

Vaccination Response to an Ongoing Meningitis Outbreak: Uptake and Attitudes among Men Who Have Sex with Men in Los Angeles, CA



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AUTHORS

Ian W. Holloway, MSW, MPH, PhD

Elizabeth S.C. Wu, MPH

Jennifer Gildner, MSPH

Vincent L. Fenimore, PhD, MEd

Paula M. Frew, PhD, MA, MPH

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ABOUT THE CALIFORNIA HIV/AIDS RESEARCH PROGRAM

The California HIV/AIDS Research Program fosters outstanding and innovative research that responds to the needs of all people of California, especially those who are often under served, by accelerating progress in prevention, education, care, treatment, and a cure for HIV/AIDS. The California HIV/AIDS Research Program supports two Collaborative HIV/AIDS Policy Research Centers, for research and policy analysis that addresses critical issues related to HIV/AIDS care and prevention in California. These centers include the University of California, Los Angeles; APLA Health; Los Angeles LGBT Center; University of California, San Francisco; San Francisco AIDS Foundation; and Project Inform.

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Background and Significance

The California Department of Public Health (CDPH) estimates that there were 27 cases of invasive meningococcal disease (IMD) in an ongoing outbreak in Southern California (as of March 9, 2017), which primarily affected men who have sex with men (MSM) in Los Angeles, San Diego, Orange, and Ventura Counties.^{1,2} MSM communities are at particularly high risk for meningococcal infection.

Risk factors include close and intimate contact with multiple partners, regularly visiting crowded venues such as bars and parties, sharing cigarettes, recreational drug use, and other risk factors.^{2,3} MSM are also disproportionately impacted by HIV, which puts them at particular risk of negative health outcomes if infected with IMD. Of IMD cases from the most recent outbreak, 2 cases were MSM living with HIV/AIDS.²

Even with treatment, IMD has a high mortality and morbidity rate; without treatment, fatality can be as high as 70%.⁴ IMD is often characterized with sudden onset of high fever, headache, nausea, vomiting, rash, stiff neck, and confusion, which can lead to rapid septic shock and death if not treated quickly. Additionally, IMD can lead to loss of limbs, hearing impairment, and central nervous system and kidney failure.^{3,4} One in 5 survivors experience serious lifelong impairment from IMD.⁴ The high mortality and morbidity associated with IMD necessitates a strong public health response whenever an outbreak occurs.

Federal, State and Local public health organizations have issued recommendations that encourage MSM and people living with HIV/AIDS (PLWHA) to be vaccinated for IMD. In June 2016 the Advisory Committee on Immunization Practices (ACIP), the group that develops Centers for Disease Control and Prevention (CDC) recommendations on immunization, voted to recommend quadrivalent meningococcal conjugate vaccine (MCV4) immunization for people living with HIV/AIDS (PLWHA), a group at especially high risk of meningitis infection.^{5,6} In response to the recent outbreak in Southern California, the CDPH issued a health advisory that urged at-risk adult gay and bisexual men, and all people with HIV, to get vaccinated.⁷ In Los Angeles County, the Department of Public Health Immunization Program has actively supported campaigns for increasing MCV4 immunization with MSM and PLWHA.

Meningococcal Vaccine Recommendations for PLWHA*

- All HIV-infected persons aged ≥ 2 months should routinely receive MCV4
- Persons aged ≥ 2 years with HIV who have not been previously vaccinated should receive a 2-dose primary series of MCV4
- Persons with HIV who have been previously vaccinated with MCV4 should receive a booster dose in accordance with ACIP recommendations to ensure highest vaccine efficacy at the earliest opportunity (at least 8 weeks after the previous dose) and then continue to revaccinate at appropriate intervals (approximately every 5 years).

*Source: CDC "Recommendations for Use of Meningococcal Conjugate Vaccines in HIV-Infected Persons – Advisory Committee on Immunization Practices, 2016"⁶

Meningococcal Vaccine Recommendations for MSM*

- MSM, regardless of HIV status, should receive 1 dose of MCV4. Persons who have previously received at least one dose of MCV4 more than 5 years prior should receive another dose.

**Source: Los Angeles County Department of Public Health "Meningococcal Conjugate Vaccines" <http://publichealth.lacounty.gov/acd/mening.htm>*

There are few published studies on vaccination uptake and response to immunization recommendations among MSM and PLWHA.^{8,9} Studies show that healthcare providers serving PLWHA may lack sufficient vaccine guideline knowledge¹⁰ due to slow dissemination of new vaccine recommendations.¹¹ Research has also shown that MSM living with HIV/AIDS have low vaccine completion rates for the second dose,¹² which may be due to lack of awareness about the necessity of a second dose, avoidance of additional doctor's appointments, or the misconception that vaccines can negatively affect viral load suppression and lower CD4 counts.^{13,14} Moreover, surveillance estimates based on immunization registry data may not be available for years, making it difficult to tailor an effective public health response to a recent outbreak. Meanwhile, gaps and challenges in immunization uptake continue, leaving MSM and PLWHA vulnerable to vaccine-preventable deaths and disablement resulting from preventable meningococcal infection.

In response to this important public health issue and the ongoing IMD outbreak in Southern California, the California HIV/AIDS Policy Research Centers initiated a project to estimate reported MCV4 immunization among MSM in Los Angeles, CA. In addition, we sought to understand the facilitators and barriers to the newest vaccination recommendation following the outbreak reporting.

Methods

From November 2016 through February 2017, we executed a "rapid response" venue-based sampling strategy and gathered survey data from MSM in Los Angeles, CA (See Table 1 for demographic breakdown of survey respondents). To be eligible for the study, respondents were required to have been identified as male at birth, currently identify as male, be age 18 and over, have had sex with men within the last 3 months, and be living in Los Angeles County. The venue sampling frame comprised of 146 locations, including bars/clubs, parks, community service organizations, bathhouses, gyms, coffee shops, restaurants, and stores. Ultimately, potential participants were recruited from 41 venues (see Figure 1 for breakdown of respondents recruited within specific venue categories).

Prior to each data collection outing, we randomly selected 4 venues from our sampling frame to send our team of trained interviewers for participant screening and enrollment. We approached any person appearing male who crossed a designated "venue line" at the entrance of the selected venue. Respondents who agreed to screening, and who were determined to be eligible, completed a 20 to 30-minute survey on an iPad tablet computer that was uploaded directly to the Qualtrics survey system.¹⁵ The survey covered a range of issues, including reported MCV4 status, knowledge, attitudes, and vaccination behaviors among other factors. Overall, 2,250 men were approached, 749 were screened, 529 were eligible, and 520 completed the survey. An additional seven participants were excluded from the present analysis because they reported their HIV serostatus as "unknown." Participants were compensated \$50 for their time.

Results

TABLE 1. Demographics of Survey Respondents (N=513)

	Overall	HIV Positive	HIV Negative
	N(%)	N(%)	N(%)
TOTAL	513 (100%)	61 (11.9%)	452 (88.1%)
AGE			
Mean (SD)	33 (10.1)	39 (11.2)	32.7 (9.7)
Range	18-74	22-65	18-74
SEXUAL BEHAVIOR			
Men only	462 (90.1%)	58 (95.1%)	404 (89.4%)
Men and Women	51 (9.7%)	3 (4.9%)	48 (10.6%)
ETHNICITY			
Hispanic	187 (36.5%)	29 (47.5%)	158 (35.0%)
Non-Hispanic	324 (63.2%)	32 (52.5%)	292 (64.6%)
Decline	2 (0.4%)	0 (0.0%)	2 (0.4%)
RACE			
White	249 (48.5%)	20 (32.8%)	229 (50.7%)
Black/African-American	84 (16.4%)	15 (24.6%)	69 (15.3%)
Asian/Pacific Islander	23 (4.5%)	2 (3.3%)	21 (4.6%)
American Indian	3 (0.6%)	2 (3.3%)	1 (0.2%)
Other	100 (19.5%)	16 (26.2%)	84 (18.6%)
Two or more	38 (7.4%)	4 (6.6%)	34 (7.5%)
Decline	16 (3.1%)	2 (3.3%)	14 (3.1%)
INSURANCE			
Insured	444 (86.6%)	56 (91.8%)	388 (85.8%)
Uninsured	60 (11.7%)	5 (8.2%)	55 (12.2%)
Other	9 (1.8%)	0 (0.0%)	9 (2.0%)

Despite the recent IMD outbreak and subsequent vaccination recommendations, the majority of survey respondents, regardless of HIV status, were not protected against types of IMD prevented by MCV4 immunization. 37.7% of HIV-positive survey respondents and 25.4% of HIV-negative survey respondents reported receiving MCV4 immunization. Additionally, 23.0% of HIV-positive survey respondents and 29.7% of HIV-negative survey respondents were unsure whether they had received the MCV4 immunization at all (see Figure 2 “MCV4 Vaccinations Among Survey Participants by HIV Status”). Among HIV-positive respondents who received at least one dose, 69.6% (16/23) received a second dose. This number reflects 26.2% (16/61) of all HIV positive people in our sample.

FIGURE 1. Venue categories from Which MSM Were Recruited (N=41)

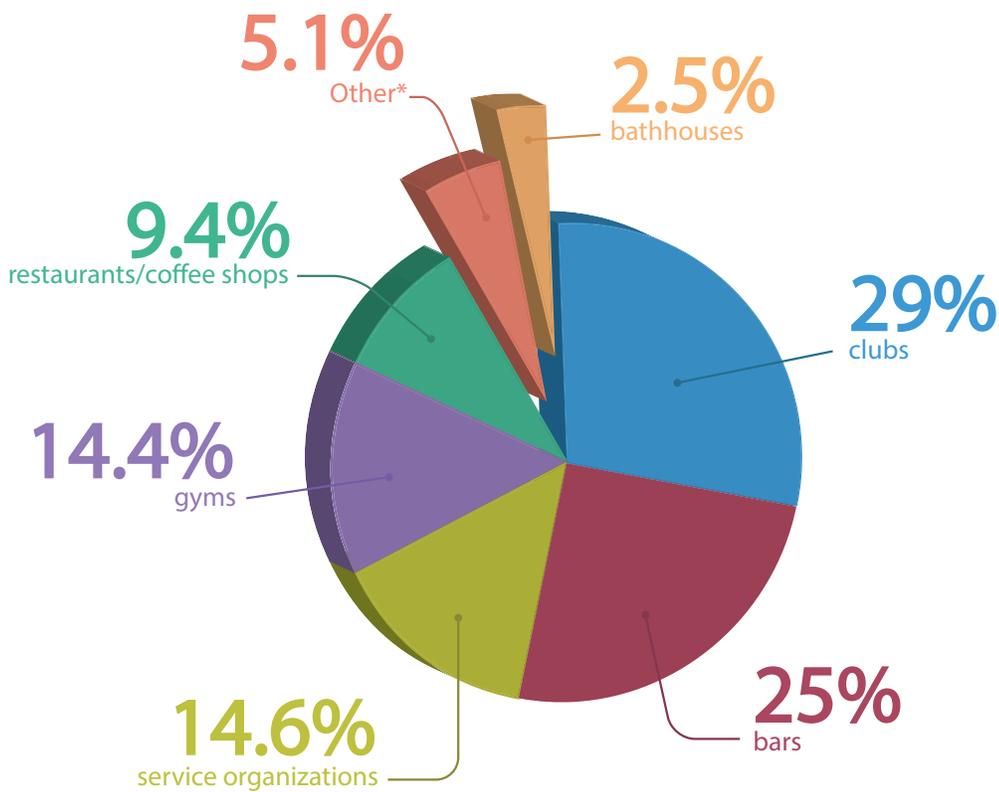


FIGURE 2. MCV4 Immunization Among All Survey Participants (N=513)

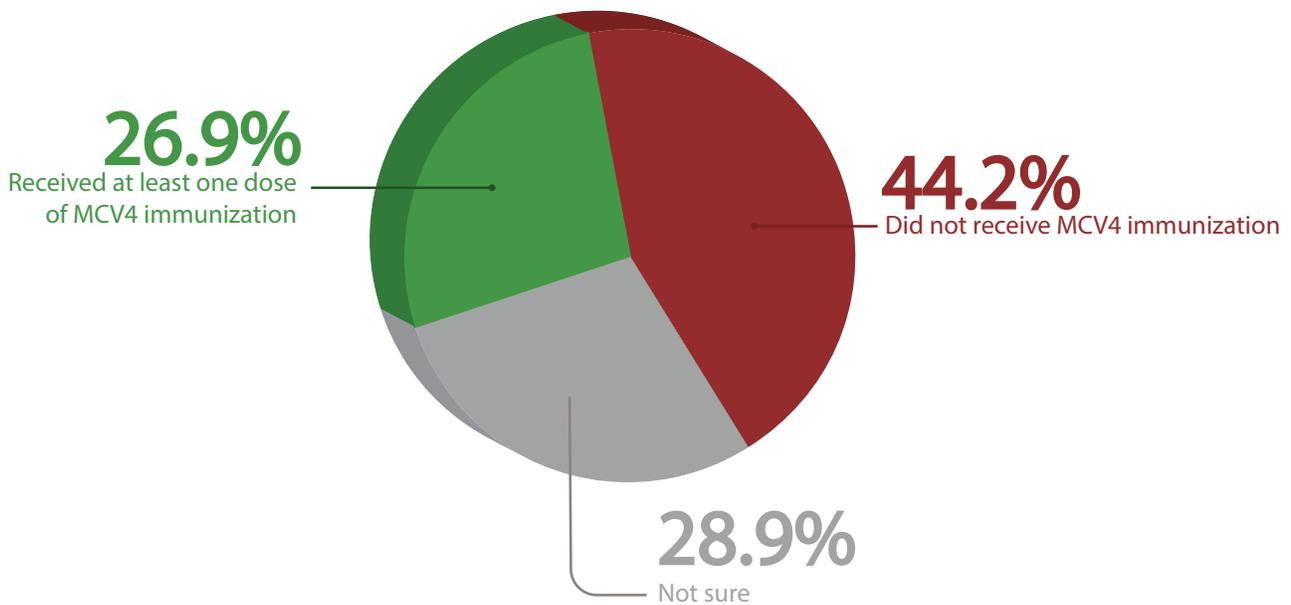
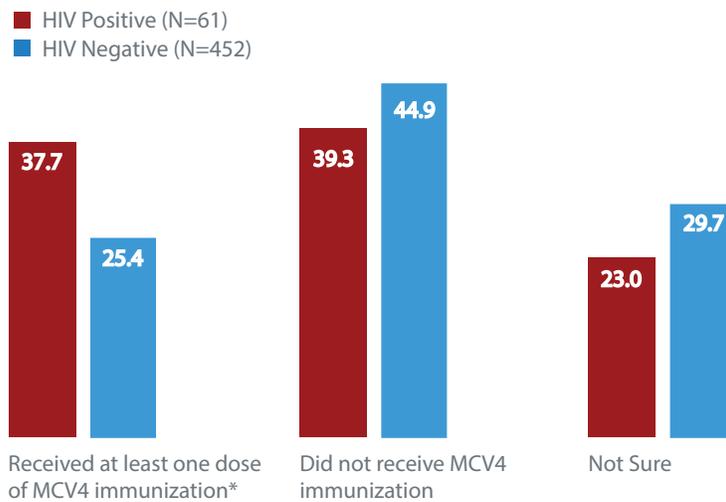


FIGURE 3. MCV4 Immunization Among Survey Respondents by HIV Status



*Chi-square p-value for comparing HIV serostatus by vaccination status is 0.04

Although reported vaccination remains low, a majority of respondents thought getting immunized for MCV4 was important, suggesting other vaccination barriers besides lack of concern. When asked about the importance of getting the MCV4 immunization, 73.8% of HIV-positive survey respondents and 55.8% of HIV-negative survey respondents responded that being vaccinated against meningococcal strains is an “important” priority. Respondents were provided the opportunity to identify reasons for why they chose to or did not choose to get vaccinated. Among those who were vaccinated, nearly two-thirds got vaccinated because they were following a physician’s recommendation (65.9%), and half were motivated by wanting to prevent disease (47.8%) and a desire to protect their community (47.1%) (See Table 2 for top 5 reasons why individuals got vaccinated). Among those that declined vaccination or were unsure of their vaccination status, over a third of survey respondents cited wanting to learn more about the vaccine (36.3%) or more about meningitis itself (25.3%) as a barrier to getting vaccinated (see Table 3 for top 5 reasons why individuals declined vaccination).

The majority of MSM sampled receive vaccinations at their primary care provider’s office. Nearly three-quarters (71.9%) of survey respondents receive recommended adult immunizations (not specifically the MCV4 immunization) at their primary care provider’s office, while the remaining respondents received vaccinations at community/public health clinics (17.2%), hospitals (5.3%), storefront clinics (2.7%), worksite health clinics (0.2%), and Other sites (1.7%). The remaining 1.0% of respondents declined to answer the question.

Many MSM living with HIV have not completed their MCV4 immunization primary series, and are therefore still vulnerable to IMD. In our sample, nearly one-third of HIV-positive survey respondents had not received their second dose of the MCV4 immunization. Among all respondents who received at least one dose, 82.6% of HIV-positive respondents were vaccinated within the last 6 months, while only 51.3% of HIV-negative respondents were vaccinated within the last 6 months.

TABLE 2. Top 5 Reasons for Getting the MCV4 Immunization (N=138)

Top Five Reasons for Getting the MCV4 Immunization	N	%
1. Doctor recommended the shots	91	65.9%
2. To prevent disease	66	47.8%
3. It protects the community	65	47.1%
4. Disease prevalence/outbreak in my area	49	35.5%
5. It's the "right" thing to do	46	33.3%

TABLE 3. Top 5 Reasons for Not Getting the MCV4 Immunization (N=375)*

Top Five Reasons for Not Getting the MCV4 Immunization	N	%
1. I want to learn more about the vaccine	136	36.3%
2. I want to learn more about meningitis itself	132	35.2%
3. I am not worried about getting meningitis	85	22.7%
4. I have not had the time to schedule an appointment to get the vaccine	50	13.3%
5. I worry that the vaccine has side effects	46	12.3%

*27.2% responded with "Other"

Policy Recommendations

This study is among the first to document MCV4 immunization rates among MSM in Southern California, where an IMD outbreak is currently ongoing. Findings suggest potential gaps in uptake, as well as directions for future public health efforts:

1. Meningococcal disease prevention campaigns targeting health care providers are needed to increase meningococcal disease awareness; address identified barriers and improve vaccine uptake by patients and those within their social networks.

Almost two-thirds of survey respondents who sought MCV4 immunization were following recommendations of their physician. This seems to indicate that efforts to train and educate health care providers have been effective and continue to be a key strategy to increase IMD awareness and MCV4 uptake among MSM, including MSM living with HIV. Information provided to patients must include more comprehensive information about IMD, MCV4 immunization, and appropriate dosing schedules. This is especially important for HIV-positive MSM and others who are immunocompromised, for whom two doses are required to achieve maximum vaccine efficacy. The high percentage of HIV-positive MSM vaccinated in the past 6 months (82.6%) suggest that campaigns by local health departments and community-based

organizations targeting HIV-positive MSM were potentially influential in promoting vaccination uptake and that a large number of men living with HIV are on track to receiving a second dose of MCV4. Evaluations of impact of LA DPH and collaborative community-based efforts are still in progress but may shed light on the efficacy of those efforts.

2. Targeted MCV4 outreach and education efforts to MSM must continue, with a particular focus on online education.

Despite active IMD immunization campaigns by the Los Angeles County Department of Public Health Immunization Program, AIDS Healthcare Foundation (AHF), APLA Health, the Los Angeles LGBT Center and others, large percentages of MSM in our sample had not been vaccinated (44.3%) or did not know whether they had been vaccinated (28.9%). Our study found that the vast majority of respondents are online (94.0% used at least one social media site in the past 30 days, and 82.2% said they use social networking sites at least daily) and use the internet to get health information: Nearly 60% (58.3%) used the internet to get vaccine information, and 46.6% used the internet to find locations to get immunized. These online venues provide prime opportunities for public health campaigns emphasizing the importance of MCV4 immunization for MSM and have already been leveraged to provide information regarding MCV4 immunization. While disease outbreaks can prompt enhanced vaccination efforts, public health agencies and community-based organizations should ensure that online and offline outreach regarding IMD and MCV4 immunization are ongoing.

3. MCV4 immunization access points must be available and expanded throughout the County at venues where MSM socialize. MCV4 immunization among MSM may be increased as opportunities for vaccination become more readily available in community venues that are already popular among MSM. Many local pharmacies offer MCV4 immunization. Cities such as West Hollywood and other neighborhoods with large concentrations of gay men may benefit from partnerships with these pharmacies that cover the cost of vaccination. One of the top reasons that participants who had been vaccinated cited for their decision was “to protect the community.” Gay communities have a long history of activism centered on public health issues. Tailoring messaging to emphasize the personal as well as altruistic benefits of MCV4 immunization may be particularly powerful among MSM. Immunization opportunities at gay bars and clubs may be an effective strategy for increasing uptake among MSM.

4. Collecting information on sexual practices in conjunction with vaccination will help to track MCV4 uptake, facilitate the assessment of local MCV4 coverage rates and inform future use of evidence-based immunization efforts. Currently, data regarding sexual practices (or sexual orientation) are not linked with vaccination data in immunization registries. While some health centers within community-based organizations that serve LGBT communities may collect these data regularly, most MSM indicate receiving their vaccinations through primary care providers. Coordinated efforts to standardize the collection of data on sexual practices in conjunction with immunization will enable better tracking of MCV4 uptake and support a data infrastructure for assessing local coverage rates for Los Angeles County. Integration of these data in medical records can assist health systems in easily identifying patients who are unvaccinated or have incomplete dosing and reach out to those patients in an effort to immunize against IMD before an outbreak occurs.

Limitations

Our survey was conducted at randomly selected venues, but sampling bias may still be present. Many of the surveys were conducted at bars or clubs in the evening, when participants may have been under the influence of substances. Precautions were taken not to survey those obviously under the influence, but our sample may not be representative of MSM in Los Angeles County as a whole. For instance, although the sample was ethnically diverse, the majority of the respondents were employed, insured and well educated. Future efforts to reach subgroups of MSM in non-traditional settings who may be socially and/or geographically isolated within Southern California would contribute to these findings and be beneficial

to on-going outreach campaigns. In addition, survey data rely on self-report and personal recall. Due to the “rapid response” nature of this project we were not able to implement third party verification of vaccination status. Future studies should seek to implement more stringent protocols to verify immunization status in collaboration with health care providers or with data from the California Immunization Registry (CAIR).

Conclusions

This study offers important insights into the facilitators and barriers of MCV4 uptake among MSM in Los Angeles, CA. Given the heightened risk of IMD during an ongoing outbreak that primarily affects MSM, we found that this at-risk population is not adequately protected against IMD infection. The majority of HIV-positive MSM who were vaccinated received a single dose within the past 6 months, which may indicate the impact of ongoing public health and community stakeholder efforts. Future interventions should focus on getting men living with HIV to complete the 2-dose MCV4 primary series. There are even greater challenges among HIV-negative MSM in terms of IMD awareness and uptake of MCV4. Vaccination promotion efforts must prioritize education and improving access within this community, and utilize effective and tailored promotion strategies to reach this population. Failure to address the barriers and challenges that inhibit MSM from receiving adequate MCV4 immunization will prolong this outbreak, resulting in more preventable deaths and lifelong impairments from IMD.

REFERENCES

1. California Department of Public Health. Meningococcal Disease Outbreak Information. 2017; <http://www.cdph.ca.gov/progimmunizerams/Pages/MeningococcalUpdates.aspx>. Accessed March 9, 2017.
2. Nanduri S. Outbreak of serogroup c meningococcal disease primarily affecting men who have sex with men Southern California, 2016. *MMWR. Morbidity and mortality weekly report*. 2016;65.
3. Centers for Disease Control. Meningococcal Disease. <https://www.cdc.gov/vaccines/pubs/pinkbook/downloads/mening.pdf>. Accessed March 9, 2017.
4. Centers for Disease Control. Chapter 2: Epidemiology of Meningitis Caused by Neisseria meningitides, Streptococcus pneumoniae, and the Haemophilus influenza. <https://www.cdc.gov/meningitis/lab-manual/chpt02-epi.html>. Accessed March 9, 2017
5. Schuster JE, O'Leary S, Kimberlin DW. Update From the Advisory Committee on Immunization Practices. *Journal of the Pediatric Infectious Diseases Society*. 2016;5(4):349-355.
6. MacNeil JR, Rubin LG, Patton M, Ortega-Sanchez I, Martin SW. Recommendations for Use of Meningococcal Conjugate Vaccines in HIV-Infected Persons – Advisory Committee on Immunization Practices, 2016. <https://www.cdc.gov/mmwr/volumes/65/wr/mm6543a3.htm>. Accessed March 9, 2017.
7. California Department of Public Health. CDPH issues health advisory for meningococcal disease. 2016; <http://www.cdph.ca.gov/Pages/NR16-037.aspx>. Accessed March 3, 2017.
8. Koch J, Hellenbrand W, Schink S, Wichmann O, Carganico A, Drewes J, Kruspe M, Suckau M, Claus H, Marcus U. Evaluation of a temporary vaccination recommendation in response to an outbreak of invasive meningococcal serogroup C disease in men who have sex with men in Berlin, 2013–2014. *Euro Surveill*. 2016;21(5):pii=30122. DOI: <http://dx.doi.org/10.2807/1560-7917.ES.2016.21.5.30122>
9. Aubert L, Taha MK, Boo N, Le Strat Y, Deghmane AE, Sanna A, Barret AS, Lévy-Bruhl D, Vandentorren S, Parent du Châtelet I. Serogroup C invasive meningococcal disease among men who have sex with men and in gay-oriented social venues in the Paris region: July 2013 to December 2014. *Euro Surveill*. 2015;20(3):pii=21016. Article DOI: <http://dx.doi.org/10.2807/1560-7917.ES2015.20.3.21016>
10. Blackwell CW. Knowledge of Vaccination Needs of HIV-Infected Men Who Have Sex with Men in a National Sample of “Gay Friendly” Health care Providers. *Public Health Nursing*. 2016;33(5).
11. Blackwell CW. Use of CDC Vaccine Schedules Smartphone Application to Prescribe Vaccines for HIV-Infected Adults. *Journal of the Association of Nurses in AIDS Care*. 2016;27(4):538-543.
12. Jamison K. Low Meningococcal Vaccine Completion Rates Among HIV-Infected Men-Who-Have-Sex-with-Men Attending New York City Sexually Transmitted Disease Clinics, 2012-2015. Paper presented at: 2016 National STD Prevention Conference.
13. Durham MD, Buchacz K, Armon C, et al. Seasonal influenza vaccination rates in the HIV outpatient study—United States, 1999–2013. *Clinical Infectious Diseases*. 2015;60(6):976-977.
14. Harrison N, Poepl W, Herkner H, et al. Predictors for and coverage of influenza vaccination among HIV-positive patients: a cross-sectional survey. *HIV medicine*. 2016.
15. Qualtrics (2017). Qualtrics. Retrieved from <http://www.qualtrics.com>