of information: telephone number, e-mail address, home address, work address, or social media profile name.

†
Among those who keep track of men in the app.

‡
Among those who deleted their profile.

GSN indicates geosocial networking; IQR, interquartile range.