

Prevalence of Treatment Optimism-Related Risk Behavior and Associated Factors among Men Who Have Sex with Men in 11 States, 2000–2001

Patrick S. Sullivan · Amy J. Drake · Travis H. Sanchez

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Abstract Sustainable behavior change among men who have sex with men (MSM) may be threatened by optimistic beliefs about HIV treatments: treatment optimism has been associated with high risk sexual behaviors. We used data from behavioral surveys of MSM attending gay bars in 11 states from 2000–2001 to describe the prevalence and correlates of being less careful with sex or drugs because of treatment optimism (optimism-related risk behavior). Fifteen percent of 1477 HIV-negative or -untested MSM reported optimism-related risk behavior. Optimism-related risk behavior was reported more often by Black and Hispanic MSM (versus white), more often by MSM with a high school education or less (versus college), and less often by MSM in some states. HIV prevention programs should address treatment optimism and related behavioral risks by providing culturally appropriate information, accessible to MSM with lower educational attainment, about the limitations of current therapies.

Keywords HIV · Treatment optimism · HAART · Unprotected anal intercourse

Introduction

New challenges to HIV prevention have arisen since the availability of highly active antiretroviral therapy (HAART) and associated improvements in control of viral load and survival (Wolitski, Valdiserri, Denning, & Levine, 2001; Valdiserri, 2004). Recent outbreaks of sexually transmit-

ted diseases among MSM in several US cities (Williams et al., 1999; Fox et al., 2001; Chen, Kodagoda, Lawrence, & Kerndt, 2002; CDC, 2002; Ciesielski, 2003) and information gathered from behavioral surveys (Wolitski et al., 2001; Elford, Bolding, & Sherr, 2002; Ciesielski, 2003) indicate increases in sexual behaviors which place MSM at risk for HIV infection. Annual new diagnoses of HIV infections among MSM have increased each year since 2000 in 33 US states with confidential name-based HIV infection reporting systems (CDC, 2004a).

The reasons for increased risk behaviors among MSM are not clear, are certainly complex, and are likely multifactorial. Beliefs about HIV, specifically beliefs about susceptibility to infection (Halkitis, Zade, Shrem, & Marmor, 2004) and severity of HIV infection (Morin et al., 2003), may predict the adoption of preventive behaviors. In the HIV epidemic, the period since the advent of HAART has been marked by changes in beliefs within the gay community that bear directly on these two component beliefs (Valdiserri, 2004). For example, men may believe that HAART reduces the likelihood that an HIV-infected sex partner will transmit HIV, or may believe that the severity of HIV infection is less because of the availability of HAART.

Optimistic beliefs based on the availability of HAART have been associated with high risk sex behaviors in many studies (Kelly, Hoffman, Rompa, & Gray, 1998; Remien, Wagner, Carballo-Diequez, & Dolezal, 1998; Kalichman, Nachimson, Cherry, & Williams, 1998; Vanable, Ostrow, McKirnan, Taywaditep, & Hope, 2000; Huebner & Gerend, 2001; Ostrow et al., 2002; Elford et al., 2002; Van de Ven et al., 2002; International Collaboration on HIV Optimism, 2003; Williamson & Hart, 2004; Huebner, Rebchook, & Kegeles, 2004; Stolte, Dukers, Geskus, Coutinho, & de Wit, 2004), and these associations have reported to be significant in a recent meta-analysis (Crepaz, Hart, & Marks, 2004).

P. S. Sullivan (✉) · A. J. Drake · T. H. Sanchez
Centers for Disease Control and Prevention,
1600 Clifton Road, MS E-46, Atlanta, Georgia 30333
e-mail: pss0@cdc.gov

Thus, treatment optimism is related directly to HIV acquisition behaviors, and understanding risk behaviors associated with treatment optimism is of interest in planning prevention programs for MSM.

We used data from a series of behavioral surveys of MSM conducted in 2000 and 2001 in 27 US cities to evaluate the prevalence of being less careful with sex and drugs because of the availability of HAART (optimism-related risk behavior), and to describe demographic factors associated with optimism-related risk behavior.

Method

Participants and procedures

The HIV Testing Survey (HITS) was an anonymous cross-sectional survey designed primarily to monitor HIV testing behaviors, and conducted in the United States several times since 1996. Our data come from the study years 2000 (HITS-2000) and 2001 (HITS-2001). HITS methods have been previously described (Kellerman et al., 2002; CDC, 2003, 2004b). Briefly, HITS study staff surveyed men in gay bars in a total of 27 cities in 2000 (Kansas, Texas, Illinois, Florida, Nevada, New York, and Washington) and 2001 (California, Louisiana, Pennsylvania, and Vermont). The states were chosen based on a competitive application process; within each state, cities were chosen to include one major metropolitan area, and one smaller metropolitan area. The aim was to recruit at least 100 MSM in each state, using consistent recruitment methods.

Study staff recruited men at gay bars. Bars were selected through a structured formative research process. Formative research identified bars where MSM, typical of those at risk for HIV infection in the community, could be recruited. The formative research process included review of secondary data, including HIV surveillance data and information from local HIV prevention programs; interviews with key informants from community based organizations and bar owners; and ascertainment of potential venues by reviewing gay publications and community directories. In each city, a set of bars was selected to include diverse subgroups of MSM that would reflect the race/ethnicity and age of MSM at risk for HIV in that city.

At selected bars, trained recruiters approached men using a systematic sampling method, such that every n th man who passed a certain point in the venue was approached and offered participation in the survey. In most sites, a monetary incentive was offered to men who agreed to participate. The maximum amount of the incentive was \$25; sites had the ability to decrease the amount of the incentive, or to offer it as a non-monetary incentive (e.g., a gift card to a grocery store or pharmacy, a telephone card, or a voucher for movie

tickets). Local IRB review of the incentive structure provided a mechanism to ensure that, in the context of each local project, the incentive was not coercive.

To be interviewed, men had to be at least 18 years of age, had to reside for at least 6 months in the state in which the interview was conducted, and had to provide informed consent. In our analysis, only data from MSM who did not report being HIV infected were included.

Measures

Men who provided consent were administered an anonymous, structured interview by trained study staff, in a private space whenever possible. No personal identifiers were collected. The interview obtained information about the participant's HIV testing history, demographic background, and sexual and drug use behaviors.

Participants were asked whether they *strongly agreed*, *mildly agreed*, *mildly disagreed*, or *strongly disagreed* with the following statement: "You are less careful about being safe with sex and drugs than you were 5 years ago because there are better treatments for HIV now". The five-year comparison period was chosen to reflect a time period before HAART was in broad use.

Participants were also asked about their recent sex and drug use behaviors. We asked men who reported having sex with another man in the year before the interview about their behaviors the last time they had sex, including whether they had receptive anal intercourse, whether their partner for anal intercourse used a condom, and the HIV status of their partner. For men who reported injecting drugs in the year before the interview, we asked whether they had shared needles during this time period.

Data analyses

This was a secondary analysis of HITS data, and was conducted as an exploratory analysis. Testing of *a priori* hypotheses was not conducted; rather, we set out to describe the prevalence of optimism-related risk behavior and demographic correlates.

To describe the prevalence of optimism-related risk behavior, men who strongly or mildly agreed with the statement about being less careful were considered to endorse optimism-related risk behavior. The number of men who reported optimism-related risk behavior was expressed as a proportion of all men who had sex with another man in the prior year.

To describe demographic correlates, we calculated univariate odds ratios to describe the association of optimism-related risk behavior with a variety of demographic factors, some of which had been previously proposed to be associated with treatment optimism (race, age, education,

HIV testing status, and state of interview; Remien et al., 1998; Ostrow et al., 2002; Elford et al., 2002; Stolte & Dukers, 2003; Williamson & Hart, 2004; Huebner et al., 2004). We then entered all of the demographics factors tested for univariate associations into a multivariable model, and report adjusted odds ratios with 95% confidence intervals.

We used data on reported sex and drug use behaviors to validate whether men who reported optimism-related risk behavior also reported higher levels of behavioral risks. We created a sexual risk hierarchy to describe four levels of recent sexual risk for HIV acquisition, based on behaviors reported during the last time the respondent had sex. Participants who had not had receptive anal intercourse (RAI) at last sex were classified as having the lowest recent HIV acquisition risk. Respondents who had RAI with a condom and those who had RAI without a condom with a partner believed to be HIV-negative comprised the second and third levels of risk. Finally, those who had RAI without a condom with a partner of positive or unknown HIV status represented the highest risk category.

Similarly, we classified those MSM who had injected drugs in the 12 months before the interview as having more risky behavior (having shared needles in the 12 months before the interview), versus having less risky behavior (having injected in the 12 months before the interview, but not having shared needles).

To evaluate the aspect of our measure related to being “less careful with sex or drugs”, we calculated odds ratios and 95% confidence intervals to describe the odds of high risk sex (referent group: men who had a male sex partner in the past 12 months, but did not report receptive anal intercourse at last sex) or injection behaviors (referent group: men who injected drugs, but did not share needles in the past 12 months) among those who reported optimism-related risk behavior, compared with those who did not report optimism-related risk behavior.

Results

In total, 3897 men were approached in the study during the period 2000–2001 (Fig. 1). Of these, 952 (24%) refused the approach and 396 (10%) were aged less than 18 years or were not a resident of the state, and were therefore not offered interview. Of the 2549 men who were offered interview, 1995 (78%) completed the interview, 22 (1%) started the interview but did not complete it, and 532 (21%) refused the interview. Completion rate among men not known to be ineligible, including those who refused the initial approach, was 57%.

Among those who completed the survey, some were not included in this analysis because they reported being HIV

infected ($n = 241$), were ineligible because they reported an ineligible residence during the interview ($n = 50$), did not report their gender as male during the interview ($n = 28$), or did not respond to all of the questions used as independent variables in our analysis ($n = 21$). A total of 1477 (89% of all interviewed eligible men who did not report being HIV infected) reported having had sex with another man in the year before the interview and were included in the analysis.

The characteristics of men included in the analysis are shown in Table 1. The plurality of men were aged 18–29 years. Most men were white, non-Hispanic, had attained at least some college, and had been tested for HIV infection at least once. Forty percent of the men reported RAI at last sex; about half of those men had used a condom. Overall, 228 (15%) men reported optimism-related risk behavior.

In multivariate analysis (Table 1), optimism-related risk behavior was more commonly reported by Black and Hispanic men, and by men whose educational attainment was high school or less. There was some variation among states in the extent to which optimism-related risk behavior was reported; in all 4 states where optimism-related risk behavior was less commonly reported, interviews were conducted in 2000.

Reporting optimism-related risk behavior was significantly associated with reporting high-risk sexual behavior at last sex. MSM who reported optimism-related risk behavior were more likely to report RAI at last sex without a condom with a partner believed to be HIV-negative (unadjusted odds ratio (uOR), 1.6; 95% CI, 1.1–2.3) and more likely to report RAI without a condom with a partner who was believed to be HIV-infected, or whose HIV status was unknown (uOR 2.6, CI 1.4–4.8).

Only 24 MSM reported injecting drugs in the 12 months before the interview. Of these, 5 of 24 reported optimism-related risk behavior; 4 of these 5 (80%) reported sharing needles in the 12 months before the interview. In contrast, 9 of 19 MSM who did not report optimism-related risk behavior had shared needles (uOR = 4.4, CI 0.5–31.2)

Discussion

We found that nearly one in six MSM in our survey reported being less careful with sex or drugs because of treatment optimism. We report that Black and Hispanic men and men with less education were more likely to report optimism-related risk behavior. Other researchers had previously reported an association between treatment optimism and race/ethnicity and lower educational attainment among HIV-positive MSM (Holmes & Pace, 2002); our study extends those findings because we measured the association in HIV-negative men in diverse US states, and because we asked optimism-related

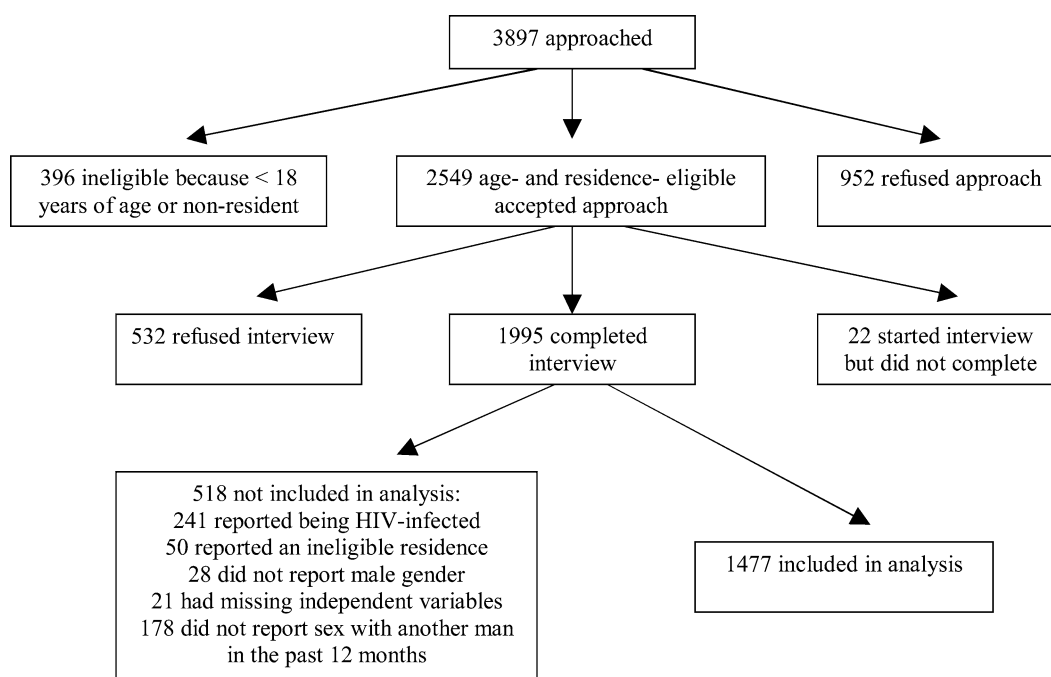


Fig. 1 Figurative depiction of the numbers of men who were approached in gay bars for interviews as part of the HIV Testing Survey, who completed interviews, and who were included in an analysis of treatment optimism-associated risk behaviors, 11 US states, 2000–2001

risk behavior, rather than about treatment optimism independent of risk behavior.

Respondents in four states (Florida, Kansas, Nevada, and New York) were less likely to report optimism-related risk behavior. Although sites used a consistent process of formative research for selection of bars where men were recruited, the differences by state may represent differences in the types of bars in these states. It is noteworthy that all of the sites where men were less likely to report optimism-related risk behavior participated in 2000, and the referent state (California) conducted interviews in 2001. Thus, state may be a proxy for year of interview. Alternatively, the extent to which men report optimism-related risk behavior may vary in different states.

Our analysis has some important limitations: representativeness, methodologic limitations of our measure of optimism-related behavioral risk, and certain potential biases. Although we interviewed men in 11 US states that represented both high- and low-HIV morbidity areas, the men in our sample are not representative of MSM in the United States, or in the participating states.

Further, we used a single question to measure being less careful because of treatment optimism, whereas previously reported studies have generally used multiple item scales to measure treatment optimism (Kalichman et al., 1998; Vanable et al., 2000; Huebner & Gerend, 2001; Ostrow et al., 2002; Koblin et al., 2003; International Collaboration on HIV Optimism, 2003; Stolte & Dukers, 2003; Vanable, Ostrow, & McKirnan, 2003; Huebner et al., 2004). The HITS survey

was designed in 1999, before many of the more sophisticated, multi-item scales had been reported in the medical literature. The HITS survey instrument was primarily designed to measure HIV testing behaviors, and had limited space for collection of data on HIV-related beliefs.

We evaluated our question about being less careful because of treatment optimism, and found a significant association of reporting being less careful and reporting high risk sex. We were not able to validate the second part of the compound statement (treatment optimism). Using behaviors at last sex to evaluate our measure would be expected to decrease recall bias compared to asking about behaviors in the past year, because it would reduce the time interval for recall for most men. However, this approach would also decrease sensitivity of our measure of high risk sex, because men who had high risk sex recently, but not at the time of last sex, would be classified as not reporting high risk sex. Very few MSM in our survey reported injection drug use, and the HITS survey did not include questions to evaluate other behaviors that men may have considered as being less careful with drugs—for example, drug use before or during sex.

Recent studies have reported the prevalence of treatment optimism (variously defined) among HIV-negative MSM to be 3–25% (Kelly et al., 1998; Remien et al., 1998; Vanable et al., 2000; Elford et al., 2002; Koblin et al., 2003; Williamson & Hart, 2004; Halkitis et al., 2004). In most surveys, holding optimistic views about HIV treatments has been associated with high risk behaviors among

Table 1 Demographic Factors Associated with Being Less Careful with Sex or Drugs Because of Treatment Optimism Among 1477 Men who have Sex with Men, Interviewed in Gay Bars in 11 US States, 2000–2001

Characteristic	Total men <i>N</i> (%)	Less careful because of treatment optimism ^a <i>n</i> (%)	Univariate odds ratio (95% CI)	Multivariate adjusted odds ratio (95% CI)
Race/ethnicity				
White, non-Hispanic	854 (58)	109 (13)	Referent	Referent
Black, non-Hispanic	212 (14)	46 (22)	1.9 (1.3–2.8)	1.8 (1.2–2.7)
Hispanic	207 (14)	44 (21)	1.8 (1.3–2.7)	1.9 (1.3–2.9)
Other races ^b	204 (14)	29 (14)	1.1 (0.7–1.8)	1.1 (0.7–1.7)
Age (years)				
18–29	606 (41)	99 (16)	1.1 (0.9–1.5)	1.0 (0.7–1.4)
30–39	543 (37)	81 (15)	Referent	Referent
≥ 40	328 (22)	48 (15)	1.0 (0.7–1.4)	1.0 (0.7–1.6)
Education				
≤ High school	325 (22)	74 (23)	2.1 (1.6–2.8)	1.8 (1.3–2.5)
At least some college	1152 (78)	154 (13)	Referent	Referent
HIV Testing Status				
Tested, HIV-negative	1285 (87)	193 (15)	Referent	Referent
Untested or unknown result	192 (13)	35 (18)	1.3 (0.8–1.9)	1.1 (0.7–1.7)
State of interview				
California	358 (24)	71 (20)	Referent	
Florida	164 (11)	6 (4)	0.2 (0.1–0.4)	0.2 (0.1–0.4)
Illinois	120 (8)	21 (18)	0.9 (0.6–1.4)	1.0 (0.6–1.8)
Kansas	85 (6)	5 (6)	0.3 (0.1–0.7)	0.3 (0.1–0.7)
Louisiana	96 (6)	21 (22)	1.1 (0.7–1.7)	0.9 (0.5–1.7)
Nevada	63 (4)	4 (6)	0.3 (0.1–0.8)	0.3 (0.1–0.8)
New York	288 (19)	39 (14)	0.7 (0.5–1.0) ^c	0.6 (0.4–0.9)
Pennsylvania	101 (7)	14 (14)	0.8 (0.4–1.2)	0.7 (0.4–1.3)
Texas	67 (5)	17 (25)	1.3 (0.8–2.0)	1.3 (0.7–2.5)
Vermont	59 (4)	15 (25)	1.3 (0.8–2.1)	1.7 (0.9–3.2)
Washington	76 (5)	15 (20)	1.0 (0.6–1.6)	1.2 (0.6–2.2)
Total	1477	228 (15)		

CI: confidence interval.

^aBeing less careful with sex and drugs because of treatment optimism was defined by strongly or mildly agreeing with the statement, “You are less careful about being safe with sex and drugs than you were 5 years ago because there are better treatments for HIV now”.

^bOther races include American Indian/Alaska Native, Asian/Pacific Islander, and those who reported multiple races.

^c95% confidence interval excludes 1.0, but is rounded to 1.0.

HIV-negative MSM (Kelly et al., 1998; Remien et al., 1998; Kalichman et al., 1998; Vanable et al., 2000; Huebner & Gerend, 2001; Ostrow et al., 2002; Elford et al., 2002; Van de Ven, Rawstorne, Nakamura, Crawford, & Kippax, 2002; International Collaboration on HIV Optimism, 2003; Stolte & Dukers, 2003; Williamson & Hart, 2004; Huebner et al., 2004; Stolte et al., 2004; Halkitis et al., 2004). One previous study among young MSM in the United States (Koblin et al., 2003), and work in Australia (Van de Ven, Prestage, French, Knox, & Kippax, 1998) did not find such an association.

It is difficult to directly compare our measurement of optimism-related risk behavior to previous work. Most other researchers measured treatment optimism, and then attempted to correlate treatment optimism with high risk behaviors. We asked respondents whether they were less careful with sex or drug use partners because of treatment optimism. It is unclear whether men who were treatment optimistic, but

did not engage in high risk behaviors because of that optimism, would have endorsed our measure of optimism-related risk behavior.

Our measure of being less careful explicitly asked about a causal relationship between treatment optimism and being less careful with sex or drugs. We may have failed to identify MSM who were less careful and treatment optimistic, but for whom the relationship was not causal. This problem is not trivial, because Huebner et al. (2004) measured treatment optimism and high risk behaviors in a longitudinal fashion, and concluded that treatment optimism did not predict subsequent high risk sex, but that high risk sex did predict subsequent treatment optimism. This finding was supported by data from a cross-sectional survey of gay and bisexual men, in which perception of susceptibility mediated the relationship between high risk behaviors and optimistic beliefs (Huebner & Gerend, 2001). In contrast,

Stolte et al. (2004) found that reduced perception of HIV threat at baseline was associated with subsequent high risk behaviors.

Our results were subject to certain biases (Sackett, 1979). Responses were subject to recall bias, because our question asked respondents to compare the extent to which they were careful about sex and drugs at the time of interview, to the extent to which they were careful 5 years earlier, and were asked about sexual activity and drug use in the 12 months before the interview. Social desirability bias may have led men to deny being less careful, which would result in decreased estimates of optimism-related behavioral risk. There may also be misclassification of optimism status. We used a compound statement to assess optimism-related risk behavior. Some men who were less careful, but not because of HAART, may have affirmed the statement; some men who had no change in carefulness, but who were optimistic because of HAART, may have affirmed the statement as well. Finally, we may have had significant non-response bias given our completion rate of 57%. Because we did not collect data from men who refused our approach or declined interview, we cannot describe how those men who refused were different from men who responded to the survey.

Despite the limitations of our secondary analysis of HITS data, our reported associations between a number of sociodemographic variables and the risk-optimism behavior outcome are similar to those reported in previous studies. This consistency across studies suggests the need for further, qualitative work to determine the reasons that Black and Hispanic men, as well as men with less education, were more likely to report being less careful with sex or drugs because of treatment optimism. This work should focus on whether these groups of men had received information about the limitations of current treatments, and focus on ways to improve the cultural competency of future educational and prevention materials (Resnicow, Baranowski, Ahluwalia, & Braithwaite, 1999). For example, Black and Hispanic MSM interviewed in focus groups in California called for prevention messages tailored to their communities (Morin et al., 2003).

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References

- Centers for Disease Control and Prevention (2002). Primary and secondary syphilis among men who have sex with men—New York City, 2001. *Morbidity and Mortality Weekly Report*, 51, 853–856.
- Centers for Disease Control and Prevention (2003). *HIV/AIDS Special Surveillance Report*, 2003; Vol 1(No. 1):1–27. [Special surveillance report], URL <http://www.cdc.gov/hiv/stats/special-reportVol1No1.htm>.
- Centers for Disease Control and Prevention (2004a). *HIV/AIDS Surveillance Report, 2003 (Vol. 15)*. [Surveillance report], URL <http://www.cdc.gov/hiv/stats/hasrlink.htm>.
- Centers for Disease Control and Prevention (2004b). *HIV Testing Survey, 2001; Special Surveillance Report Number 1:1–28*. [Special surveillance report], URL <http://www.cdc.gov/hiv/stats/special-reportVol2.htm>.
- Chen, J. L., Kodagoda, D., Lawrence, A. M., & Kerndt, P. R. (2002). Rapid public health interventions in response to an outbreak of syphilis in Los Angeles. *Sexually Transmitted Diseases*, 29, 277–284.
- Ciesielski, C. A. (2003). Sexually transmitted diseases in men who have sex with men: An epidemiologic review. *Current Infectious Disease Reports*, 5, 145–152.
- Crepaz, N., Hart, T. A., & Marks, G. (2004). Highly active antiretroviral therapy and sexual risk behavior: a meta-analytic review. *Journal of the American Medical Association*, 292, 224–236.
- Elford, J., Bolding, G., & Sherr, L. (2002). High-risk sexual behaviour increases among London gay men between 1998 and 2001: what is the role of HIV optimism? *AIDS*, 16, 1537–1544.
- Fox, K. K., del Rio, C., Holmes, K. K., Hook, E. W., Judson, F. N., Knapp, J. S., et al. (2001). Gonorrhea in the HIV era: a reversal in trends among men who have sex with men. *American Journal of Public Health*, 91, 959–964.
- Halkitis, P. N., Zade, D. D., Shrem, M., & Marmor, M. (2004). Beliefs about HIV non-infection and risky sexual behavior among MSM. *AIDS Education and Prevention*, 16, 448–458.
- Holmes, W. C. & Pace, J. L. (2002). HIV-seropositive individuals' optimistic beliefs about prognosis and relation to medication and safe sex adherence. *Journal of General Internal Medicine*, 17, 677–683.
- Huebner, D. M. & Gerend, M. A. (2001). The relation between beliefs about drug treatments for HIV and sexual risk behavior in gay and bisexual men. *Annals of Behavioral Medicine*, 23, 304–312.
- Huebner, D. M., Rebchook, G. M., & Kegeles, S. M. (2004). A longitudinal study of the association between treatment optimism and sexual risk behavior in young adult gay and bisexual men. *Journal of the Acquired Immune Deficiency Syndrome*, 37, 1514–1519.
- International Collaboration on HIV Optimism. (2003). HIV treatments optimism among gay men: an international perspective. *Journal of the Acquired Immune Deficiency Syndrome*, 32, 545–550.
- Kalichman, S. C., Nachimson, D., Cherry, C., & Williams, E. (1998). AIDS treatment advances and behavioral prevention setbacks: preliminary assessment of reduced perceived threat of HIV-AIDS. *Health Psychology*, 17, 546–550.
- Kellerman, S. E., Lehman, J. S., Lansky, A., Stevens, M. R., Hecht, F. M., Bindman, A. B., et al. (2002). HIV testing within at-risk populations in the United States and the reasons for seeking or avoiding HIV testing. *Journal of the Acquired Immune Deficiency Syndrome*, 31, 202–210.
- Kelly, J. A., Hoffman, R. G., Rompa, D., & Gray, M. (1998). Protease inhibitor combination therapies and perceptions of gay men regarding AIDS severity and the need to maintain safer sex. *AIDS*, 12, F91–F95.

- Koblin, B. A., Perdue, T., Ren, L., Thiede, H., Guilin, V., MacKellar, D. A., et al. (2003). Attitudes about combination HIV therapies: the next generation of gay men at risk. *Journal of Urban Health, 80*, 510–519.
- Morin, S. F., Vernon, K., Harcourt, J. J., Steward, W. T., Volk, J., Riess, T. H., et al. (2003). Why HIV infections have increased among men who have sex with men and what to do about it: findings from California focus groups. *AIDS and Behavior, 7*, 353–362.
- Ostrow, D. E., Fox, K. J., Chmiel, J. S., Silvestre, A., Visscher, B. R., Vanable, P. A., et al. (2002). Attitudes towards highly active antiretroviral therapy are associated with sexual risk taking among HIV-infected and uninfected homosexual men. *AIDS, 16*, 775–780.
- Remien, R. H., Wagner, G., Carballo-Diequez, A., & Dolezal, C. (1998). Who may be engaging in high-risk sex due to medical treatment advances? *AIDS, 12*, 1560–1561.
- Resnicow, K., Baranowski, T., Ahluwalia, J. S., & Braithwaite, R. L. (1999). Cultural sensitivity in public health: defined and demystified. *Ethnicity and Disease, 9*, 10–21.
- Sackett, D. L. (1979). Bias in analytic research. *Journal of Chronic Disease, 32*, 51–63.
- Stolte, I. G., & Dukers, N. H. (2003). Response to ‘High-risk sexual behaviour increases among London gay men between 1998 and 2001: what is the role of HIV optimism?’. *AIDS, 17*, 2011–2012.
- Stolte, I. G., Dukers, N. H., Geskus, R. B., Coutinho, R. A., & de Wit, J. B. (2004). Homosexual men change to risky sex when perceiving less threat of HIV/AIDS since availability of highly active antiretroviral therapy: a longitudinal study. *AIDS, 18*, 303–309.
- Valdiserri, R. O. (2004). Mapping the roots of HIV/AIDS complacency: implications for program and policy development. *AIDS Education and Prevention, 16*, 426–439.
- Van de Ven, P. V., Prestage, G., French, J., Knox, S., & Kippax, S. (1998). Increase in unprotected anal intercourse with casual partners among Sydney gay men in 1996–98. *Australian New Zealand Journal of Public Health, 22*, 814–818.
- Van de Ven, P., Rawstorne, P., Nakamura, T., Crawford, J., & Kippax, S. (2002). HIV treatments optimism is associated with unprotected anal intercourse with regular and with casual partners among Australian gay and homosexually active men. *International Journal of STD and AIDS, 13*, 181–183.
- Vanable, P. A., Ostrow, D. G., & McKirnan, D. J. (2003). Viral load and HIV treatment attitudes as correlates of sexual risk behavior among HIV-positive gay men. *Journal of Psychosomatic Research, 54*, 263–269.
- Vanable, P. A., Ostrow, D. G., McKirnan, D. J., Taywaditep, K. J., & Hope, B. A. (2000). Impact of combination therapies on HIV risk perceptions and sexual risk among HIV-positive and HIV-negative gay and bisexual men. *Health Psychology, 19*, 134–145.
- Williams, L. A., Klausner, J. D., Whittington, W. L., Handsfield, H. H., Celum, C., & Holmes, K. K. (1999). Elimination and reintroduction of primary and secondary syphilis. *American Journal of Public Health, 89*, 1093–1097.
- Williamson, L. M., & Hart, G. J. (2004). HIV optimism does not explain increases in high-risk sexual behaviour among gay men in Scotland. *AIDS, 18*, 834–835.
- Wolitski, R. J., Valdiserri, R. O., Denning, P. H., & Levine, W. C. (2001). Are we headed for a resurgence of the HIV epidemic among men who have sex with men? *American Journal of Public Health, 91*, 883–888.