Published in final edited form as:

Vaccine. 2018 June 18; 36(26): 3868–3875. doi:10.1016/j.vaccine.2018.02.043.

Facilitators of and barriers to HPV vaccination among sexual and gender minority patients at a Boston community health center

Kaan Z. Apaydin^a, Holly B. Fontenot^b, Derri Shtasel^c, Sannisha K. Dale^d, Christina P.C. Borba^e, Christopher S. Lathan^f, Lori Panther^a, Kenneth H. Mayer^g, and Alex S. Keuroghlian^{h,*}

^aThe Fenway Institute, United States

^bThe Fenway Institute and Boston College, United States

^cHarvard Medical School and Massachusetts General Hospital, United States

^dUniversity of Miami and Massachusetts General Hospital, United States

^eBoston University School of Medicine and Boston Medical Center, United States

^fDana-Farber Cancer Institute, United States

^gThe Fenway Institute, Beth Israel Deaconess Medical Center, United States

^hThe Fenway Institute, Harvard Medical School, and Massachusetts General Hospital, United States

Abstract

Background: Young sexual minority individuals have lower human papillomavirus (HPV) vaccine completion rates than the general population, and little is known about how gender minority people perceive HPV vaccination. The aim of this study was to qualitatively identify patient-, provider-, and systems-level barriers and facilitators for HPV vaccination among sexual and gender minority (SGM) people.

Methods: Fifteen SGM-identified individuals, ages 23–26, were recruited at an urban community health center in Boston, MA, that specializes in care for SGM. Participants were enrolled in a study that utilized surveys and in-person focus groups. During focus groups, participants were asked to describe their perceived barriers and facilitators for completion of HPV vaccination.

Results: Fourteen participants reported having a sexual minority identity, and five participants reported having a gender minority identity. Participants described the following factors influencing HPV vaccination: (1) at the *patient level*, low HPV-related knowledge and lack of engagement in care were associated with less vaccination, whereas fear of HPV-related disease motivated vaccination; (2) at the *provider level*, knowledge and SGM cultural-competence related to HPV

*Corresponding author at: Fenway Health, 1340 Boylston Street 8th floor, Boston, MA 02215, United States. akeuroghlian@partners.org (A.S. Keuroghlian).

Conflict of interests

The authors have no conflicts of interest to report.

was associated with patient willingness to be vaccinated; (3) at the systems level, SGM identity-affirming healthcare settings were associated with increased vaccination, whereas historical trends in HPV vaccine marketing selectively for cisgender women and lack of public awareness of HPV-related disease among SGM were associated with decreased vaccination.

Conclusion: Our study identified internal and external barriers for HPV vaccination related among SGM patients. These findings highlight the need to increase public awareness about the risks of HPV-related disease among SGM and educate SGM youth about HPV-related disease and vaccine importance. Finally, this study supports the need for future interventions to cultivate SGM-competent providers and SGM identity-affirming healthcare settings as a way to increase HPV vaccination.

Keywords

Human papillomavirus; HPV; Vaccine; HPV-related cancers; Sexual and gender minority; Transgender

1. Introduction

Human papillomavirus (HPV) is the most commonly acquired sexually transmitted infection in the U.S. [1]. HPV is associated with more than 90% of cervical and anal cancers, 70% of oropharyngeal cancers, and 63% of penile cancers [2] and the incidence of HPV-attributable cancers in the United States is 31,500 annually [3]. Vaccination is the primary measure to prevent HPV-related cancers and associated disease. National guidelines recommend routine vaccination for all children at age 11, and catch-up vaccination for females up to 26 years old and males up to 21 years old. Routine vaccination is also recommended for men 22–26 years old who are HIV-infected or who have sex with men (MSM) [4,5].

The research on HPV vaccination among sexual and gender minority (SGM) populations is limited. SGM make up approximately 3–12% of the U.S. adult population [6]. SGM have unique health care needs [7,8] and face disproportionate barriers to health care access compared with their non-SGM counterparts. Known barriers for SGM youth include: lack of insurance coverage, economic disadvantages, lack of health care provider (HCP) knowledge about SGM-related health issues, negative HCP attitudes toward SGM, stigma, and discrimination [9–12].

Most young MSM (YMSM) in the U.S. remain unvaccinated despite the higher prevalence of anal HPV among MSM compared with men who have sex with women (MSW) and HIV-infected MSM compared to HIV-uninfected MSM [13]. Several studies have found that among YMSM ages 18 to 26, only 4.9–13% report receiving 1-dose toward completing the 3-dose vaccine series [14–16].

Among transgender women, transgender men, women who have sex with women (WSW) and other SGM, research on anal HPV infection, HPV-related cancers and HPV vaccination is very limited. One study investigating HPV vaccination among YMSM and transgender women in two U.S. cities has found that only 14% received 1-dose [17].

Prevalence of HPV infection is higher among women who have sex with both men and women (WSMW) compared to women who have sex with only men (WSM) [18]. Despite this risk, only 15% of SGM females aged 19–26 received 1-dose of HPV vaccine compared to 41.6% among national population of females [19,20]. Similarly, WSM were 20% more likely to receive 1-dose of HPV vaccine compared to WSMW and WSW [21].

The aim of this study was to identify patient-, provider- and systems-level barriers to and facilitators for HPV vaccination among eligible SGM patients at an urban community health center specialized in care for SGM patients [22]. To our knowledge, this is the first qualitative study exploring knowledge, attitudes and behaviors regarding HPV vaccination in a sample broadly inclusive of SGM subgroups, with varied HIV status.

2. Methods

2.1. Study design

We conducted a focus group study with a purposive sample of SGM individuals, including a quantitative survey component, from June 2016 to September 2016 at a community health center in Boston, Massachusetts. Protocols and procedures were approved by the health center's Institutional Review Board (IRB). In accordance with the health center's patient privacy policy, all patients had previously been informed that their information may be used for research, that their information may be disclosed to researchers, and that this disclosure may be related to determining whether or not a patient may be eligible for a study. Vaccine-eligible SGM youth, ages 18–26 years, who could read/understand English were recruited from our health center. The health center's Informatics and Data Services Department generated reports of potentially eligible participants using the Electronic Health Record (EHR), which were shared with our study team under an approved waiver of authorization. All potential participants were also stratified by HIV Status (Infected or Uninfected) and Vaccination Status (Completed or Not Completed). Per the IRB-mandated recruitment process, study staff then contacted qualified participant's primary care providers (PCPs) to briefly explain the study and obtain permission to recruit the patient. If authorized, we contacted the patient via email and/or phone to screen for eligibility. A total of 214 eligible patients were contacted during the recruitment process. If eligible and interested, participants were enrolled in 1 of 4 focus groups: HIV-uninfected and 3-dose HPV vaccine complete; HIV-uninfected and 3-dose NOT complete; HIV-infected and 3-dose complete; HIV-infected and 3-dose NOT complete.

Participants completed a verbal consent and a survey with 143 questions (30 min), and participated in 60-min discussion sessions facilitated by two investigators (K.Z.A. and A.S.K.) in the health center's private conference room. Discussions were recorded by a digital audio recorder and transcribed verbatim by a professional transcription service. Participants received \$50 and a meal, which is standard for 90-min study visits at the health center, as remuneration. At the end of each focus groups, participants received five minutes of health education about HPV-related disease and the importance of completing HPV vaccination.

2.2. Measures

Participants completed a questionnaire assessing demographic information, health information, HPV-related practices, and HPV knowledge; questions were adapted from previous studies [23–26]. Demographic data included age, race/ethnicity, education, income, health insurance type, sexual orientation/gender identity (SO/GI), relationship status, and HIV status. Health-related questions focused on how often the patient sees a PCP, presence or absence of sexual activity, numbers of sex partners, types of sexual activity, condom use, and use of tobacco products. HPV-related questions focused on HPV vaccination, HPV diagnosis, HPV status of sex partners, and sources of HPV vaccine information.

Focus groups were guided by an open-ended, semi-structured script. The script elicited participant knowledge, beliefs, and perceptions regarding HPV/HPV vaccination, with a focus on perceived barriers and facilitators to vaccination. The script was adapted from a previous study exploring barriers to and facilitators of HPV vaccination among only YMSM [27]. Examples of questions are presented in Table 1.

2.3. Data analysis

Questionnaire data were organized and analyzed in Excel version 15 (Microsoft, Redmond, WA). Descriptive analyses of the surveys included means, standard deviations, and percentages.

Transcripts were imported into Dedoose Version 7.0.23 (SocioCultural Research Consultants, LLC, Los Angeles, CA) for data management and thematic content analysis. K.Z.A read all the transcripts and created the initial codebook. The development of the codebook was based on both deductive and inductive analysis [28]. K.Z.A and A.S.K independently coded all the transcripts with the initial codebook and a Kappa statistic was calculated on the higher level themes (patient-, provider- and systems-level barriers/facilitators) as 0.843 ($p < 0.001$) using SPSS version 22 (IBM, Armonk, NY) [29]. K.Z.A and A.S.K met to discuss and resolve discrepancies in coding, then coded at the sub-theme level, met again to resolve further discrepancies, collapsed codes if needed, and reached final agreement in data analysis.

3. Results

3.1. Characteristics of the sample

The sample included 15 SGM-identifying participants with a mean age of 25 years (range: 23–26) (see Table 2). The majority were sexually active (80%) and reported multiple visits to their PCP each year. The prevalence of HIV infection among participants was 26.7%. The majority reported initiation (80.0%) or completion (73.3%) of the HPV vaccine series. The participants' primary source of HPV information was visiting the health center (80.0%).

3.2. Qualitative analysis

Three levels of barriers and facilitators for HPV vaccine completion were analyzed: (1) patient-level, (2) provider-level, and (3) systems-level.

3.2.1. Patient-level barriers and facilitators—At the patient-level, three sub-themes emerged as factors influencing HPV vaccination: (1) HPV-related knowledge/beliefs, (2) behaviors related to engagement in care, and (3) fear of HPV-related disease.

3.2.1.1. HPV-related knowledge/beliefs. Most participants identified a lack of knowledge about how HPV affects both male and females as a vaccination barrier. Regardless of vaccination status, participants had low knowledge of HPV and HPV-related cancers. Many did not know what HPV was, how HPV-related diseases progress, or ways to prevent HPV-related disease. When asked about which cancers HPV causes, most identified cervical cancer but were unaware of anal, oropharyngeal, and penile cancers. Some incorrectly associated testicular, prostate and ovarian cancers with HPV.

Three gay men reported believing most men do not know that HPV can affect men, and as a result, most gay men do not receive the HPV vaccine. They also stated that they were not aware of HPV-related disease in men until their PCP explained this at the time of vaccination. One transgender man reported believing that being “born in a female body” made him susceptible to HPV-related disease. Another transgender man reported believing that many SGM people do not understand appropriate timing of HPV vaccination, such as whether to receive the vaccine before or after engaging in sexual activity. One gay man reported:

“I had no idea that it associated itself with cancer. As far as I did know, it [HPV] just caused warts.”

Unvaccinated transgender women described being unaware of the risks associated with HPV-infection in the context of transfeminine bodies. One stated:

“I feel like I still want to know more [about HPV-related disease]. I still feel like I have questions and I want to know what are the risks, and really detailed, like, how often do these things [warts and HPV-related cancers] happen.”

Both of the transgender women in the study emphasized that they were not aware of any research associated with HPV and their gender identity. One transgender woman reported that she was practicing abstinence prior to gender reassignment surgery; therefore, she believed the HPV vaccine was not relevant for her. Another transgender woman, who was sexually active, was not worried about HPV either before or after her surgery.

3.2.1.2. Behaviors related to engagement in care. Some participants stated that they had started the vaccine series with a previous provider but had not complete all doses. They now were completing the series with a new PCP, and one lesbian woman reported:

“You know, I think the second time around, I set, like, a calendar reminder for myself.”

A transgender man also reported completing the vaccine off-schedule after having difficulties following the recommended schedule the first time. Participants who reported not completing the vaccine series described barriers with: long time intervals between doses; multiple doses; and the inconvenience of work conflicting with clinic hours. Fully vaccinated participants described monitoring their own timeline for dose completion and

following up with their PCP to confirm appointments as behaviors that facilitated 3-dose completion.

One unvaccinated transgender woman described the intersection of HPV-related knowledge, beliefs, and behaviors related to engagement in care:

“I forgot that there were a series of shots. That actually was kind of another barrier for me, because I’ll have to come in multiple times for this, when I - especially when I didn’t really feel like I needed it. If it were just like one simple shot, I might have went for it. [...] And then I have anxiety being in public, so there’s that. To minimize the amount of times in there is useful. Plus, for something that I don’t really feel like it really applies to me, it’s like -- it didn’t seem -- it doesn’t seem worth it.”

3.2.1.3. Fear of HPV-related disease.: Fear of HPV-related disease was a vaccine facilitator among HIV-infected gay men. Fully vaccinated three HIV-infected gay men reported that HIV seroconversion made them more cautious about their health. Some described that despite having no idea about HPV, they received the HPV vaccine along with other vaccines due to the fear of any health consequences related to HIV seroconversion. One gay man stated:

“I kind of panicked a little bit when I was diagnosed with HIV, but then I’m like, OK, I’m getting everything. So it’s like -- I got it [HPV vaccine].”

They also described that fear of genital warts was a stronger motivator for vaccination than the fear of HPV-related cancers. After learning about HPV-related cancers, an HIV-infected gay man who was not 3-doses complete, was now worried about developing cancer. One transgender man reported series completion because he preferred “to be on the safe side,” since he was overweight and had high blood pressure.

3.2.2. Provider-level barriers and facilitators—At the provider-level, two sub-themes emerged as factors influencing HPV vaccination: (1) the PCP’s knowledge/expertise related to HPV, and (2) SGM identity-affirming care.

3.2.2.1. Pcp’s knowledge/expertise related to HPV.: Participants described their PCP’s knowledge/expertise related to HPV as a facilitator for vaccination. One gay man reported:

“[PCP at the health center] gave me a lot of documentation to read through and just sat there and talked to me so I could learn about the benefits of receiving the HPV vaccine and, from a male perspective, how that can help me prevent genital warts, anal cancer.”

Some also stated that their PCP’s expert care was the only facilitator for vaccination. Fully vaccinated gay men described how their PCPs took the time to explain the benefits of HPV vaccination for males, and how the vaccine prevents genital warts and anal cancers. As a result of this education, fully vaccinated HIV-infected gay men reported awareness of being at lower risk for HPV-related diseases. Fully vaccinated transgender men stated that their

SGM affirming PCPs' HPV recommendation sparked their series completion, which had been previously initiated but never completed.

3.2.2.2. SGM identity-affirming care.: Participants described uncomfortable interactions with previous PCPs when discussing their sexual activity, and they identified these discussions with PCPs as invalidating and therefore barriers to HPV vaccination. One gay man described previous patient-provider relationship as “transactional” and identified these interactions as a barrier to vaccination. One lesbian described similar difficulty having sexual health and HPV-related conversations with her previous PCPs. She also described the affirming and trusting relationship with her current PCP as a vaccine facilitator. Several participants reported SGM affirming care by their PCP as an important facilitator of series completion. One gay man stated:

“I think it’s about being comfortable with your doctor, and having those [sexual health and HPV-related] conversations with them.”

Additionally, participants perceived that SGM status of their PCP would lead to greater comfort in and understanding from patient-provider interactions. Gay men described having a high comfort level communicating about their past health as a facilitator for vaccination. Fully vaccinated transgender men identified that gender-affirming care resulted in high comfort levels and trust in their PCP, as facilitators of vaccination.

3.2.3. Systems-level barriers and facilitators—At the systems-level, three sub-themes emerged as factors influencing HPV vaccination: (1) SGM identity-affirming healthcare system, (2) historical trends in HPV vaccine marketing selectively for cisgender women, and (3) public awareness of HPV-related diseases.

3.2.3.1. SGM identity-affirming healthcare system.: Participants described their experiences in healthcare systems that did not affirm their SGM identities as “uncomfortable” and “negative.” One lesbian woman reported that she did not like to go to the doctor until she switched her PCP to an SGM identity-affirming healthcare system:

“[...] before I found [the health center], I didn’t like going to the doctor. It felt like -- I was very uncomfortable about it.”

A gay man stated that he had previously encountered barriers accessing health services relevant to him as a MSM. He also reported more difficulty accessing affirming health services in parts of the country which he perceived as less accepting of his sexual orientation.

Participants, regardless of HIV status, gender identity, and/or sexual orientation, described the importance of receiving medical services at an SGM identity-affirming healthcare system as a major facilitator of vaccination. Overall participants described their current healthcare setting as safe, engaging, comfortable, responsive, judgement-free, and approachable for SGM patients. One transgender man described SGM-affirmation of the health center:

“Not even just the healthcare providers of [the health center], but people in general that are in the building, so to speak. I’ve never felt judged. And that’s so rare.”

3.2.3.2. Historical trends in HPV vaccine marketing selectively for cisgender

women.: Most of the participants identified historical trends in HPV vaccine marketing selectively for cisgender straight women as a barrier to vaccination. Gay male participants described being told that HPV-related diseases were more common among women, and observing vaccine advertising never mentioning the relevance for men. As a result, they believed the vaccine was only designed for women. They explained that marketing biases led them to believe that men are less susceptible to HPV-related disease and therefore they did not need to be concerned. A lesbian women agreed that marketing has propagated the public impression that HPV vaccination is primarily for women. Non-vaccinated transgender woman reported being unaware of HPV-related risks:

“[The HPV vaccine] being marketed more towards, like, cis women...it made me think I’m not sure if I necessarily need it or if it would be effective on me.”

Additionally, transgender women also shared:

“... all of the television ads are for cis women. You know, there’s -- it always would say, oh, you know, men can have it, but they’re not going to present any of the symptoms.”

These participants did not believe they were eligible for the HPV vaccine on the basis that they were not engaging in sexual activity in a manner anatomically similar to many cisgender women. They also emphasized the lack of research on HPV-related disease in the context of transgender bodies.

3.2.3.3. Public awareness of HPV-related diseases.: Participants identified the overall lack of public awareness about HPV-related disease as a barrier to vaccination. One transgender woman stated that she had heard of HIV and AIDS as something to worry about, but not HPV. Others described lower levels of public awareness about HPV as compared to other sexually transmitted infections:

“I still don’t think that it’s necessarily included in the top STDs people think of. When I think of it, it’s like HIV is this big scary thing and then like syphilis, gonorrhea, chlamydia is like this conglomerated thing.”

Many reported being heartened by recent public health messaging about how HPV-related disease can impact all people regardless of sexual orientation or gender identity.

3.2.4. Perspectives among vaccine non-complete and HIV-infected

participants—Among participants who did not initiate the HPV vaccine or complete all 3-doses, lack of knowledge about the association between HPV and cancer, as well as lack of awareness about the risk of HPV-related diseases among SGM, were barriers to vaccine completion. On the other hand, facilitators of HPV vaccination among HIV-infected participants were heightened fear of HPV-related disease in the context of prior HIV infection, HCP-driven education about and endorsement of the vaccine, and identity affirmation within an SGM-focused health care setting.

Further illustrative quotes by participants are included in Table 3.

4. Discussion

This is the first qualitative study investigating perceived barriers and facilitators for HPV vaccination among SGM people that included a broad range of SGM identified youth with varied HIV status. Unique needs and challenges in achieving HPV 3-dose completion were highlighted. In this study at a health center specialized in SGM-affirming care, we observed higher HPV vaccine completion rates (73.3%) compared to completion in the general population and among SGM reported in previous studies [14–21,30]. However, participants reported several initial vaccine barriers, including lack of awareness about HPV and HPV-related cancers other than cervical.

Among vaccine non-complete participants (26.7%), 2 were cisgender men and 2 were transgender women. Consistent with our findings, previous studies document that receiving 1-dose among MSM is associated with higher HPV knowledge, an HIV diagnosis, disclosing sexual orientation/behavior to one's HCP, and receiving a HCP recommendation [14–16]. HPV vaccine barriers among MSM include: costs, access to care [25,31,32], lower perceived risk [16], and non-disclosure of same-sex behavior [32]. Transgender women in our study believed that HPV/HPV vaccination did not apply to them. This is consistent with existing studies where transgender women had limited knowledge of HPV, HPV-related disease, and vaccination [33–35].

The 3-dose vaccine regime and unique age recommendations for SGM late adolescents/young adults presents additional challenges [5]. Participants reported difficulty keeping track dosing schedules and finding time for vaccination. Strategies to overcome these barriers may include utilization of mobile technologies to remind SGM of appointments and bundling HPV vaccination with other health visits [27]. Systematic vaccination of all youth with only two doses prior to age 15 may also mitigate challenges experienced by providers and parents in facilitating 3-dose vaccine completion among SGM at older ages [4].

Recommendation by HCPs is one of the most important facilitators for vaccine initiation and completion [15,36]. Previous research highlighted the association between HCPs' strength of HPV vaccine endorsement and HPV vaccination [37], and enhancing strength of recommendation among providers have increased HPV vaccination rates among adolescents [38]. Among YMSM, disclosure of sexual behavior to HCPs is a strong mediator for HPV vaccination [39]. Participants in this study identified specific aspects of their provider-patient engagement as facilitators of vaccine completion, including: education about HPV/HPV vaccine relevance for SGMs, SGM-affirming care, and provider comfort in discussing sexual orientation/ behaviors. Participants described PCPs' inquiry about vaccination status as instrumental in prompting 3-dose completion. Our findings point to the need for healthcare systems to train their providers to engage in sensitive, affirming, and effective communication with young SGM patients.

Among gay men and transgender women, social constructs of HPV as a cisgender women's issue and cisgender female-focused marketing were vaccine barriers [40]. These barriers led

gay men and transgender women in our study to believe they were not susceptible to HPV-related diseases, and that vaccination was not necessary for them, despite being aware of HPV vaccination campaigns for cisgender women. This gender bias among men and women in general has been investigated previously [41], albeit without a comprehensive focus on SGM subpopulations. Only one previous study included transgender women but grouped them with MSM when reporting results [17]. Most gay men and transgender women do not receive the HPV vaccine [14–17], which highlights the need for creating more SGM-inclusive media campaigns. Of note, despite social constructs regarding HPV as a cisgender women's issue, disparities in vaccination persist based on sexual orientation even among cisgender women: low percentages of lesbian-identified women from U.S. rural (28%) and urban (38%) areas report discussing HPV vaccination with their HCP or receiving their HCP's recommendation for vaccination [42].

This study highlighted the importance of SGM-competency and affirmation at both the provider- and healthcare system-levels as facilitators of health and HPV vaccination. Training both clinical and non-clinical staff in SGM-competency can help establish a safe and inclusive environment for patients to return for follow-up appointments and 3-dose completion [43]. Similarly, among YMSM, patient's disclosure of same-sex behaviors to HCP and HCP's communication on sexual orientation/ behavior were crucial in receipt of vaccination [39,44]. Thus, there is an urgent need to systematically expand the target population for HPV vaccination [5,45], by creating SGM-inclusive marketing campaigns, SGM-focused patient education materials, and promoting ways to increase SGM identity-affirming health care. These recommendations are uniquely tailored for SGM based on our findings, as compared with existing recommendations for general population [46].

5. Limitations

This qualitative study should be viewed in light of its limitations. Our relatively small and predominantly white sample was derived from a community health center in Boston, MA, that specifically focuses on SGM health. This may reduce the generalizability of our findings to other SGM communities. Another limitation is that we did not collect data on how many participants initiated or completed HPV vaccination prior to initiating care at the SGM specialized health center. Our study is strengthened by inclusion of a broad range of SGM identities, as well as both HIV-infected and HIV-uninfected youth, which to date has been underexplored in HPV vaccine research.

6. Conclusion

Our study can help guide researchers, HCPs and healthcare systems in understanding the unique HPV vaccination barriers and facilitators experienced by SGM. Barriers to vaccine completion identified by SGM included: lack of awareness about HPV and HPV vaccination relevance for SGM, 3-dose scheduling, lack of SGM-competency among PCPs, and the social constructs associated with HPV/ HPV vaccination. Facilitators of vaccine completion included: proactive health-seeking behaviors, fear of genital warts, fear of health problems after HIV seroconversion, pre-existing health conditions that prompt more general engagement in care, PCPs' HPV knowledge/expertise, PCPs' SGM-competency, and access

to SGM identity-affirming healthcare settings. These results can help inform future SGM-tailored HPV vaccination strategies.

Acknowledgements

The authors would like to acknowledge the participants for sharing their stories and experiences to help further our understanding. The authors thank the Treffler Practitioner Program for Cancer Equity at the Kraft Center for Community Health Leadership, which financed this study through a grant awarded to A.S.K. This project was also supported by NIMH K01MH100428 awarded to C.P.C.B. We also thank the data management team at The Fenway Institute for assistance identifying potential focus group participants, as well as Dana Pardee, Director of Epidemiology Projects at The Fenway Institute, and Sarah McLean, Public Health Projects Manager for Latin America at The Fenway Institute, for sharing their expertise in conducting focus groups and analyzing qualitative research data.

References

- [1]. Satterwhite CL, Torrone E, Meites E, Dunne EF, Mahajan R, Ocfemia MCB, et al. Sexually transmitted infections among US women and men. *Sex Transm Dis* 2013;40:187–93. 10.1097/OLQ.0b013e318286bb53. [PubMed: 23403598]
- [2]. Saraiya M, Unger ER, Thompson TD, Lynch CF, Hernandez BY, Lyu CW, et al. US assessment of HPV types in cancers: Implications for current and 9-valent HPV vaccines. *J Natl Cancer Inst* 2015;107 10.1093/jnci/djv086.
- [3]. Centers for disease control and prevention. How many cancers are linked with HPV each year? 2017 <https://www.cdc.gov/cancer/hpv/statistics/cases.htm> [accessed June 14, 2017].
- [4]. Meites E, Kempe A, Markowitz LE. Use of a 2-dose schedule for human papillomavirus vaccination — updated recommendations of the advisory committee on immunization practices. *MMWR Morb Mortal Wkly Rep* 2016;65:1405–8. <https://doi.org/10.15585/mmwr.mm6549a5>. [PubMed: 27977643]
- [5]. Markowitz LE, Dunne EF, Saraiya M, Chesson HW, Curtis CR, Gee J, et al. Human papillomavirus vaccination recommendations of the advisory committee on immunization practices (ACIP). *MMWR Recomm Rep* 2014;63:1–30.
- [6]. Gates GJ. How many people are lesbian, gay, bisexual, and transgender? *Williams Inst* 2011;1–8. 10.1080/13691058.2012.673639.
- [7]. Mayer KH, Bradford JB, Makadon HJ, Stall R, Goldhammer H, Landers S. Sexual and gender minority health: What we know and what needs to be done. *Am J Public Health* 2008;98:989–95. 10.2105/AJPH.2007.127811. [PubMed: 18445789]
- [8]. Healthy People. Companion document for lesbian, gay, bisexual, and transgender (LGBT) health. *Gay Lesbian Med Assoc* 2010;2001 10.1002/9780470996720.ch26.
- [9]. Hanneman T Healthcare equality index 2017: celebrating a decade of promoting equitable and inclusive care for lesbian, gay, bisexual, transgender and queer patients and their families. Washington, DC: Hum Rights Campaign; 2017.
- [10]. Westerstahl A, Segesten K, Björkelund C. GPs and lesbian women in the consultation: issues of awareness and knowledge. *Scand J Prim Health Care* 2002;20:203–7. 10.1080/02813430231004845. [PubMed: 12564570]
- [11]. IOM (Institute of Medicine). The health of lesbian, gay, bisexual, and transgender people: building a foundation for better understanding. Washington, DC: The National Academies Press: 2011. doi:10.17226/13128.
- [12]. Quinn GP, Sanchez JA, Sutton SK, Vadaparampil ST, Nguyen GT, Green BL, et al. Cancer and lesbian, gay, bisexual, transgender/transsexual, and queer/ questioning (LGBTQ) populations. *Cancer Sex Minor* 2015;65:384–400. 10.3322/caac.21288.
- [13]. Palefsky JM, Rubin M. The epidemiology of anal human papillomavirus and related neoplasia. *Obstet Gynecol Clin North Am* 2009;36:187–200.10.1016/j.ogc.2009.02.003. [PubMed: 19344856]

- [14]. Meites E, Markowitz LE, Paz-Bailey G, Oster AM, White J, Todd J, et al. HPV vaccine coverage among men who have sex with men - National HIV Behavioral Surveillance System, United States, 2011. *Vaccine* 2014;32:6356–9. 10.1016/j.vaccine.2014.09.033. [PubMed: 25258097]
- [15]. Reiter PL, McRee A-L, Katz ML, Paskett ED. Human Papillomavirus Vaccination Among Young Adult Gay and Bisexual Men in the United States. *Am J Public Health* 2015;105:96–102. 10.2105/AJPH.2014.302095. [PubMed: 25393178]
- [16]. Cummings T, Kasting ML, Rosenberger JG, Rosenthal SL, Zimet GD, Stupiansky NW. Catching up or missing out? human papillomavirus vaccine acceptability among 18- to 26-year-old men who have sex with men in a US national sample. *Sex Transm Dis* 2015;42:601–6. 10.1097/OLQ.0000000000000358. [PubMed: 26462183]
- [17]. Gorbach PM, Cook R, Gratzner B, Collins T, Parrish A, Moore J, et al. Human papillomavirus vaccination among young men who have sex with men and transgender women in 2 US cities. *Sex Transm Dis* 2017;44:436–41. 10.1097/OLQ.0000000000000626. [PubMed: 28608795]
- [18]. Reiter PL, McRee A-L. HPV infection among a population-based sample of sexual minority women from USA. *Sex Transm Infect* 2017;93:25–31. 10.1136/sextrans-2016-052536. [PubMed: 27165699]
- [19]. Jones J, Poole A, Lasley-Bibbs V, Johnson M. LGBT health and vaccinations: Findings from a community health survey of Lexington-Fayette County, Kentucky, USA. *Vaccine* 2016;34:1909–14. 10.1016/j.vaccine.2016.02.054. [PubMed: 26930365]
- [20]. Williams W, Peng-Jun L, O'Halloran A, Kim D, Grohskopf L. Surveillance of vaccination coverage among adult populations — United States, 2015. *MMWR Surveill Summ* 2017;66:1–28. <https://doi.org/10.15585/mmwr.ss6501a1>.
- [21]. Charlton BM, Reisner SL, Agénor M, Gordon AR, Sarda V, Austin SB. Sexual orientation disparities in human papillomavirus vaccination in a longitudinal cohort of U.S. males and females. *LGBT Heal* 2017 10.1089/lgbt.2016.0103.
- [22]. Mayer K, Appelbaum J, Rogers T, Lo W, Bradford J, Boswell S. The evolution of the fenway community health model. *Am J Public Health* 2001;91:892–4. [PubMed: 11392929]
- [23]. Pitts MK, Fox C, Willis J, Anderson J. What do gay men know about human papillomavirus? Australian gay men's knowledge and experience of anal cancer screening and human papillomavirus. *Sex Transm Dis* 2007;34:170–3. 10.1097/01.olq.0000230436.83029.ce. [PubMed: 16837830]
- [24]. Brewer NT, Ng TW, McRee AL, Reiter PL. Men's beliefs about HPV-related disease. *J Behav Med* 2010;33:274–81. 10.1007/s10865-010-9251-2. [PubMed: 20162346]
- [25]. Thomas EA, Goldstone SE. Should I or Shouldn't I: Decision making, knowledge and behavioral effects of quadrivalent HPV vaccination in men who have sex with men. *Vaccine* 2011;29:570–6. 10.1016/j.vaccine.2010.09.101. [PubMed: 20950728]
- [26]. Fenkl EA, Schochet E, Jones SG, da Costa BR. Evaluation of an HPV/anal cancer screening awareness program for HIV-infected men who have sex with men. *J Assoc Nurses AIDS Care* 2015;26:492–7. 10.1016/j.jana.2015.01.003. [PubMed: 25682353]
- [27]. Fontenot HB, Fantasia HC, Veters R, Zimet GD. Increasing HPV vaccination and eliminating barriers: Recommendations from young men who have sex with men. *Vaccine* 2016;34:6209–16. 10.1016/j.vaccine.2016.10.075. [PubMed: 27838067]
- [28]. Burla L, Knierim B, Barth J, Liewald K, Duetz M, Abel T. From text to codings: intercoder reliability assessment in qualitative content analysis. *Nurs Res* 2008;57:113–7. [PubMed: 18347483]
- [29]. Everitt BS. Making sense of statistics in psychology: a second-level course. Oxford, UK: Oxford University Press; 1996.
- [30]. Walker TY, Elam-Evans LD, Singleton JA, Yankey D, Markowitz LE, Fredua B, et al. National, regional, state, and selected local area vaccination coverage among adolescents aged 13–17 years — United States, 2016. *MMWR Morb Mortal Wkly Rep* 2017;66:874–82. <https://doi.org/10.15585/mmwr.mm6633a2>. [PubMed: 28837546]
- [31]. Sadlier C, Lynam A, O'Dea S, Delamere S, Quinlan M, Clarke S, et al. HPV vaccine acceptability in HIV-infected and HIV negative men who have sex with men (MSM) in Ireland. *Hum Vaccines Immunother* 2016;12:1536–41. 10.1080/21645515.2016.1151588.

- [32]. Nadarzynski T, Smith H, Richardson D, Pollard A, Llewellyn C. Perceptions of HPV and attitudes towards HPV vaccination amongst men who have sex with men: A qualitative analysis. *Br J Health Psychol* 2017;22:345–61. 10.1111/bjhp.12233. [PubMed: 28191723]
- [33]. Supindham T, Chariyalertsak S, Utaipat U, Miura T, Ruanpeng D, Chotirosniramit N, et al. High prevalence and genotype diversity of anal HPV infection among MSM in Northern Thailand. *PLoS One* 2015;10:1–17.10.1371/journal.pone.0124499.
- [34]. dos Ramos Farías MS, Garcia MN, Reynaga E, Romero M, Vaulet MLG, Fermepín MR, et al. First report on sexually transmitted infections among trans (male to female transvestites, transsexuals, or transgender) and male sex workers in Argentina: High HIV, HPV, HBV, and syphilis prevalence. *Int J Infect Dis* 2011;15:7–9. 10.1016/j.ijid.2011.05.007.
- [35]. Nureña CR, Brown B, Galea JT, Sánchez H, Blas MM. HPV and genital warts among peruvian men who have sex with men and transgender people: knowledge, attitudes and treatment experiences. *PLoS One* 2013;8 10.1371/journal.pone.0058684.
- [36]. Holman DM, Benard V, Roland KB, Watson M, Liddon N, Stokley S. Barriers to Human Papillomavirus Vaccination Among US Adolescents. *JAMA Pediatr* 2014;168:76 10.1001/jamapediatrics.2013.2752. [PubMed: 24276343]
- [37]. Gilkey MB, Calo WA, Moss JL, Shah PD, Marciniak MW, Brewer NT. Provider communication and HPV vaccination: The impact of recommendation quality. *Vaccine* 2016;34:1187–92. 10.1016/j.vaccine.2016.01.023. [PubMed: 26812078]
- [38]. Krantz L, Ollberding NJ, Beck AF, Carol Burkhardt M. Increasing HPV vaccination coverage through provider-based interventions. *Clin Pediatr (Phila)* 2017 10.1177/0009922817722014.
- [39]. Stupiansky NW, Liao A, Rosenberger J, Rosenthal SL, Tu W, Xiao S, et al. Young men's disclosure of same sex behaviors to healthcare providers and the impact on health: results from a US national sample of young men who have sex with men. *AIDS Patient Care STDS* 2017;31:342–7. 10.1089/apc.2017.0011. [PubMed: 28753396]
- [40]. Daley EM, Vamos CA, Zimet GD, Rosberger Z, Thompson EL, Merrell L. The feminization of HPV: Reversing gender biases in US human papillomavirus vaccine policy. *Am J Public Health* 2016;106:983–4. 10.2105/AJPH.2016.303122. [PubMed: 27153015]
- [41]. Daniel-Ulloa J, Gilbert PA, Parker EA. Human papillomavirus vaccination in the United States: Uneven uptake by gender, race/ethnicity, and sexual orientation. *Am J Public Health* 2016;106:746–7. 10.2105/AJPH.2015.303039. [PubMed: 26890185]
- [42]. Barefoot KN, Warren JC, Smalley KB. Women's health care: The experiences and behaviors of rural and urban lesbians in the USA. *Rural Remote Health* 2017;17:1–16.
- [43]. Keuroghlian A, Ard K, Makadon H. Advancing health equity for lesbian, gay, bisexual and transgender (LGBT) people through sexual health education and LGBT-affirming health care environments. *Sex Health* 2017;119–22.10.1071/SH16145. [PubMed: 28160786]
- [44]. Wheldon CW, Sutton SK, Fontenot HB, Quinn GP, Giuliano AR, Vadaparampil ST. Physician communication practices as a barrier to risk-based HPV vaccine uptake among men who have sex with men. *J Cancer Educ* 2017;1–6.10.1007/s13187-017-1223-6.
- [45]. Center for Disease Control and Prevention. (CDC). Recommendations on the use of quadrivalent human papillomavirus vaccine in males — advisory committee on immunization practices (ACIP), 2011. *MMWR Morb Mortal Wkly Rep* 2011;60:1705–8. [PubMed: 22189893]
- [46]. Center for disease control and prevention (CDC). Vaccination Schedules & Recommendations 2017 <https://www.cdc.gov/hpv/hcp/schedulesrecommendations.html> [accessed January 25, 2018].

Table 1

Focus group questions.

Tell me about the kinds of things you seek healthcare for?
Would you ever seek healthcare for just vaccines?
Tell me what you know about the human papillomavirus (HPV)?
Tell me what you know about cancers caused by HPV?
Tell me what you know about the HPV vaccine?
What would be good/bad about getting the HPV vaccine?
What made you stay on track or prevent you from staying on track for completing 3-dose HPV vaccine series?
Tell me about your experience with your primary care provider (PCP) on HPV and HPV vaccine?
What elements of your relationship with your PCP encourage you to get or prevent you from getting the HPV vaccine?
What are your thoughts on how HPV and HPV vaccine are related to your gender identity and/or sexual orientation?
What factors at patient-, provider- and systems-level make it easier/difficult for you to get the vaccine?

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 2

Sample characteristics (N = 15).

	Mean (Range)	SD
<i>Demographics</i>	25 (23–26)	0.7
<i>Age</i>	n	%
<i>Race/ethnicity</i>		
White	10	66.7
Hispanic/Latino	1	6.7
Black/African American	2	13.3
Asian	1	6.7
More than one race	1	6.7
<i>Highest level education</i>		
Less than high school	1	6.7
High school graduate	5	33.3
College graduate	6	40.0
Post graduate	3	20.0
<i>Annual household income</i>		
<\$10,000	5	33.3
\$10,000–29,999	2	13.3
\$30,000–49,999	1	6.7
\$50,000–79,999	4	26.7
\$80,000–120,000	3	20.0
<i>Health insurance</i>		
Private	7	46.7
Public	8	53.3
<i>Gender identity</i>		
Cisgender man	9	60.0
Cisgender woman	1	6.7
Transman (TM)	3	20.0
Transwoman (TF)	2	13.3
<i>Sexual orientation</i>		
Gay/lesbian	9	60.0
Straight/heterosexual	1	6.7
Bisexual	2	13.3
Queer	1	6.7
Asexual	1	6.7
Pansexual	1	6.7
<i>Gender identity & sexual orientation</i>		
Cisgender man & gay	8	53.3
Cisgender man & pansexual	1	6.6
Cisgender woman & lesbian	1	6.6
Transman (TM) & straight/heterosexual	1	6.6

	Mean (Range)	SD
Transman (TM) & queer	1	6.6
Transman (TM) & asexual	1	6.6
Transwoman (TW) & bisexual	2	13.3
<i>Relationship status</i>		
Single	9	60.0
Dating	1	6.7
In A relationship	2	13.3
Living with partner	3	20.0
<i>HIV status</i>		
HIV-infected	4	26.7
HIV-uninfected	11	73.3
<i>Health behaviors</i>		
<i>Number of visits to a primary healthcare provider in the past year</i>		
1–3 Visits	8	53.3
>3 Visits	7	46.7
<i>Sexually active</i>		
Yes	12	80.0
No	3	20.0
<i>Number of lifetime sexual partners</i>		
Less than 5	3	20.0
5–19	4	26.7
20–49	4	26.7
> 50	4	26.7
<i>Number of sexual partners in the past 6 months</i>		
Less than 5	12	80.0
5–19	2	13.3
20–49	1	6.7
<i>Receptive anal sex in the past 6 months</i>		
Yes	9	60.0
No	6	40.0
<i>Receptive oral sex in the past 6 months</i>		
Yes	10	66.7
No	5	33.3
<i>Use of tobacco products</i>		
Yes	5	33.3
No	10	66.7
<i>HPV-related health behaviors</i>		
<i>HPV vaccine initiation</i>		
Yes	12	80.0
No	3	20.0
<i>3-Dose HPV vaccine completion</i>		
Yes	11	73.3

	Mean (Range)	SD
No	4	26.7
<i>Ever diagnosed with HPV</i>		
Yes	2	13.3
No	13	86.7
<i>Ever had a sexual partner with known HPV^a</i>		
Yes	2	13.3
No	7	46.7
Not sure	6	40.0
<i>Sources of HPV vaccine information</i>		
Doctor's visit	12	80.0
Internet	4	26.7
Other health professionals	2	13.3
Television	1	6.7
Practice nurse	1	6.7
Family and friends	0	0

^aKnowledge of partner's HPV status may have been based on visible warts or verbal communication with the partner.

Table 3

Illustrative quotes.

Categories	Illustrative quotations
<i>Patient-level barriers and facilitators</i>	
HPV-related knowledge/beliefs	“If I didn’t have the knowledge [about HPV vaccination]. Because I think that that’s what stops people in general. (cisgender man, HIV-infected, vaccinated)”; “I started to read more articles from different perspectives online about [HPV] and how men – male-bodied people – transmit it and carry it and that everyone needs to be vaccinated against it to stop it from spreading and that it can cause, especially men who receive penetrative sex can get it in the same way that women do. (cisgender man, HIV-infected, vaccinated)”; “even though I identify as male, I think it’s important to remember that I was born female, so I have these risks. (transman, HIV-uninfected, vaccinated)”; “I’m not into putting things into my body that I don’t need to be putting into my body. So it’s like I need a reason. I don’t want to be like just give it all to me. I want there to be, like, long-term studies that, oh, we’ve done this, and, OK, it’s proven to be safe and it’s proven to be something that’s really beneficial (transwoman, HIV-uninfected, unvaccinated)”
Behaviors related to engagement in care	“I think people just forget. They probably just forget, you know, if you have to take it spaced out, over time. I know, like I think I – I forgot about it the first go-around, and had to go again. (cisgender woman, HIV-uninfected, vaccinated)”; “... you know, going back and coming back, and going back [for 3 doses], it’s too much work. (transman, HIV-uninfected, vaccinated)”; “I kind of had the whole timeline laid out before I started even with the first dose, and then just before I would leave the office that same day schedule a follow-up appointment. So it was already in my calendar (cisgender man, HIV-infected, vaccinated)”
Fear of HPV-related disease	“... fear and wanting that assurance of I will not get these things [warts and cancer] if I do this [getting the vaccine] kind of outweighed that ethical value set that I had. (cisgender man, HIV-infected, vaccinated)”; “there’s definitely this like fear for me I feel like, and probably a lot of people, of getting genital warts or anal warts or more so than even cancer. I feel like people are just like – the physical disgust around that kind of thing and that stigma in our culture I think really propels – propelled me and a lot of people to get the vaccine to prevent that kind of thing from happening. (cisgender man, HIV-infected, vaccinated)”
<i>Provider-level barriers and facilitators</i>	
PCP’s knowledge/expertise related to HPV	“it helped ... when my doctor asked about that, and I said, “Oh yeah, I think I’ve heard about that. If the vaccination is something I should look into.” And then she recommended it. (cisgender man, HIV-uninfected, vaccinated)”; “she brought [the HPV vaccine] up again, and I said, “Oh, yeah.” So, that’s really only [my PCP’s] doing. (cisgender man, HIV-uninfected, vaccinated)”; “the rest of my information [about HPV] came from [my PCP]. When he started telling me about it and then did the vaccinations; (cisgender man, HIV-infected, vaccinated)”
SGM identity-affirming care	“it was a conversation with my doctor, and going to when I was at my visit, and asking about my sexual orientation, you know, my sexual activity, and wondering if I was at a different – you know, seeing a different doctor somewhere else, if I would have had the same type of – you know, if my doctor would have thought of [the HPV vaccine] as something that I needed to get, or should get. (cisgender man, HIV-uninfected, vaccinated)”; “... I experienced a very open line of communication between my provider and that allowed not only him to ask me questions, but me to talk about my past and talk about things that I would otherwise feel uncomfortable talking with my previous provider. And so that prompted us to discuss things that I wasn’t aware of including HPV vaccine and move forward with things like that. (cisgender man, HIV-infected, vaccinated)”; “I feel more comfortable with a male doctor or healthcare provider, because I identify as male. So... And he’s just very approachable. (transman, HIV-uninfected, vaccinated)”
<i>Systems-level barriers and facilitators</i>	
SGM identity-affirming healthcare system	“here [at the health center], it’s just, you know, simple questions, and pretty straightforward, and OK, well, then here’s what you should consider [regarding sexual health]. (cisgender man, HIV-uninfected, vaccinated)”; “In my experience, I don’t think that I would have considered getting the vaccine if it wasn’t for my doctor and the setting, I might not, probably have, at this point. (cisgender man, HIV-uninfected, vaccinated)”; “even if I do see a different face [at the health center] that’s normally what it is. And it’s judgment free. (cisgender man, HIV-infected, vaccinated)”; “... knowing that [staff at the health center] were specifically geared towards GLBTQ people helped. (transman, HIV-uninfected, vaccinated)”
Historical trends in HPV vaccine marketing selectively for cisgender women	“I think when the HPV vaccine came out it wasn’t tailored towards men. (cisgender man, HIV-uninfected, unvaccinated)”; “the biggest thing, again, was primarily marketed towards women, which – cisgender women – is, then, the question of, well, then, why did I bother, as a male? You know, as a cisgender male, it doesn’t make sense for me. (cisgender man, HIV-uninfected, vaccinated)”; “seeing ads on TV and stuff for [HPV vaccine]. And it was always marketed very much catered towards women. (cisgender man, HIV-infected, vaccinated)”; “I know when they talk about it on TV, they never really

Categories	Illustrative quotations
Public awareness of HPV-related disease	mention anything about males. Normally they mention a lot about women. (cisgender man, HIV-infected, vaccinated)” “in the past six months, I’ve heard more and more and more about it [HPV vaccine]. (cisgender man, HIV-uninfected, unvaccinated)”; “...HIV, AIDS, that’s what you’ve got to worry about. I’m not sure if I’ve ever heard of HPV before. (transwoman, HIV-uninfected, unvaccinated)”