

UCLA

UCLA Previously Published Works

Title

Assessing willingness to test for HIV among men who have sex with men using conjoint analysis, evidence for uptake of the FDA-approved at-home HIV test

Permalink

<https://escholarship.org/uc/item/72m0h2gd>

Journal

AIDS Care, 25(12)

ISSN

0954-0121

Authors

Lee, Sung-Jae
Brooks, Ronald
Bolan, Robert K
et al.

Publication Date

2013-05-07

DOI

10.1080/09540121.2013.793272

Peer reviewed

This article was downloaded by: [Sung-Jae Lee]

On: 08 May 2013, At: 13:03

Publisher: Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



AIDS Care: Psychological and Socio-medical Aspects of AIDS/HIV

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/caic20>

Assessing willingness to test for HIV among men who have sex with men using conjoint analysis, evidence for uptake of the FDA-approved at-home HIV test

Sung-Jae Lee^a, Ronald Brooks^b, Robert K. Bolan^c & Risa Flynn^c

^a Department of Psychiatry and Biobehavioral Sciences, UCLA Semel Institute - Center for Community Health, Los Angeles, CA, USA

^b Department of Family Medicine, University of California, Los Angeles, CA, USA

^c LA Gay & Lesbian Center, Los Angeles, CA, USA

Published online: 07 May 2013.

To cite this article: Sung-Jae Lee, Ronald Brooks, Robert K. Bolan & Risa Flynn (2013): Assessing willingness to test for HIV among men who have sex with men using conjoint analysis, evidence for uptake of the FDA-approved at-home HIV test, AIDS Care: Psychological and Socio-medical Aspects of AIDS/HIV, DOI:10.1080/09540121.2013.793272

To link to this article: <http://dx.doi.org/10.1080/09540121.2013.793272>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.tandfonline.com/page/terms-and-conditions>

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae, and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand, or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

Assessing willingness to test for HIV among men who have sex with men using conjoint analysis, evidence for uptake of the FDA-approved at-home HIV test

Sung-Jae Lee^{a*}, Ronald Brooks^b, Robert K. Bolan^c and Risa Flynn^c

^aDepartment of Psychiatry and Biobehavioral Sciences, UCLA Semel Institute – Center for Community Health, Los Angeles, CA, USA; ^bDepartment of Family Medicine, University of California, Los Angeles, CA, USA; ^cLA Gay & Lesbian Center, Los Angeles, CA, USA

(Received 30 August 2012; final version received 30 March 2013)

Men who have sex with men (MSM) in the USA, represent a vulnerable population with lower rates of HIV testing. There are various specific attributes of HIV testing that may impact willingness to test (WTT) for HIV. Identifying specific attributes influencing patients' decisions around WTT for HIV is critical to ensure improved HIV testing uptake. This study examined WTT for HIV by using conjoint analysis, an innovative method for systematically estimating consumer preferences across discrete attributes. WTT for HIV was assessed across eight hypothetical HIV testing scenarios varying across seven dichotomous attributes: location (home vs. clinic), price (free vs. \$50), sample collection (finger prick vs. blood), timeliness of results (immediate vs. 1–2 weeks), privacy (anonymous vs. confidential), results given (by phone vs. in-person), and type of counseling (brochure vs. in-person). Seventy-five MSM were recruited from a community-based organization providing HIV testing services in Los Angeles to participate in conjoint analysis. WTT for HIV score was based on a 100-point scale. Scores ranged from 32.2 to 80.3 for eight hypothetical HIV testing scenarios. Price of HIV testing (free vs. \$50) had the highest impact on WTT (impact score = 31.4, SD = 29.2, $p < 0.0001$), followed by timeliness of results (immediate vs. 1–2 weeks) (impact score = 13.9, SD = 19.9, $p \leq 0.0001$) and testing location (home vs. clinic) (impact score = 10.3, SD = 22.8, $p = 0.0002$). Impacts of other HIV testing attributes were not significant. Conjoint analysis method enabled direct assessment of HIV testing preferences and identified specific attributes that significantly impact WTT for HIV among MSM. This method provided empirical evidence to support the potential uptake of the newly FDA-approved over-the-counter HIV home test kit with immediate results, with cautionary note on the cost of the kit.

Keywords: HIV home test; MSM; testing preferences

Introduction

HIV continues to exact a tremendous toll on men who have sex with men (MSM) in the USA. Surveillance reports from the Center for Disease Control and Prevention (CDC) indicate that MSM continue to comprise the largest number of new HIV infections. In 2009, MSM accounted for 61% of new HIV infections in the USA and 79% of infections among all newly infected men. Compared with other groups, MSM accounted for the largest numbers of new HIV infections in 2009 (CDC, 2012).

HIV testing remains core to the clinical management of HIV infection (CDC, 2011); however, it now plays an important role in HIV prevention, reflected in recent constructs such as “treatment as prevention” (Cohen & Gay, 2010) and other biomedical approaches to HIV prevention (Cohen, Shaw, McMichael, & Haynes, 2011; Grant et al., 2010). For MSM, the individual benefits of routine HIV testing and early entry into treatment have been well documented (Antiretroviral Therapy Cohort Collaboration, 2008;

CDC, 2006; Marks, Crepaz, & Janssen, 2006; Walensky, Freedberg, Weinstein, & Paltiel 2007). Increasing HIV testing among MSM remains central to reduce undiagnosed HIV infections and prevent new infections and decrease HIV-related morbidity (Chou, Huffman, Fu, Smits, & Korthuis, 2005; Frieden, Das-Douglas, Kellerman, & Henning, 2005). MSM who are unaware of their HIV infection may unknowingly continue to expose sex partners to HIV. In 2008, the CDC estimated that 44% of MSM were unaware of their HIV infection (CDC, 2012). CDC guidelines currently recommend HIV testing for sexually active MSM every three to six months as a means of preventing new infections (CDC, 2012). Unfortunately, data from the National HIV Behavioral Surveillance System indicate that only a small proportion of MSM adhere to the CDC recommended testing guidelines (CDC, 2011). Because persons often reduce their risk behaviors when they receive a diagnosis of HIV infection, and persons who do not know they are infected are estimated to

*Corresponding author. Email: sjlee@mednet.ucla.edu

account for more than half of sexually transmitted HIV infections (Marks et al., 2006), increasing the awareness of HIV infection through expanded testing and moving newly diagnosed MSM into care, will help reduce new HIV transmissions (CDC, 2011).

Prior research on HIV testing among MSM suggests that many reasons exist for the reduced willingness of MSM to get tested for HIV (Sharma, Sullivan, & Khosropur, 2011). The barriers to HIV testing among MSM may include: the fear of being diagnosed with HIV, denial of risk factors, clinic-related barriers, negative attitudes toward sex with HIV-positive men, and HIV related stigma, and the type of HIV testing being offered (Flowers, Knussen, Li, & McDaid, 2012; Greensides, Berkelman, Lansky, & Sullivan, 2003; Kellerman et al., 2002).

Identifying the specific attributes of the HIV test process that may influence willingness to test (WTT) for HIV among MSM is critical to ensuring the expanded uptake of HIV screening among this highly impacted population. Very specific attributes of the HIV testing procedure may impact WTT for HIV. For example, clinic-based testing may compromise one's privacy and contribute to HIV stigma (i.e., perceived as HIV-positive or engaging in behaviors that result in HIV acquisition); however, the results may be more immediate. Up until recently, current home-based testing would protect one's privacy and prevent feelings of stigma; however, the results would not be available immediately (1–2 weeks). Different HIV testing scenarios have different attributes that individuals may value when deciding whether or not to test for HIV.

This study utilized an innovative methodology, conjoint analysis, to assess WTT for HIV among MSM. Conjoint analysis, which has been used extensively in market research (Marshall & Bradlow, 2002) and has recently begun to be applied in health research (e.g., preferences for HIV testing, HIV vaccine acceptability) (Lee, Newman, Comulada, Cunningham, & Duan, 2012; Phillips, Maddala, & Johnson, 2002), is a *decompositional* approach to assessing consumer preferences (Green, & Srinivasan, 1978). Conjoint analysis calculates the relative importance of different product attributes (1) indirectly, by asking respondents to make choices about products, which is closer to the decisions they actually make in the real world; (2) in the context of specified ranges; and (3) by deciding on trade-offs (e.g., How likely would you be willing to test for HIV if the test is given at home, the cost is free, sample is collected by blood, results available in 1–2 weeks, results will be confidential, results given by phone, and counseling available in person?).

In our application of conjoint analysis with HIV testing scenarios as the target products, we describe a given HIV testing scenario as a bundle of seven dichotomous attributes. If asked about each attribute separately, individuals might state that all the HIV testing attributes are important. For example, a series of questions on each dichotomous testing attribute might result in individuals choosing the optimal level of each HIV testing attribute (e.g., tested at home, free, immediate results, etc.). Conjoint analysis enables us to determine the relative value individuals place on each of the attributes that make up the HIV testing scenario. Beyond yielding practical information about the relative importance of various HIV testing attributes in individual decisions about getting tested for HIV, conjoint analysis enables us to determine which HIV testing profiles (i.e., combination of HIV testing attributes) may maximize MSM's WTT for HIV. Through integrating data on the impact of the various testing attributes, one can derive the WTT score of each HIV testing scenario as rated by participants.

The Food and Drug Administration recently approved the OraQuick In-Home HIV Test (FDA, 2012), designed to allow consumers to collect an oral fluid sample by swabbing the upper and lower gums of the inside of their mouths, then place that sample into a developer vial, and obtain test results within 20 to 40 minutes (FDA, 2012). The goals of this study were to examine different attributes of HIV testing scenarios occurring in a gay-focused testing facility and identify specific attributes that have the highest impact in influencing WTT for HIV among MSM. In light of the recently FDA-approved at-home HIV test (FDA, 2012), the findings from this study could provide empirical evidence to support uptake of a home test among MSM.

Methods

Participants

From June 2011 to September 2011, 75 MSM aged 18 and over seeking HIV testing were recruited from the LA Gay & Lesbian Center (LAGLC) to participate in a one-time conjoint analysis exercise to gather information about their HIV testing preferences. Eligibility criteria included: at least 18 years of age, not an employee at the agency where the recruitment was taking place, and ability to read and understand English. Each participant was reimbursed US \$20 upon completion of the conjoint analysis activity. Given the anonymous nature of the study, only their ethnicity and age range were collected. All the sessions were conducted by a trained facilitator in a

Table 1. Experimental design for conjoint analysis to assess WTT for HIV among API MSM in Los Angeles.

HIV testing scenarios	Attributes						
	Location	Price	Sample collection	Timeliness of results	Privacy	Results given	Counseling
1	Clinic	Free	Blood	1–2 weeks	Confidential	By phone	Brochure with option to call
2	Home	Free	Blood	Immediate	Anonymous	By phone	Talk to a counselor
3	Clinic	\$50	Blood	Immediate	Confidential	In person	Talk to a counselor
4	Home	\$50	Blood	1–2 weeks	Anonymous	In person	Brochure with option to call
5	Clinic	Free	Prick finger	1–2 weeks	Anonymous	In person	Talk to a counselor
6	Home	Free	Prick finger	Immediate	Confidential	In person	Brochure with option to call
7	Clinic	\$50	Prick finger	Immediate	Anonymous	By phone	Brochure with option to call
8	Home	\$50	Prick finger	1–2 weeks	Confidential	By phone	Talk to a counselor

private office at LAGLC. The study was approved by the Institutional Review Board of the University of California, Los Angeles.

Assigning HIV testing attributes

Each hypothetical HIV testing scenario (conjoint) is a specific combination of seven dichotomous attributes. These attributes and values were determined based on existing research and data on current HIV testing methods (Greensides et al., 2003; Osmond et al., 2000; Phillips et al., 2002). The attribute profile for the eight HIV testing scenarios was generated using an 8-run Plackett – Burman design (Plackett & Burman, 1946), a fractional factorial design that allows efficient estimation for the main effects of the seven dichotomous attributes. Each row in Table 1 is an HIV testing scenario (numbered 1–8); each column is a testing attribute (e.g., location, price, and sample collection).

Conjoint scenario administration

Each participant was presented with eight different HIV testing scenarios described on laminated cards (see Table 1). Detailed instructions were given by the facilitator, and respondents were asked to compare the eight HIV testing scenarios and *rate* the HIV testing scenarios in terms of their WTT for HIV, recorded in five categories: “Highly likely,” “Somewhat likely,” “Neutral,” “Somewhat unlikely”, and “Highly unlikely.” The facilitator individually recorded each respondent’s ratings for each of the eight testing scenarios. The conjoint administration lasted about 20–30 minutes for each participant.

Data analysis

The WTT for HIV is derived by averaging individual WTT for HIV scores across respondents. For exam-

ple, the WTT for HIV for testing scenario 1 is the average of 75 respondents’ individual ratings of that testing scenario. Impact scores for each attribute on WTT for HIV, defined as amount determined by respondents regarding value that is associated with the HIV testing attributes at different levels, are estimated in two steps. In step 1, for each respondent, a multiple regression model is fit to their WTT for HIV scores Y_i for the eight hypothetical HIV testing scenarios, $i = 1, \dots, 8$; the seven HIV testing attributes A_p , $p = 1, \dots, 7$, serve as independent variables in the model, categorized as preferred (1) or not preferred (0). The mathematical representation of the model is:

$$Y_i = \beta_0 + \sum \beta_p A_p + \varepsilon_i,$$

where \sum is a summation over the seven regression coefficients β_p and attributes and ε_i is a residual error term. The regression coefficient for each HIV testing attribute (e.g., location) in the model is the impact score of the attribute on WTT for HIV for the individual respondent. Since all the independent variables are dichotomous, the mathematical representation of the impact score for each attribute simplifies to the net difference in mean WTT for HIV between the four hypothetical HIV testing scenarios with the preferred value and the four hypothetical HIV testing scenarios with the non-preferred value. For example, the impact of location is determined by taking the difference between the mean WTT for HIV of the four HIV testing scenarios with “home” as location and the mean WTT for HIV of the four HIV testing scenarios with “clinic” as the location. In step 2, we average the individual impact scores across respondents for each attribute; the average of these individual impact scores is the impact of that attribute (e.g., location) on overall WTT for HIV score. We use a one-sample *t*-test to determine the statistical significance of the impact of each attribute.

Results

Based on the demographics collected at the time of the conjoint administration, the ethnicity composition of our participants was as follows: 28 Caucasian (47.3%); 28 Latino (37.4%); 14 Asian (18.6%); and 5 African American (6.7%). The participants' reported age range breakdown was as follows: 12 between 18–25 years (16%); 50 between 26–35 years (66.7%); and 13 greater than 35 (17.3%).

Table 2 summarizes the WTT for HIV score among 75 MSM in the study. On a 100-point scale, we found a broad range of WTT scores across the eight hypothetical HIV testing scenarios, ranging from 32.22 (SD = 34.8) to 80.3 (SD = 26.4), with the higher score indicating preferred testing scenarios. The HIV testing scenarios with the highest WTT score had the following attribute profile: test given at home, free, blood collection, results available immediately, anonymous, results can be given by phone, and counseling given in-person by a counselor. The HIV testing scenario with the lowest WTT score had the following attribute profile: test given at home, costs \$50, blood collection, result available in 1–2 weeks, anonymous, results given in person, and counseling information on a brochure with an option to call.

Table 3 summarizes the impact of HIV testing attributes on WTT score. Out of the seven HIV testing attributes, only three attributes had a statistically significant impact on influencing MSM's decision to get tested for HIV. Price had the biggest impact (impact score = 31.4, SD = 29.2, $p < .0001$), followed by timeliness of results (impact score = 13.9, SD = 19.9, $p \leq 0.0001$) and location (impact score = 10.3, SD = 22.8, $p = .0002$). Impacts scores of other four attributes on WTT score were not statistically significant.

Discussion

Identifying attributes that may facilitate or impede uptake of HIV testing among MSM is critical for public health departments and community agencies seeking to expand testing efforts among an MSM population. We identified three factors that may impact WTT for HIV among MSM: price, timeliness of results and location. Based on our findings, a free HIV test administered at home with immediate results is the ideal candidate for increasing HIV testing among MSM, and suggests that potential uptake of the recently FDA-approved HIV home test.

A preference for immediate results from an HIV test, based on our conjoint analysis, is in line with the previous research examining HIV testing preferences of MSM. A recent study by Carballo-Diequez and colleagues identified a willingness of MSM to use an over-the-counter rapid HIV test at home to test themselves and sex partners (Carballo-Diequez, Frasca, Dolezal, & Balan, 2012). In addition, MacKellar and colleagues found a greater likelihood to use an over-the-counter rapid HIV testing among MSM that had never been previously tested (MacKellar et al., 2011). The immediacy of a rapid testing procedure reduces the likelihood of people not getting their results, particularly individuals who are HIV-positive.

The location where HIV testing occurs may diminish both WTT and frequency of testing among MSM. We identified a preference for home-based testing over a clinic setting. This preference was also observed in other MSM populations. For example, in Australia, MSM preferred home-based testing because it provided greater confidentiality, discretion, and privacy as compared to testing in a clinic setting (Chen et al., 2010). For MSM in the USA home-based testing may offer similar benefits, in addition to addressing other barriers such as geographic accessibility (i.e., distance to testing site). Leibowitz and

Table 2. Willingness to treat (WTT) for HIV scores among MSM in Los Angeles ($n = 75$).

Mean WTT score (SD)	Attributes						
	Location	Price	Sample collection	Timeliness of results	Privacy	Results given	Counseling
80.33 (26.4)	Home	Free	Blood	Immediate	Anonymous	By phone	Talk to a counselor
79.33 (22.7)	Home	Free	Prick finger	Immediate	Confidential	In person	Brochure with option to call
59.67 (33.6)	Clinic	Free	Blood	1–2 weeks	Confidential	By phone	Brochure with option to call
51.67 (35.7)	Clinic	Free	Prick finger	1–2 weeks	Anonymous	In person	Talk to a counselor
38.67 (31.9)	Clinic	\$50	Blood	Immediate	Confidential	In person	Talk to a counselor
37.67 (32.5)	Clinic	\$50	Prick finger	Immediate	Anonymous	By phone	Brochure with option to call
36.67 (36.1)	Home	\$50	Prick finger	1–2 weeks	Confidential	By phone	Talk to a counselor
32.33 (34.8)	Home	\$50	Blood	1–2 weeks	Anonymous	In person	Brochure with option to call

Note: SD, Standard deviation.

Table 3. Impact of testing attributes on WTT for HIV among MSM in Los Angeles ($n = 75$).

HIV testing attributes	Preferred value mean WTT ^a	Non-preferred value mean WTT ^b	Impact on WTT Mean (SD) ^c
Price	67.75	36.33	31.42 (29.2)*
Timeliness of results	59.00	45.08	13.91 (19.9)*
Location	57.17	46.92	10.25 (22.8)*
Results given	53.58	50.50	3.08 (20.2)
Counseling	52.25	51.83	0.42 (18.0)
Sample collection	51.33	52.75	-1.42 (22.2)
Privacy	50.50	53.58	-3.08 (18.3)

Notes: ^aMean WTT score for the 4 testing scenarios with the preferred value of each attribute.

^bMean WTT score for the 4 testing scenarios with the non-preferred value of each attribute.

^cImpact on WTT = difference in mean WTT score between 4 hypothetical testing scenarios with preferred value and the 4 hypothetical testing scenarios with non-preferred value.

SD: Standard deviation.

* $p < 0.05$ for the impact of testing attribute on mean WTT score, using one-sample t -test.

colleagues found that distance to HIV testing sites was associated with likelihood of ever being tested, particularly among low-income populations (Leibowitz, & Taylor, 2007).

Our findings are significant in light of the new at-home HIV test kit approved by the FDA (FDA, 2012). The OraQuick In-Home HIV Test is designed to allow consumers to collect an oral fluid sample by swabbing the upper and lower gums of the inside of their mouths, then place that sample into a developer vial, and obtain test results within 20 to 40 minutes (FDA, 2012). Our findings indicate that this over-the-counter test for HIV fulfills two of the three attributes that participants thought were important in their decision to get tested for HIV: testing at home and immediate results. The fact that an individual can collect an oral fluid sample at home and obtain the test results within 20–40 minutes in the privacy of their own home, makes consumer uptake likely for the newly approved home test.

However, our participants also emphasized that cost is an important issue in deciding whether they'll get tested for HIV. It remains to be seen how much uptake the home test kit will have if the kit is perceived to be too expensive. Free HIV testing offered at publicly funded test sites has been a mainstay of public health efforts to identify and track new HIV infections in local jurisdictions. Our findings indicate that cost is an attribute impacting willingness test for HIV. A free consumer-controlled

rapid HIV test could increase HIV testing among MSM. A high-priced test is likely to deter uptake and may also influence its reliability for detecting HIV infections. According to Paltiel and Pollack, the higher the price of a home test, the lower the HIV prevalence of the population purchasing the test; this will, in turn, impact the positive predictive value (i.e., ability to predict true positives among all positives) of the test (Paltiel & Pollack, 2010).

As in other studies, several limitations must be noted when interpreting the results of this study. First, the small sample size of our study limits the generalizability of the findings to other MSM populations. In addition, given the fact that our participants were recruited from an agency providing HIV testing, our sample might be biased in factor of those more willing to get tested for HIV. However, given that our main objective was to examine participants' preferences toward specific attributes that make up HIV testing scenarios, our sample recruited from a testing site may be acceptable. Second, omission of the oral swab as a means of sample collection in the hypothetical HIV testing scenarios limits our assessment of participants' preferences toward oral swabs. At the time of the study, the agency had stopped using oral swab for HIV screening due to some incidents of false positives. Despite this limitation, the findings of our study pointing to participants' preference toward being tested at home with more immediate test results, suggest that they would have preferred oral swab, compared to blood draw, if given that choice. Third, the lack of Spanish-speaking MSM in this study limits our generalizability to Spanish-speaking MSM. However, as a pilot study, it was not feasible to expand our study population beyond English-speaking MSM. Future studies should consider these limitations. Our study findings also underscore the need to future work to further examine the combination of other HIV testing attributes. For example, it would be worth examining factors like testing partners, using the test "on the go," and the acceptable price range they are willing to pay.

Expanding new HIV testing methods that are more acceptable to MSM may lead to a decrease in delayed HIV diagnosis and quicker access to care and treatment which is associated with improved health outcomes and decrease in HIV transmission. It is imperative that HIV testing technologies are designed to support and facilitate frequent testing among MSM at risk for HIV infection. Past studies have suggested that it may be acceptable to include home HIV testing as part of HIV prevention interventions for MSM (Sharma et al., 2011), and the OraQuick

In-Home HIV Test may potentially serve as an important tool.

However, there are also some cautionary notes to consider. First, as suggested by our study finding, the cost of the kit may play a significant role in the uptake of the test. If it is not priced appropriately, the kit may not reach the actual population that needs it the most. In addition, the assumption that the home test kit could provide quicker positive test result in the privacy of one's home and will lead to more timely linkage to care and treatment should be examined carefully. For instance, in lieu of an in-person counselor, Orasure Technologies, which makes the OraQuick test, has set up a toll-free 24/7 customer support center with bilingual reps (English-Spanish). Although they go through proper training to answer questions about HIV/AIDS, they are not certified counselors. Therefore, the option of talking to a counselor as part of the OraQuick kit may not be someone who can actually help link the individual into care and treatment. Third, another potential stumbling block is the "window period," or the time it takes (usually 12 weeks) for the body to develop antibodies that the test detects after exposure to HIV. This could give some people a "false sense of safety" that they are HIV-negative when they are in fact HIV-positive.

Despite these cautionary factors to consider, our findings support the potential uptake of the recently FDA-approved HIV home test kit. The approval of the new at-home test kit may serve as an important tool to improve HIV testing among MSM.

Acknowledgements

This work was supported by NIH grants MH58107, 5P30AI028697, and UL1TR000124, and 5K01MH085503. The content is solely the responsibility of the authors and does not necessarily represent the views of the NIH. We thank all individuals who participated in the study, as well as Alex Lee at UCLA and staff at LA Gay & Lesbian Center.

References

Antiretroviral Therapy Cohort Collaboration. (2008). Life expectancy of individuals on combination antiretroviral therapy in high-income countries: A collaborative analysis of 14 cohort studies. *The Lancet*, *372*, 293–299. doi:10.1016/S0140-6736(08)61345-8

Carballo-Diéguez, A., Frasca, T., Dolezal, C., & Balan, I. (2012). Will gay and bisexually active men at high risk of infection use over-the-counter rapid HIV tests to screen sexual partners? *Journal of Sex Research*, *49*(4), 379–387. doi:10.1080/00224499.2011.647117

Centers for Disease Control and Prevention. (2006). Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. *Morbidity and Mortality Weekly Report*, *55*(RR-14), 1–17. Retrieved from <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5514a1.htm>

Centers for Disease Control and Prevention. (2011). HIV testing among men who have sex with men – 21 cities, United States, 2008. *Morbidity and Mortality Weekly Report*, *60*(21), 694–699. Retrieved from <http://www.cdc.gov/mmwr/pdf/wk/mm6021.pdf>

Centers for Disease Control and Prevention. (2012). HIV among Gay and Bisexual Men. Retrieved from <http://www.cdc.gov/hiv/topics/msm/pdf/msm.pdf>.

Chou, R., Huffman, L. H., Fu, R., Smits, A. K., & Korthuis, P. T. (2005). Screening for HIV: A review of the evidence for the U.S. preventive services task force. *Annals of Internal Medicine*, *143*(1), 55–73. doi:10.7326/0003-4819-143-1-200507050-00010

Cohen, M. S., & Gay, C. L. (2010). Treatment to prevent transmission of HIV-1. *Clinical Infectious Diseases*, *50*(Suppl. 3), S85–S95. doi:10.1086/651478

Cohen, M. S., Shaw, G. M., McMichael, A. J., & Haynes, B. F. (2011). Acute HIV-1 Infection. *The New England Journal of Medicine*, *364*(20), 1943–1954. doi:10.1056/NEJMr1011874

Flowers, P., Knussen, C., Li, J., & McDaid, L. (2012). Has testing been normalized? An analysis of changes in barriers to HIV testing among men who have sex with men between 2000 and 2010 in Scotland, UK. *HIV Medicine*, *14*(2), 92–98. doi: 10.1111/j.1468-1293.2012.01041.x

Food and Drug Administration. (2012). FDA approves first over-the-counter home-use rapid HIV test. FDA News Release Retrieved from <http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm310542.htm>

Frieden, T. R., Das-Douglas, M., Kellerman, S. E., & Henning, K. J. (2005). Applying public health principles to the HIV epidemic. *The New England Journal of Medicine*, *353*(22), 2397–2402. doi:10.1056/NEJMs053133

Grant, R. M., Lama, J. R., Anderson, P. L., McMahan, V., Liu, A. Y., Vargas, L., . . . iPrEX Study Team. (2010). Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. *The New England Journal of Medicine*, *363*(27), 2587–2599. doi:10.1056/NEJMoa1011205

Green, P. E., & Srinivasan, V. (1978). Conjoint analysis in consumer research: Issues and outlook. *Journal of Consumer Research*, *5*(2), 103–123. doi:10.1086/208721

Greensides, D. R., Berkelman, R., Lansky, A., & Sullivan, P. S. (2003). Alternative HIV testing methods among populations at high risk for HIV infection. *Public Health Reports*, *118*, 531–539. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1497600/pdf/14563910.pdf>

Kellerman, S., Lehman, J. S., Lansky, A., Stevens, M. R., Hecht, F. M., Bindman, A. B., & Wortley, P. M. (2002). HIV testing within at-risk populations in the United

- States and the reasons for seeking or avoiding HIV testing. *Journal of Acquired Immune Deficiency Syndromes*, 31, 202–210. doi:10.1097/01.QAI.0000024005.76120.97
- Lee, S. J., Newman, P. A., Comulada, W. S., Cunningham, W. E., & Duan, N. (2012). Use of conjoint analysis to assess HIV vaccine acceptability in three diverse communities: Feasibility of an innovation in the assessment of consumer healthcare preferences. *International Journal of STD and AIDS*, 23(4), 235–241. doi:10.1258/ijasa.2011.011189
- Leibowitz, A., & Taylor, S. L. (2007). Distance to public test sites and HIV testing. *Medical care research and review*, 64(5), 568–584. doi:10.1177/1077558707304634
- Mackellar, D. A., Hou, S. I., Whalen, C., Samuelsen, K., Sanchez, T., Smith, A., ... WHBS Study Group. (2011). Reasons for not HIV testing, testing intentions, and potential use of an over-the-counter rapid HIV test in an internet sample of men who have sex with men who have never tested for HIV. *Sexually Transmitted Diseases*, 38(5), 419–428. doi:10.1097/OLQ.0b013e31820369dd
- Marks, G., Crepaz, N., & Janssen, R. (2006). Estimating sexual transmission of HIV from persons aware and unaware that they are infected with the virus in the United States. *AIDS*, 20(10), 1447–1450. doi:10.1097/01.aids.0000233579.79714.8d
- Marshall, P., & Bradlow, E. T. (2002). A unified approach to conjoint analysis models. *Journal of the American Statistical Association*, 97(459), 674–682. doi:10.1198/016214502388618410
- Osmond, D., Catania, J., Pollack, L., Canchola, J., Jaffe, D., MacKellar, D., & Valleroy, L. (2000). Obtaining HIV test results with a home collection test kit in a community telephone sample. *Journal of Acquired Immune Deficiency Syndromes*, 24, 363–368.
- Paltiel, D. A., & Pollack, H. A. (2010). Price, performance, and the FDA approval process: The example of home HIV testing. *Medical Decision Making*, 30(2), 217–223. doi:10.1177/0272989X09334420
- Phillips, K. A., Maddala, T., & Johnson, F. R. (2002). Measuring preferences for health care interventions using conjoint analysis: an application to HIV testing. *Health Services Research*, 37(6), 1681–1705. doi:10.1111/1475-6773.01115
- Plackett, R. L., & Burman, J. P. (1946). The design of optimum multifactorial experiments. *Biometrika*, 33(4), 305–325. doi:10.1093/biomet/33.4.305
- Sharma, A., Sullivan, P. S., & Khosropour, C. M. (2011). Willingness to take a free anonymous home HIV test and associated factors among internet-using men who have sex with men. *Journal of the International Association of Physicians in AIDS Care*, 10(6), 357–364. doi:10.1177/1545109711404946
- Walensky, R. P., Freedberg, K. A., Weinstein, M. C., & Paltiel, A. D. (2007). Cost-effectiveness of HIV testing and treatment in the United States. *Clinical Infectious Diseases*, 45(Suppl. 4), S248–S254. doi:10.1086/522546