A Review of Social Media Technologies Across the Global HIV Care Continuum

Renee Garrett, MS, LCSW¹, Justin Smith, MS²,³, and Sean D. Young, PhD, MS²,³
¹ElevateU, Los Angeles, CA, USA
²University of California Institute for Prediction Technology, Department of Family Medicine, University of California, Los Angeles, Los Angeles, CA, USA
³UCLA Center for Digital Behavior, Department of Family Medicine, University of California, Los Angeles, Los Angeles, CA, USA

Abstract

HIV remains one of the main health global threats of the 21st century. There is a great need to reach HIV at-risk and HIV+ populations across the HIV care continuum to improve HIV prevention, testing, and treatment. New technologies, such as Social Media (SM) and Social Networking Sites (SNS) have shown early promise in HIV research studies. To assess the state of research on the use of SM/SNSs across the HIV continuum, we conducted a systematic literature review on HIV-related research using SM during the last 10 years. A total of 44 papers were identified, of which 17 (38.6%) were classified as intervention studies and 19 (61.3%) as observational. The focus areas of the studies was evenly distributed between outreach/recruitment (n=15, 34.1%), surveillance/observation (n=13, 29.5%) and prevention/treatment (n=16, 36.4%). Researchers engaged the community through Facebook (n=26, 59.1%), multiple-platforms (n=13, 29.5%), or one of several geo-social networking sites (n=10, 22.7%). Studies primarily targeted MSM (n=24, 54.5%) and youth (n=13, 29.5%) with little research focused on HIV+ populations (n=5, 11.4%). The current state of the field, trends, and limitations of this work are discussed.

INTRODUCTION

Well into its fourth decade, the HIV epidemic remains a major global public health challenge. To date, HIV has impacted more than 78 million people [1]. In 2013, it was estimated that 2.1 million people were newly infected with HIV [2], and 35 million people were living with HIV worldwide [3]. Many countries are now struggling with concentrated HIV epidemics among several subpopulations. Some of the most affected sub-populations...
include men who have sex with men (MSM), male and female sex workers, injecting drug users, youth (aged 15–24), and women [4–8].

One of the key barriers in HIV prevention, treatment, care, and support is HIV-related stigma [9–13]. HIV related stigma is characterized by negative attitudes and behaviors that discourage people from accessing HIV-related information and services. This leads to individuals who are unaware of their HIV status, not in treatment, and continuing to engage in high-risk behaviors that sustain the epidemic. This is particularly salient among the subpopulations at high-risk of HIV as they are often ostracized by society [14–17]. For example, homosexuality remains criminalized in many countries, and public health programs often have difficulties reaching MSM under homophobia and HIV-related stigma and discrimination. One method to increase the chance of success for an intervention is to adapt and modify the intervention to meet the local environment [18,19]. Innovative strategies and technologies that can bypass traditional social structures to reach populations at high-risk of HIV are also needed.

**Social Media and Public Health**

Social media (SM)/Social Networking Sites (SNS) use has increased tremendously in the past decade, and these technologies have emerged as potential platforms to access hard-to-reach populations [20, 21, 22*, 23*]. Social media refers to social networking sites that offer different functionalities, such as private messaging and multimedia content sharing among many others [24]. SM is characterized by its user-generated content and many-to-many communication style. Users create a profile that often includes a list of identifying information, such as their personal names, photographs, birthday, religion, political views, and hobbies. Unlike traditional websites, users can then create and share information and multimedia content with their friends or be connected with others with similar background and interests.

SM use is extremely popular, with an estimated that 73% and 80% of the US adult and teen internet users using some form of SM [25,26]. Additionally, a recent trend shift has occurred such that many emerging countries have a greater percentage of SM users compared to developed countries [27]. Facebook is the most popular SNS worldwide, with approximately 968 million computer users and 844 million mobile users [28]. With the popularity and the convenience of accessing social media, these sites offer the potential for public health to reach a large number of individuals at-risk of and living with HIV/AIDS.

A number of public health researchers and practitioners have started exploring the potential of using online social networks and online communities to deliver health information and services [29–31]. An important discovery from this work is that SM is especially suited for disseminating information on sensitive topics (e.g., sexual risk) and stigmatized diseases such as HIV/AIDS. The freedom to access information and services at any time/location, along with a degree of anonymity, allows some of the stigma and discrimination associated with the disease to be avoided. However, there is some concern that a preference still exists to obtain sexual health information in-person with a doctor or from a website, vs. from SM [32*]. In addition, social influence is a primary facilitator in behavioral change, and researchers have been able to use SM to establish online communities rapidly and facilitate
communication about sexual health and HIV prevention behavior with high-risk populations.

The potential implications of using SM in combating the global HIV pandemic are tremendous, especially given the ability for SM to address the global HIV care continuum (prevention, testing, care, adherence, retention, and treatment) [33]. However, to date, only a small number of studies have examined the cross section between online social networks and HIV. Therefore, in this paper, we seek to review the current state of how SM has been used to improve the global HIV care continuum.

METHODS

Selection Criteria and Data

We searched PubMed, PsycInfo, and Google Scholar with the following combination of keywords: HIV, AIDS, social media, and social networking sites. Due to the large number of results, we reviewed the first 500 listed articles in the 10 years leading up to July 1, 2015. For this review, SM-based HIV research was defined as studies that explore how to use SM/SNS as the primary or sole medium to deliver HIV-related intervention content. We included studies that utilized existing SNSs (e.g. Facebook, Twitter, and YouTube) and studies that created their own websites with social networking components. We excluded text-based studies and Internet-delivered or smart phone-based studies that did not have any social networking features.

Inclusion criteria for this review included studies that:

1. Reported progress, pilot/feasibility testing, or randomized controlled trials (RCT) results for HIV-related programs across the HIV continuum.
2. Published in peer-reviewed journals.
3. Published in previous 10 years.
4. Published in English.

Because of the breadth of the types of studies conducted, papers were broken down according to two different frameworks. One method broke studies down by three different types of HIV-related research: studies on recruitment/outreach, prevention/treatment, or surveillance/observation. Recruitment/outreach studies either investigated the feasibility of using SM or SNSs to recruit target populations or actually recruited participants using SM or SNSs. Prevention/treatment studies investigated methods to encourage and promote safer sex/HIV prevention behavior or different methods of care for HIV+ populations. Surveillance/observational studies reported HIV rates, sexual risk behaviors, or substance use among participants recruited from social media. Studies were able to be classified as more than one topic, if applicable.

The second classification method distinguished between intervention and nonintervention (i.e. observational) studies. An intervention was defined as one of the above papers that introduced some form of online treatment on a subject group over a period of time. After a paper was identified as an intervention, it was then categorized according to the components...
used in the intervention itself. The following is a list of the 10 different types of interventions in the literature:

1. **Peer-leader** - interventions that utilized peer leaders to disseminate information.
2. **Informational posts** - study teams update and post information/messages to SM profiles periodically.
3. **Blog-Based** - interventions that deliver information through a blog format website.
4. **Webisodes** - study teams develop a series of informational videos and distribute them online.
5. **Partner notification** - study teams contact sexual partners of individuals who have tested HIV positive via SM.
6. **Live chat** - study teams communicate with participants solely using chat/message function on SNSs.
7. **Expert-led** - medical experts created SM profiles to engage participants.
8. **Passive recruitment** - study staff creates SM profile for a health worker and leaves it up to the users to initiate contact.
9. **Online Support group** - researchers create SM support groups for participants.
10. **Forum Based** - experts create an online forum where users of SM can access health and sex information.

**RESULTS**

After reviewing the articles and classifying the papers, the following information was extracted for all papers (Table 1):

1) Title
2) First Author/Publication Year
3) Platform(s) used in the study (ex: Facebook, Myspace, or Twitter)
4) Location
5) Target population
6) Number of participants
7) Focus of the research (e.g., recruitment/outreach, prevention, prediction, and surveillance))

A total of 44 unique studies met inclusion criteria and were reviewed. Based on the first classification method on the type of HIV research, the papers were classified as follows: outreach/recruitment (n=15, 34.1%), prevention/treatment (n=16, 36.4%), and surveillance/observation (n=13, 29.5%). All studies were published between 2011 and 2015, with the majority (n=23, 52.3%) being published in 2014/15. Most studies took place in developed countries, particularly in North America and Europe (n=34, 77.3%).
Looking at the use of SM platforms throughout both tables 1 and 2, 26 studies (59.1%) used Facebook, 3 (6.8%) used MySpace, 10 (22.7%) used geo-social networking sites (GSN), and 13 (29.5%) used several different platforms. From 2011 to 2014, there was a steady increase in the number of studies that were based on Facebook. The most common populations were MSM (n=24, 54.5%) and youth (n=13, 29.5%).

The second framework used in the paper was to classify papers as either intervention or nonintervention (Table 2). For intervention papers, we added the following columns of information:

8) Type of Intervention – One of the 10 types of interventions discussed above.
9) Length of Study – The period of time subjects were observed.
10) If there was a control group–If the study utilized a comparison group.

Out of the 44 papers, a total of 17 were classified as intervention studies. Peer leader based (n=5, 29.1%) and informational posts (n=4, 23.5%) were the most popular forms of intervention. The other eight types of interventions were only witnessed once each. The average length of a study was 7–8 months with 9 studies being 6 months or less (53%). Finally, 9 (52.9%) of the studies did not use a control group, 1 (5.9%) used a non-equivalent control, and 7 (41.2%) used an equivalent control group.

As compared to non-intervention studies, the intervention papers preferred to use Facebook over sexual/geo-social networking sites. In total, 76.5% of intervention studies used Facebook and 5.9% used a GSN, as compared to 48.1% and 33.3% respectively for non-intervention papers. Other platforms include independent websites (n=2, 11.7%), YouTube (n=2, 11.7%), independent blog (n=1, 5.9%), Bebo (n=1, 5.9%), High5 (n=1, 5.9%), Flickr (n=1, 5.9%), and Twitter (n=1, 5.9%).

SM-based interventions included in the review targeted several different sub-populations at high-risk of HIV: MSM (n=9, 52.9%), youth (n=5, 29.4%), and patients of sexual health clinics (n=2, 11.8%). Most studies focused on delivering HIV-related knowledge via social media (n=8, 47%). However, some studies sought to modify HIV testing (n=5, 29.4%), raise online awareness (n=4, 23.6%), and increase condom use (n=3, 17.6%). Of note is that most intervention-focused studies focused on primary prevention with participants that are at-risk of HIV (n=15, 88.2%). Only two studies focused on people living with HIV or AIDS.

**DISCUSSION**

The use of online SM for HIV prevention/care is as potentially useful as it is new. The growth of papers on this topic is reflective of this, with over 50% of the reviewed papers being published in 2014/2015 alone. The range of interventions reflects both the novelty and the possibilities of this topic. Out of 17 papers which had an intervention, 10 separate types of intervention were identified. The most common types of intervention were peer-leader based and informational posts, but even among these papers the specifics of the intervention and the online platforms used were highly variant. Some studies even attempted several
different interventions at once, such as text-based and internet-based notification for intimate-partners[34*].

There is an increasing amount of research applying either peer-leader or informational post methods to SM/SNSs. The science behind peer-leader based models in offline settings has been established, and much of the work in the current studies applied this method to an online setting. Many of these studies are thus exploratory, focusing more on the frequency of SM-use among different populations and the challenges with online recruitment[35*]. Importantly, three out of the four peer-leader interventions found some degree of positive impact, a finding in support of the peer leader model[36*]. The appeal of the informational post intervention was related to the low cost of using these online platforms to access large populations. However, the results from studies that use informational posts are mixed, with no positive findings in any of the interventions.

The most consistent theme throughout all of the 44 papers was the emphasis on either outreach/recruitment or prevention. Little work was focused on HIV+ populations. In fact, only two of the intervention papers focused on HIV+ populations. The lack of studies on HIV+ populations suggests a significant gap in the research. An additional point of note is that the target population was overwhelmingly focused on MSM or subpopulations of MSM. Few studies were focused on other high-risk populations such as IDUs, sex workers, and women. This finding is consistent with Park et al., 2013, who found minimal research on the use of SNS targeting youth/young adults [37]. It is important to include research on the broader populations affected by HIV, as each subgroup has their own unique cultural and social issues that might respond to programs, platforms, and interventions in different and unexpected ways. This raises issues of external validity with the literature, a concern also found in the fact that 77% (n=34) of the target populations came from either North America or Europe.

Online social platforms and media are constantly and rapidly evolving. Observing the frequency of platforms used throughout the research, over half of the studies (n=26) used Facebook and nearly a quarter (n=10) used one of several geo-social/sexual networking apps. This reflects the popularity of Facebook, given that there are now nearly 1 billion users, and the relevancy of the sexual and geo-social networking apps to the target populations [28]. Evidence in support of the relevancy of the GSNs is found in one interesting study from Phillips, et al. (2014), where it was found that 64% of MSMs use GSNs, and of these 58.9% use the GSNs to find a sexual partner [38**]. However, research might not be keeping up with online developments, as only five studies used Twitter and one used Instagram. One of the studies exemplifying the possibilities of these under-researched websites comes from Young, et al (2014) where over 500 million tweets were used to show the geographic relationship between HIV related Tweets and actual HIV health data [39**]. There is a general need for more formative research to assess whether the platforms involved in this field have been appropriate. There is a lack of research showing the relevancy of these platforms to the target platforms in regards to HIV and sexual health/behavior.
According to Yonker, et al., (2015) who wrote a systematic review of the literature on social media in adolescent and young adult health care, only 12 out of 87 relevant papers (14%) were intervention studies while the remaining were observational studies [40]. Our analysis confirmed this preference for observational studies, but not at such a dramatic rate. Another point of note is the need for more rigorous research methods: only 7 out of the 17 interventions used an equivalent control group (if this were used as an inclusion criteria, then the findings mimic those from Yonker, et al, with only 16% of the 44 papers being an intervention). Additionally, the majority of interventions were 6 months or less, meaning that there is limited measurement of long term effects. This is of note especially considering the Bull, et al. (2012) paper which found that the positive effects shown at 2 months-post intervention to be non-existent at 6 months [41]. A considerable need exists in this field to expand from the exploratory phase and move into rigorous research methods that explore long-term effects.

This study has limitations. One limitation of the current study is that it is not a meta-analysis and the effectiveness of the SM interventions were therefore not statistically evaluated. Additionally, only published papers were included in the study, conference abstracts and presentations were not included due to lack of inclusion in the database search results. It is therefore possible that this study could have missed some studies and other ongoing research. Future research on this topic can include ongoing research papers on this growing topic.

**Conclusion**

Social Media is immensely popular and is increasingly being used a tool in HIV research. The potential benefits from research on SM in this field are important for both the target populations and for the research community. Even with the increased number of research studies in this area, the use of SM to address issues along the HIV care continuum remains an under-researched topic, especially in regards to the various different combinations of SM platforms and interventions. There is an even greater need for statistically rigorous studies on efficacy, effectiveness, and long term effects. Finally, there are numerous subpopulations, both in the US and around the world that have not been accounted for or studied in this research. Of considerable importance is the lack of research into HIV+ community. Future research can help to address this need and improve the body of research in this rapidly growing field.

**Acknowledgments**

The authors wish to thank Jason Chiu and Mika Wang for feedback and assistance on previous versions of this manuscript. The authors thank the NIMH for funding this study.

**References**


15. DiClemente RJ, Sales JM, Borek N. Barriers to Adolescents’ Participation in HIV Biomedical Prevention Research. J Acquir Immune Defic Syndr 1999. 2010; 54:S12–S17.10.1097/QAI.0b013e3181e1e2e0


22. LeGrand S, Muessig KE, Pike EC, Baltierra N, Hightow-Weidman LB. If you build it will they come? Addressing social isolation within a technology-based HIV intervention for young black men who have sex with men. AIDS Care. 2014; 26:1194–1200. Several focus group discussions
were undertaken with 22 young black MSMs (22–30 years old). Discussions focused on social isolation and lack of support from both racism and homophobia. Study participants were receptive to the use of SNS to reduce social isolation and build a community.

10.1080/09540121.2014.894608 [PubMed: 24617609]


HealthMpowerment is a mobile app/online intervention meant to build communities and supportive relationships within young black MSMs and young black transgender woman (YBMSM/TW). Study was a 1-month trial with 15 participants. Significant improvement was evidenced in social support, social isolation, and depression. 10.1177/1090198114562043


31. The Health Communicator’s Social Media Toolkit. 2011

32. Lim MS, Vella A, Sacks-Davis R, Hellard ME. Young people’s comfort receiving sexual health information via social media and other sources. Int J STD AIDS. 2014; 25:1003–1008. Authors conducted a survey with 620 young people (16–29 years old) about social media and their comfort with receiving sexual health information via social media. Most participants reported being comfortable or very comfortable accessing sexual health information from websites (85%), followed by a doctor (81%), school (73%), and the mainstream media (67%). Fewer reported being comfortable getting information from social media: Facebook (52%), apps (51%), SMS (44%), and Twitter (36%). 10.1177/0956462414527264 [PubMed: 24616114]


34. Udeagu C-CN, Bocour A, Shah S, Ramos Y, Gutierrez R, Shepard CW. Bringing HIV partner services into the age of social media and mobile connectivity. Sex Transm Dis. 2014; 41:631–636. Authors compared three different forms of notification to partners of patients who recently tested positive for STI: traditional notification, text-based notification, and internet notification. Contact rate most successful with Text (77%), followed by traditional (69%) and internet (41%). Higher likelihood that people contacted over internet and text were notified as compared to traditional. However, traditionally notified partners were most likely to ultimately test for HIV (69%) as compared to text (45%) and internet (34%). 10% of those who were contacted over the internet and underwent an HIV test were positive for HIV. [PubMed: 25211262]

35. Hernandez-Romieu AC, Sullivan PS, Sanchez TH, Kelley CF, Peterson JL, del Rio C, et al. The Comparability of Men Who Have Sex With Men Recruited From Venue-Time-Space Sampling and Facebook: A Cohort Study. JMIR Res Protoc. 2014; 3 The authors compared MSM recruited through venue-based, time-space sampling (VBTS) with Facebook-based recruitment. Facebook recruits were older, had more sexual partners, engaged in more frequent unprotected anal
intercourse, and had similar retention pattern after 24 months between the two groups. 10.2196/resprot.3342

36. Young SD, Cumberland WG, Lee S-J, Jaganath D, Szekeres G, Coates T. Social networking technologies as an emerging tool for HIV prevention: a cluster randomized trial. Ann Intern Med. 2013; 159:318–324. Authors investigated whether SNS communities could increase HIV testing among African American and Latino MSM. This randomized control trial (RCT) consisted of 112 MSM randomized across 16 peer leaders within online, Facebook groups over a 12-week period. 95% of treatment and 73% of control used the online platform. 44% of treatment (n=25) requested an HIV test kit, with 36% (n=9) of those ultimately mailing the test kit for a test. This was compared to 20% (n=11) of the control requesting a kit, and 18% (n=2) ultimately mailing the kit. 10.7326/0003-4819-159-5-201309030-00005 [PubMed: 24026317]


38. Phillips G, Magnus M, Kuo I, Rawls A, Peterson J, Jia Y, et al. Use of geosocial networking (GSN) mobile phone applications to find men for sex by men who have sex with men (MSM) in Washington, DC. AIDS Behav. 2014; 18:1630–1637. This was the first study to compare GSN use and sex-seeking behaviors. 63.6% of MSM in study have used GSN to find other men in the last year, of this group 58.9% have looked for sexual partners. Users of GSN are more likely to identify as homosexual, undergo HIV testing, have depressive symptoms, and belief that their last sexual partner was engaging in concurrent partnerships. 10.1007/s10461-014-0760-9 [PubMed: 24682866]


Highlights

- Most studies in this area were observational.
- The focus areas of the studies was evenly distributed between outreach outreach/recruitment (n=15, 34.1%), surveillance/observation (n=13, 29.5%) and prevention/treatment (n=16, 36.4%).
- Researchers used Facebook (n=26, 59.1%), multiple-platforms (n=13, 29.5%), or one of several geo-social networking sites (n=10, 22.7%).
- Studies primarily targeted men who have sex with men (MSM) (n=24, 54.5%) and youth (n=13, 29.5%) with little research focused on HIV+ populations (n=5, 11.4%).
Table 1


<table>
<thead>
<tr>
<th>Title</th>
<th>First Author/Year</th>
<th>Platform</th>
<th>Location</th>
<th>Target</th>
<th>Number of participants</th>
<th>Focus of Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drama and danger: the opportunities and challenges of promoting youth sexual health through online social networks.</td>
<td>Veinot, 2011</td>
<td>Focus groups - NOT online</td>
<td>USA</td>
<td>Youth</td>
<td>94</td>
<td>Outreach/Recruitment, and Surveillance/Observation</td>
</tr>
<tr>
<td>Finding Teens in TheirSpace: Using Social Networking Sites to Connect Youth to Sexual Health Services</td>
<td>Ralph, 2011</td>
<td>MySpace</td>
<td>USA (CA)</td>
<td>Youth</td>
<td>993</td>
<td>Outreach/Recruitment</td>
</tr>
<tr>
<td>Adolescents’ Views Regarding Uses of Social Networking Websites and Text Messaging for Adolescent Sexual Health Education</td>
<td>Sellke, 2011</td>
<td>Offline recruitment</td>
<td>USA (MN)</td>
<td>Youth</td>
<td>29</td>
<td>Outreach/Recruitment</td>
</tr>
<tr>
<td>Tweeting about testing: do low-income, parenting adolescents and young adults use new media technologies to communicate about sexual health?</td>
<td>Dwecha, 2012</td>
<td>Facebook, LinkedIn, MySpace, Twitter, multiple GSNs</td>
<td>USA (CT)</td>
<td>Youth</td>
<td>94</td>
<td>Outreach/Recruitment</td>
</tr>
<tr>
<td>Use of the Location-Based Social Networking Application GRINDR as a Recruitment Tool in Rectal Microbicide Development Research</td>
<td>Burell, 2012</td>
<td>Grindr</td>
<td>USA (CA)</td>
<td>MSM</td>
<td>17</td>
<td>Outreach/Recruitment</td>
</tr>
<tr>
<td>Epidemiology, Sexual Risk Behavior, and HIV Prevention Practices of Men who Have Sex with Men Using GRINDR in Los Angeles, California</td>
<td>Landovitz, 2012</td>
<td>Grindr</td>
<td>USA (LA)</td>
<td>Youth, MSM</td>
<td>375</td>
<td>Outreach/Recruitment</td>
</tr>
<tr>
<td>Never testing for HIV among men who have sex with men recruited from a sexual networking website, United States.</td>
<td>Margolis, 2012</td>
<td>Sexual networking sites</td>
<td>USA</td>
<td>MSM</td>
<td>8,100</td>
<td>Surveillance/Observation</td>
</tr>
<tr>
<td>Technology use and reasons to participate in social networking websites among people living with HIV in the US.</td>
<td>Horvath, 2012</td>
<td>Facebook, LinkedIn, Bebo, TheBody, MySpace, Pot, Xanga</td>
<td>USA (MN)</td>
<td>HIV-positive</td>
<td>312 surveys, 22 focus group members</td>
<td>Outreach/Recruitment</td>
</tr>
<tr>
<td>Putting prevention in their pockets: developing mobile phone-based HIV interventions for black men who have sex with men.</td>
<td>Muesing, 2013</td>
<td>Social media (online journals) and focus groups</td>
<td>USA (CT)</td>
<td>Black MSM</td>
<td>22</td>
<td>Surveillance and Outreach/Recruitment</td>
</tr>
<tr>
<td>Young people's comfort receiving sexual health information via social media and other sources.</td>
<td>Lim, 2014</td>
<td>Comparison of social networks vs. doctor vs. other</td>
<td>USA</td>
<td>Youth</td>
<td>620</td>
<td>Outreach/Recruitment</td>
</tr>
<tr>
<td>Still a Hard-to-Reach Population? Using Social Media to Recruit Latino Gay Couples for an HIV Intervention Adaptation Study</td>
<td>Martinez, 2014</td>
<td>Craigslist, Facebook, Jack'd, Grindr, Twitter, Instagram, SCRUFF</td>
<td>USA (NYC)</td>
<td>MSM</td>
<td>14 couples (28 individuals)</td>
<td>Outreach/Recruitment</td>
</tr>
<tr>
<td>The compatibility of men who have sex with men recruited from venue-time-space sampling and Facebook: a cohort study</td>
<td>Hernandez-Romieu, 2014</td>
<td>Facebook</td>
<td>USA (GA)</td>
<td>MSM</td>
<td>110 from Facebook, 651 from offline</td>
<td>Outreach/Recruitment</td>
</tr>
<tr>
<td>Using Online Social Media for Recruitment of Human Immunodeficiency Virus-Positive Participants: A Cross-Sectional Survey</td>
<td>Yuan, 2014</td>
<td>Facebook, Twitter, LinkedIn, Craigslist, and Tumblr</td>
<td>USA (CA)</td>
<td>HIV-positive</td>
<td>1221</td>
<td>Outreach/Recruitment</td>
</tr>
<tr>
<td>If you build it will they come? Addressing social isolation within a technology-based HIV intervention for young black men who have sex with men.</td>
<td>LeGrand, 2014</td>
<td>Focus groups - NOT online</td>
<td>USA (NC)</td>
<td>Young black MSM</td>
<td>22</td>
<td>Outreach/Recruitment</td>
</tr>
<tr>
<td>Use of Geosocial Networking (GSN) Mobile Phone Applications to Find Men for Sex by Men Who Have Sex with Men (MSM) in Washington, DC</td>
<td>Phillips, 2014</td>
<td>Geo-social networking apps (Grindr/Encounture)</td>
<td>USA (DC)</td>
<td>MSM</td>
<td>379</td>
<td>Outreach/Recruitment</td>
</tr>
<tr>
<td>Sexual risk behavior, alcohol use, and social media use among secondary school students in informal settlements in Cape Town and Port Elizabeth, South Africa</td>
<td>Kardian, 2014</td>
<td>Offline recruitment</td>
<td>South Africa</td>
<td>Youth</td>
<td>4,485 secondary school students</td>
<td>Outreach/Recruitment</td>
</tr>
<tr>
<td>Are online support groups always beneficial? A qualitative exploration of the empowering and disempowering</td>
<td>Mo, 2014</td>
<td>Online bulletin board</td>
<td>Hong Kong</td>
<td>HIV-positive</td>
<td>115</td>
<td>Prevention/Treatment</td>
</tr>
<tr>
<td>Title</td>
<td>First Author/Year</td>
<td>Platform</td>
<td>Location</td>
<td>Target</td>
<td>Number of participants</td>
<td>Focus of Research</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>-------------------</td>
<td>---------------------------</td>
<td>-------------------------</td>
<td>-----------------------------------------</td>
<td>------------------------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>processes of participation within HIV/AIDS-related online support groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epidemiology of sexual health in the virtual environment: A multinational online survey of Spanish- and Portuguese-speaking men who use an internet social networking site</td>
<td>Biello, 2014</td>
<td>Sexual networking sites</td>
<td>Latin America, Spain, Portugal</td>
<td>Spanish and Portuguese speaking MSM from Latin America</td>
<td>36,063</td>
<td>Surveillance/Observation</td>
</tr>
<tr>
<td>Methods of using real-time social media technologies for detection and remote monitoring of HIV outcomes</td>
<td>Young, 2014</td>
<td>Twitter</td>
<td>USA</td>
<td>General public</td>
<td>553,186,061 tweets</td>
<td>Surveillance/Observation</td>
</tr>
<tr>
<td>Sexual risk and HIV prevention behaviors among African-American and Latino MSM social networking users.</td>
<td>Chiu, 2014</td>
<td></td>
<td>USA</td>
<td>MSM</td>
<td>118 Participants</td>
<td></td>
</tr>
<tr>
<td>A social media-based HIV prevention intervention using peer leaders.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stimulant use among African American and Latino MSM social networking users.</td>
<td>Young, 2013</td>
<td>Offline/Online Recruitment</td>
<td>USA(LA)</td>
<td>MSM</td>
<td>118 Participants</td>
<td></td>
</tr>
<tr>
<td>The relationship between online social networking and sexual risk behaviors among men who have sex with men (MSM).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sexual risk and HIV prevention behaviors among African-American and Latino MSM social networking users.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social media technologies for HIV prevention study retention among minority men who have sex with men (MSM).</td>
<td>Young, 2014</td>
<td>Offline/Online Recruitment</td>
<td>USA(LA)</td>
<td>MSM</td>
<td>118 Participants</td>
<td></td>
</tr>
<tr>
<td>Methods for measuring diffusion of a social media-based health intervention.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feasibility of Recruiting Peer Educators to Promote HIV Testing Using Facebook Among Men Who have Sex with Men in Peru</td>
<td>Menacho, 2015</td>
<td>Recruitment on Facebook</td>
<td>Peru</td>
<td>MSM</td>
<td>34 Peer Leaders</td>
<td></td>
</tr>
</tbody>
</table>
### Table 2

Social Media/HIV Studies by Intervention Description, 2011–2015.

<table>
<thead>
<tr>
<th>Title</th>
<th>First Author/Year</th>
<th>Platform</th>
<th>Location</th>
<th>Target</th>
<th>Sample</th>
<th>Focus of Research</th>
<th>Intervention Description</th>
<th>Length of Study</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation of the use of a social networking site in sexual health care</td>
<td>Hedge, 2011</td>
<td>Myspace, Facebook, Bebo, and High 5</td>
<td>UK</td>
<td>Patients</td>
<td>78</td>
<td>Prevention/Treatment</td>
<td>Forum-Based</td>
<td>22 months</td>
<td>No</td>
</tr>
<tr>
<td>Social Media-Delivered Sexual Health Intervention: A Cluster Randomized Controlled Trial</td>
<td>Bull, 2012</td>
<td>Facebook</td>
<td>USA</td>
<td>Youth</td>
<td>1,578</td>
<td>Prevention/Treatment</td>
<td>Informational Posts</td>
<td>2 and 6 months</td>
<td>Yes</td>
</tr>
<tr>
<td>Mobilizing homeless youth for HIV prevention: a social network analysis of the acceptability of a face-to-face and online social networking intervention</td>
<td>Rice, 2012</td>
<td>Facebook and Myspace</td>
<td>USA</td>
<td>Youth</td>
<td>7,52, and 103</td>
<td>Prevention/Treatment</td>
<td>Peer-Leader</td>
<td>11 weeks</td>
<td>No</td>
</tr>
<tr>
<td>Effects of Internet Popular Opinion Leaders (iPOL) Among Internet-Using Men Who Have Sex With Men</td>
<td>Ko, 2013</td>
<td>Facebook</td>
<td>Taiwan</td>
<td>MSM</td>
<td>1,092</td>
<td>Prevention/Treatment</td>
<td>Peer Leader</td>
<td>6 months</td>
<td>Non-equivalent</td>
</tr>
<tr>
<td>Let’s Blog about Health! Exploring the Persuasiveness of a Personal HIV Blog compared to an Institutional HIV Website</td>
<td>Neubaum, 2014</td>
<td>Blog (<a href="http://www.soscisurvey.de">www.soscisurvey.de</a>)</td>
<td>Germany</td>
<td>Gen. public</td>
<td>261</td>
<td>Prevention/Treatment</td>
<td>Blog-Based</td>
<td>Instantaneous</td>
<td>Yes</td>
</tr>
<tr>
<td>Sexual Health Promotion on Social Networking Sites: A Process Evaluation of the FaceSpace Project</td>
<td>Nguyen, 2013</td>
<td>Facebook, Youtube, Flicker, Twitter, and Myspace</td>
<td>Australia</td>
<td>Youth</td>
<td>900 fans</td>
<td>Surveillance/Observation</td>
<td>Informational Posts</td>
<td>6 months</td>
<td>No</td>
</tr>
<tr>
<td>An Internet-Based Intervention (Condom Hint) to Increase Condom Use Among HIV-Positive Men Who Have Sex With Men (Protocol) for a Randomized Controlled Trial</td>
<td>Miranda, 2013</td>
<td>Indepen. website</td>
<td>USA</td>
<td>HIV+, MSM</td>
<td>60</td>
<td>Prevention/Treatment</td>
<td>Informational Posts</td>
<td>Unknown</td>
<td>Yes</td>
</tr>
<tr>
<td>HIV education and counselling using Facebook: A possible new approach</td>
<td>Rossotti, 2014</td>
<td>Facebook</td>
<td>Italy</td>
<td>Gen. public</td>
<td>open to public</td>
<td>Prevention/Treatment</td>
<td>Expert Led</td>
<td>6 months</td>
<td>No</td>
</tr>
<tr>
<td>Social Networking Technologies as an Emerging Tool for HIV Prevention: A Cluster Randomized Trial</td>
<td>Young, 2013</td>
<td>Facebook</td>
<td>USA (LA)</td>
<td>MSM (African American and Latino)</td>
<td>112</td>
<td>Prevention/Treatment</td>
<td>Peer-Leader</td>
<td>3 months/1-Year</td>
<td>Yes</td>
</tr>
<tr>
<td>Project HOPE: online social network changes in an HIV prevention randomized controlled trial for African American and Latino men who have sex with men.</td>
<td>Young, 2014</td>
<td>Facebook</td>
<td>USA (NYC)</td>
<td>MSM</td>
<td>556 participants</td>
<td>Prevention/Treatment</td>
<td>Peer-Leader</td>
<td>9 months</td>
<td>Yes</td>
</tr>
<tr>
<td>The HOPE social media intervention for global HIV prevention in Peru: a cluster randomized controlled trial</td>
<td>Young, 2015</td>
<td>Facebook</td>
<td>Peru</td>
<td>MSM</td>
<td>556 participants</td>
<td>Prevention/Treatment</td>
<td>Peer-Leader</td>
<td>9 months</td>
<td>Yes</td>
</tr>
<tr>
<td>Feasibility, acceptability, and preliminary efficacy of a live-chat social media intervention to reduce HIV risk among young men who have sex with men.</td>
<td>Lelutiu-Weinberger, 2014</td>
<td>Facebook</td>
<td>USA (NYC)</td>
<td>MSM, Youth</td>
<td>41</td>
<td>Prevention/Treatment</td>
<td>Live Chat</td>
<td>3 Months</td>
<td>No</td>
</tr>
</tbody>
</table>

*Note: For the sake of brevity, some platforms and locations are abbreviated.*
<table>
<thead>
<tr>
<th>Title</th>
<th>First Author/Year</th>
<th>Platform</th>
<th>Location</th>
<th>Target</th>
<th>Sample</th>
<th>Focus of Research</th>
<th>Intervention Description</th>
<th>Length of Study</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>“My YAP Family”: Analysis of a Facebook Group for Young Adults Living with HIV.</td>
<td>Gaysynsky, 2014</td>
<td>Facebook</td>
<td>USA (NYC)</td>
<td>Youth, HIV+</td>
<td>43</td>
<td>Surveillance/Observation</td>
<td>Online Support Group</td>
<td>4 months</td>
<td>No</td>
</tr>
<tr>
<td>Bringing HIV Partner Services Into the Age of Social Media and mobile connectivity</td>
<td>Udeagu, 2014</td>
<td>Facebook and other sexual networking sites (A4A)</td>
<td>USA (NYC)</td>
<td>Sexual partners</td>
<td>275 partners</td>
<td>Prevention/Treatment</td>
<td>Partner Notification</td>
<td>22 months and 10 months</td>
<td>Yes</td>
</tr>
<tr>
<td>Acceptability and Feasibility of Using Established Geosocial and Sexual Networking Mobile Applications to Promote HIV and STD Testing Among Men Who Have Sex with Men.</td>
<td>Sun, 2014</td>
<td>Geo-social and sexual networking apps (A4A Radar, Grindr, Jack’d, and Scruff)</td>
<td>USA</td>
<td>MSM</td>
<td>457 participants</td>
<td>Prevention/Treatment</td>
<td>Passive Recruitment</td>
<td>7 months</td>
<td>No</td>
</tr>
<tr>
<td>HealthMpowerment.org: Building Community Through a Mobile-Optimized, Online Health Promotion Intervention</td>
<td>Hightow-Weidman, 2015</td>
<td>Independent website</td>
<td>USA</td>
<td>MSM, TG</td>
<td>15</td>
<td>Prevention/Treatment</td>
<td>Informational Posts</td>
<td>1 month</td>
<td>No</td>
</tr>
</tbody>
</table>