Published in final edited form as:

Stat Med. 2008 September 10; 27(20): 4132–4143. doi:10.1002/sim.3224.

Explaining racial disparities in HIV/AIDS incidence among women in the U.S.: A systematic review

Kristen Tillerson^{*,†,‡}

Department of Mathematics, Spelman College, Atlanta, GA, U.S.A.

SUMMARY

Surveillance data indicate that HIV incidence among Black women is more than 20 times that among White women and more than 4 times that among Hispanic women. Several studies have examined HIV risk factors by race/ethnicity including high-risk sex, drug use, inconsistent disclosure of same-sex behavior by male partners, and sexually transmitted diseases (STDs). We formed these risk factors into four hypotheses that attempt to explain the higher incidence of HIV infection among Black women. We further conducted a literature review by searching three online databases for studies published between 1985 and 2006 addressing the four hypotheses.

Literature suggests that Black women are no more likely to have unprotected sex, have multiple sexual partners, or use drugs than women of other racial/ethnic groups. However, some studies suggest that Black women are more likely to have risky sex partners and STDs. We also found that Black men are less likely to disclose their same-sex behavior to female partners.

These four hypotheses are insufficient in explaining the greater burden of HIV among Black women. Future investigations should continue to explore these and other social and behavioral factors such as poverty, health-care access, and receptivity to prevention messages to explain racial/ethnic disparities in HIV incidence.

Keywords

HIV/AIDS; disparities; women; incidence; transmission; risk behaviors

INTRODUCTION

In 2005, there were approximately five million new cases of HIV infection, and an estimated 40.3 million adults and children were living with HIV/AIDS worldwide [1]. Of those with HIV/AIDS, 17.5 million were women, which represented an increase of one million cases from 2003 [2]. Thus, even with the advances in antiretroviral therapy and prevention efforts, it is evident that HIV disease continues to pose a serious international threat to public health.

In 2003, approximately 1.2 million people were living with HIV in the United States [3]. There are an estimated 40 000 new HIV infections each year, and this estimate has remained relatively constant over time since the early 1990s [4]. Although rates decreased among African-Americans from 2001 to 2004, national HIV surveillance data show that there is a disproportionate burden of HIV disease among African-Americans. In 2003, African-

Americans only made up about 13 per cent of the total population within the surveillance area (33 states); yet they accounted for almost 50 per cent of all of the new HIV/AIDS diagnoses in 2003 [2]. African-Americans also accounted for the greatest percentage of cases diagnosed among males (44 per cent) and females (68 per cent) [2]. In fact, from 2001 to 2004 the HIV/AIDS diagnosis rate of African-American women was 20.9 times that of White women and 4.1 times higher than the rate for Hispanic women [2].

The primary modes of HIV transmission among women are injection drug use (IDU) and high-risk heterosexual contact (which includes having sex with a person known to have HIV, an intravenous drug user, a man who has sex with men (MSM), and/or a person with hemophilia) [5]. Of the 45 146 cases of HIV infection diagnosed in women from 2001 to 2004, 21 per cent of cases with a reported risk were exposed through IDU and the overwhelming majority (76 per cent) was exposed through high-risk heterosexual contact [3]. These risk factors provide a framework for developing hypotheses, explaining the increased risk of HIV among African-American women.

Few published studies directly address the question of why African-American women have such high rates of HIV infection compared with women of other races and ethnicities. However, published findings from HIV surveillance data stratified by race/ethnicity provide an important insight into racial/ethnic disparities in risk. The goal of this paper is to review the literature reporting data that support or refute the following hypotheses surrounding possible risk factors of HIV infection in women:

1. Black women are more likely than other women to engage in high-risk sexual behavior.
2. Black men are less likely than other men to disclose their same-sex behavior, which may lead to increased HIV risk behavior with Black women.
3. Black women are more likely to abuse drugs (especially intravenous drugs) and/or alcohol, which increases the risk of HIV infection via contaminated needles and/or commercial sex work.
4. Black women are more likely than other women to contract sexually transmitted diseases (STDs) that facilitate the transmission of HIV.

METHODS

An online search of three databases PubMed, JSTOR, and MEDLINE was conducted for studies published in the United States between 1985 and 2006. The following search terms were used: high-risk sexual behavior, condom use, multiple sex partners, illicit drug use, alcohol consumption, and STDs. The search was then limited to articles that reported findings stratified by race/ethnicity and then to women (with the exception of hypothesis #2). Articles on hypothesis #2, regarding the inconsistent disclosure of same-sex behavior by male partners, were searched using terms such as non-disclosure, bisexual behavior, MSM, MSM/W, etc., and were only chosen if the results were stratified by race/ethnicity. A total of 16 articles were chosen for review.

RESULTS

Hypothesis 1: Black women are more likely than other women to engage in high-risk sexual behavior

High-risk sexual behavior includes unprotected vaginal or anal intercourse, multiple sexual partners, and high-risk sexual partners. Data have shown that these behaviors are sexual risk factors associated with HIV infection. Therefore, we explored the available literature to find

articles that examined rates of these behaviors in Black women compared with women of other racial/ethnic groups (Table I).

Unprotected vaginal or anal intercourse (condom use)—In a study conducted by Soler *et al.*, 393 low-income women (172 Hispanic, 89 Black, and 132 White) aged 18–45 were recruited from various clinics in Miami, Florida, in 1994 and 1995 and asked about the frequency of their condom use during vaginal sex with a main partner in the month prior to the interview. In this study, Black and Hispanic women reported higher levels of consistent condom use (15 and 17 per cent, respectively) than White women (4 per cent) [6].

Warren *et al.* used data from the national, school-based Youth Risk Behavior Survey (YRBS) for the years 1990, 1991, 1993, and 1995 to examine trends in HIV-related risk behaviors among the U.S. students in grades 9–12. The sample sizes were 11 631 in 1990, 12 272 in 1991, 16 296 in 1993, and 10 904 in 1995. The questions they focused on were sexual experience, median age at initiation of sexual intercourse, lifetime number of sexual partners, and the use of condoms at last sexual intercourse. They found that, among females, Blacks and Whites reported significantly higher levels of condom use than did Hispanic students in 1993. In 1995, however, Blacks were significantly more likely than either Whites or Hispanics to report condom use [7]. Sly *et al.* conducted a study with 668 women (182 Black women, 287 Hispanic women, and 199 White women) aged 18–45, who were HIV negative or of unknown HIV serostatus. Data were collected from September 1994 through February 1995 at 21 STD, public health, and family planning clinics or state economic service centers in Miami, Florida. The results suggested that Black women were more likely to report condom use than Hispanic women, but there was no difference in the prevalence of condom use between Blacks and Whites and Hispanics and Whites [8].

Although these studies had very disparate samples and sample sizes (one used national data on adolescents while the other two were small clinic-based studies on adult women), they refute the hypothesis that the high rate of HIV infection among African-Americans could be due to lower levels of condom use.

Number of male sex partners—Gottlieb *et al.* [9] collected data from five STD inner-city clinics (Baltimore, Newark, Denver, San Francisco, and Long Beach) and performed a cross-sectional seroprevalence analysis using questionnaire data and serum samples from 1993 through 1996. All English-speaking patients 14 years of age or older who came for STD examinations during the study period and had vaginal intercourse in the preceding 3 months were asked to participate in the study. The study had a total of 4128 participants, 2348 (56.9 per cent) were male and 1780 (43.1 per cent) were female. The study sample was 60.7 per cent Black, 20.6 per cent White, 11.3 per cent Hispanic, and 7.4 per cent of other racial or ethnic groups. The participants were between the ages 14 and 76 (median age=25 years). The results suggested that Black females had the lowest median number of lifetime sex partners among both men and women [9].

In another multi-site clinic-based study performed by Kenney, 302 volunteer multi-ethnic women residing in the southwestern part of the United States were recruited from 10 sites, including family planning clinics, a hospital-based gynecology clinic, a women's clinic, a county jail clinic, and a physician's office. Thirty-two per cent ($n=96$) were White, 12 per cent ($n=36$) were African-American, 27 per cent ($n=83$) were Hispanic, and 29 per cent ($n=87$) were Native American women. The women ranged in age from 15 to 38 years. The results showed that White women had the highest mean number of lifetime sex partners (13.9) followed by Black women (7.5) and Native American women (5.8). Hispanic women reported the fewest partners (3.9) [10].

Santelli *et al.* analyzed the 1992 National Household Interview Survey and Youth Risk Behavior Survey on youth ($n=8450$) aged 14–22. The researchers found that among respondents who had ever had sexual intercourse ($n=5223$), Black females were significantly more likely than their White or Hispanic counterparts to report six or more lifetime sexual partners [11].

The results of the studies by Gottlieb *et al.* and Kenney refute the hypothesis that Black women have more sexual partners than women of other racial/ethnic groups. The Santelli *et al.* study, however, suggests that among sexually active teens and young adult women, Black women are more likely to report a greater number of lifetime partners. These findings suggest that the impact of this risk factor on HIV transmission among Black women may vary with age.

Risky sexual partner—A risky sexual partner is defined as someone who is HIV-positive, an injection drug user, non-monogamous, a transfusion recipient, a hemophiliac, or recently incarcerated [12]. Kenney [10] found that White women and African-American women reported that their partners had an average of more than 55 previous sex partners, whereas Hispanic and Native American women reported that their partners had less than 31 previous sex partners. Thus, these results show that African-American women and White women have similar levels of perceived exposure via non-monogamous male partners.

Grinstead *et al.* [12] analyzed sex behavior data from 3482 women aged 18–49 living in 23 urban areas in the United States, who participated in the 1990–1991 National AIDS Behavioral Surveys. The authors looked at risk behaviors associated with exposure to HIV including multiple sexual partners, having a risky sexual partner, or having both multiple sexual partners and a risky main partner. A limitation of the study is that they did not stratify the results by race; however, they did report percentages of having risky main sex partners. They found that 6.3 per cent of Black women, 5.1 per cent of Hispanic women, and 4.3 per cent of White women had a risky main sexual partner (defined as the person they had sex with most frequently in the previous year) [12].

The results of the study conducted by Kenney both supported and refuted the hypothesis that African-American women are more likely to engage in sexual behavior with a risky partner. African-American women had higher risk partners than Hispanic women but not substantially higher than White women; hence, the results were inconclusive.

Hypothesis 2: Black men are less likely than other men to disclose their same-sex behavior, which may lead to increased HIV risk behavior with black women

In the past few years, the ‘down low’ phenomenon, which refers to a bisexual man’s failure to inform his female sex partner(s) of his same-sex behavior, has received a great amount of attention in the scientific literature and the media. This phenomenon has been suspected of being a major cause of the high incidence rates of HIV in African-American women [13]. The term ‘down low’ became main stream after the high incidence rates of HIV among Black MSM came to light along with the fact that a large proportion of Black MSM identify as heterosexual [13]. Therefore, we wanted to explore whether Black men are less likely than men of other races and ethnicities to disclose their sexual behavior with other men to their female partners, which could lead to high incidence rates of HIV in African-American women (Table II).

The CDC-sponsored Young Men’s Survey asked about disclosure of same-sex behavior. The survey was administered in six cities and had 5589 MSM participants from 1994 through 2000 [14]. A total of 637 (11 per cent) MSM were defined as non-disclosers; of these, Black (18 per cent) MSM were more likely to be non-disclosers than were White MSM (8 per cent) and all other races and ethnic groups. Furthermore, among Black MSM, non-disclosers were more likely than disclosers to have female partners (lifetime partners, main partners, and casual

partners) and were more likely to have unprotected vaginal or anal sex with female partners than Black disclosers [14].

Montgomery *et al.* [15] examined data from the Supplement to HIV/AIDS Surveillance (SHAS) project, which is an ongoing CDC-sponsored multi-site (12 state or local health departments) cross-sectional interview project of persons 18 or older diagnosed with HIV/AIDS. They used the data between 1 January 1995 and 1 July 2000 to describe sexual behavior and self-perceived sexual identity among men who have sex only with men (MSM) and men who have sex with men and women (MSM/MSW). Of the 5156 MSM interviewed for SHAS, 48 per cent were White, 31 per cent were Black, and 19 per cent were Hispanic. Thirteen per cent of White MSM and 26 per cent of Hispanic MSM reported bisexual behavior compared with 34 per cent of Black MSM. Also, gay identity was significantly higher among White MSM than among Black MSM [15].

This study also explored self-reported sexual behavior among women who reported that they had sex with men in the last five years. Specifically, the authors looked at responses to the question, 'Have you had sex with a bisexual man in the last five years?' stratified by race/ethnicity to evaluate the degree to which women are knowledgeable about bisexual identity or behavior of their male partners. Among the 3139 women interviewed, 14 per cent of White women reported having sex with a bisexual man compared with 6 per cent of Black and 6 per cent of Hispanic women.

In a larger study, Chu *et al.* [16] used national surveillance data for AIDS cases from June 1981 through June 1990 to evaluate the importance of bisexual men in the heterosexual transmission of HIV to women by examining the prior sexual behavior of men with AIDS. Men were categorized as homosexual if they reported having sex only with men and bisexual if they reported having sex with both women and men. The data showed that 65 389 men reported having sex with men since 1977 and 16 793 (26 per cent) also reported having sex with women. Among these men, bisexuality was reported by Black men (41 per cent) at a higher rate than Hispanic (31 per cent) or White men (21 per cent).

Also, in this study, women were categorized as having AIDS due to heterosexual transmission if they had no history of blood transfusion or IV drug use and reported having had sex with someone who had HIV or AIDS, engaged in IV drug use, male-to-male sexual contact, or had a blood transfusion. Among 3555 women who acquired AIDS through heterosexual contact, 11 per cent reported sexual contact with a bisexual man and no other risk factor. Furthermore, in 1989, Black women were 5 times more likely to contract AIDS due to sex with a bisexual man than White women [16].

The results of these studies do not directly support the hypothesis because the race of the female partners was not reported; hence, we cannot make a direct link between bisexual activity in Black men and its impact on Black women. However, O'Connor showed that Black men and women are least likely to have sexual partners outside of their racial group; hence, Black individuals infected with an STD are likely to spread the disease to people within their own racial/ethnic group [17].

These results support the hypothesis that Black men are less likely to disclose their sexual identity, which could lead to increased risk of infecting Black women with HIV. The study by Montgomery *et al.* showed that although more Black men reported bisexual behavior, fewer Black women reported having bisexual partners. These results lend support to the assertion that Black bisexual men are less likely than White bisexual men to tell their female partners about their same-sex behaviors. However, only data obtained from couples can confirm this.

Hypothesis 3: Black women are more likely than other women to abuse substances, especially injection drugs, which increases their risk of HIV infection

IDU is one of the primary modes of HIV infection. Furthermore, it has been shown that the use of drugs and alcohol can lead to high-risk sexual behavior (i.e. unprotected sex and/or commercial sex work), which puts one at increased risk of HIV infection. Therefore, in order to evaluate the impact of drug use on racial disparity in HIV incidence, we examined whether Black women are more likely to abuse drugs and alcohol than women of other racial/ethnic groups (Table III).

Sly *et al.* found that White women were more likely than Black or Hispanic women to report substance use. Substance use was defined as the use of marijuana, cocaine, or other drugs such as pills or inhalants in the 6 months prior to the study [8]. Therefore, these data do not support the hypothesis that Black women are more likely to abuse certain substances than women of other races and ethnicities [8].

Further, an analysis of the National Household Survey on Drug Abuse in 1998 [18] reported estimates of lifetime history of illicit drug use among women aged 15–44 from a sample of 25 500 U.S. residents aged 12 and older. Illicit drug use was defined as the use of any of 17 different drugs including marijuana, cocaine, crack, heroin, hallucinogens, PCP, etc. The data indicate that drug use is highest among White women (51.2 per cent), followed by African-American women (36.0 per cent), Hispanic women (26.2 per cent), and women of other racial/ethnic groups (20.2 per cent) [18].

Perreira and Cortes [19] used data from the Fragile Families and Child Well-being Study, a stratified random sample of hospital births in 20 large U.S. cities, to identify the prevalence of maternal alcohol, tobacco, and illicit drug use during pregnancy within each racial/ethnic group in 1999. The data used were from interviews with 4898 mothers and 3830 fathers. This study found that White mothers were more likely to have used alcohol and tobacco during pregnancy. Black mothers were 71 per cent less likely than White women to smoke during pregnancy and 41 per cent less likely to drink. Black mothers, however, were more likely to have used illicit drugs. However, this sample is not representative of the entire population as it only takes into consideration prenatal alcohol, tobacco, and drug use [19].

These studies convey inconsistent results with regard to drug use among African-American women compared with White women. Two of the studies [9,18] revealed that White women were more likely to report substance use. Furthermore, one of the investigations [19] supported the hypothesis that African-American women are more likely to use illicit drugs but reported that White women were more likely to use alcohol and tobacco during pregnancy [19].

Hypothesis 4: Black women are more likely than other women to contract STDs that facilitate the transmission of HIV

Biological evidence has shown that acquiring STDs (other than HIV) puts one at higher risk of HIV infection. In fact, individuals who are infected with STDs are at least 2–5 times more likely than uninfected individuals to acquire HIV if they are exposed to the virus through sexual contact [20]. Therefore, we examined whether Black women were more likely than other racial ethnic groups to have an STD, which could put them at higher risk of HIV infection (Table IV).

Herpes Simplex Virus-2 (HSV-2) has been found to be a risk factor for HIV infection [21]. Gottlieb *et al.* found that HSV-2 seroprevalence was higher among women (52.0 per cent) [than] among men (32.4). HSV-2 seroprevalence among Blacks was 48.1%, significantly higher than among Whites (30.1 per cent; $P<0.0001$). Even among women who report only 1–5 lifetime sex partners, HSV-2 seroprevalence among Black women was 45.7 per cent (95 per

cent CI, 40.1–51.1); among non-Black women with only 1–5 lifetime sex partners, HSV-2 seroprevalence was only 24.7 per cent (95 per cent CI, 18.8–30.5). However, these results may not generalize to the entire population because the sample was recruited from STD clinics [9].

Steele *et al.* [22] conducted a review and found that in 2003 the rate of chlamydial infection among African-American women was more than 7 times higher than the rate among White women; African-American women had the highest rate in 2003 (616.1/100 000 females) and Asian/Pacific Islander women had the lowest (25.8/100 000 females.) Although primary and secondary syphilis rates decreased by 31.8 per cent from 2002 to 2003, among African-American females, the rate in 2003 (4.2/100 000 females) was approximately 20 times the rate among White females (0.2/100 000 females). These results strongly support the hypothesis that Black women are more likely to contract STDs, which could put them at higher risk of HIV infection.

Conversely, using data from the National Survey of Women, an investigation by Tanfer *et al.* revealed that among 1669 women aged 20–37, Black women had lower percentages of Chlamydia (5.5 per cent compared with 7.3 per cent), Herpes (5.5 per cent compared with 7.3 per cent) and Genital Warts (5.5 per cent compared with 7.3 per cent) when compared with Whites. On the contrary, Black women had higher percentages of Gonorrhea (12.6 per cent compared with 2.8 per cent) and Syphilis (2.1 per cent compared with 0.2 per cent). In this analysis it is important to note that ‘White’ included all racial groups other than Black; thus, the rate of STDs among Hispanic women could have skewed the data [23].

DISCUSSION

This study had two major limitations. First, there were relatively few studies that reported racial disparities in high-risk behavior among women. Second, the studies that did report racial disparities in behavior varied considerably in terms of study design, sample size, and population demographics (age, geographic region, etc.). This makes it very difficult to compare the results of these studies with one another and draw definitive global conclusions.

Nevertheless, the literature reviewed in this article did provide some noteworthy findings regarding the four hypotheses that attempt to explain the higher incidence of HIV infection among African-American women. Literature suggests that African-American women are no more likely to have unprotected sex, multiple partners, or abuse substances than women of other racial/ethnic groups. There is, therefore, insufficient evidence that the lack of condom use, multiple sexual partners, and substance abuse are major causes of the disproportionate rates of HIV incidence among African-American women. Based on these findings, population-level interventions geared towards curbing these behaviors in African-American women may not be effective in eliminating the racial disparity in HIV disease among women.

Some studies suggest that African-American women are more likely to have risky sex partners and STDs. Literature also showed that African-American men who have sex with men are more likely to engage in bisexual behavior and less likely to disclose their same-sex behavior to female partners. Also, according to national HIV/AIDS surveillance data, African-American women were more likely to report becoming infected with HIV as a result of sex with a bisexual partner. Therefore, these behaviors could be contributing risk factors to the higher rates of HIV infection among African-American women. It is important to note, however, a serious limitation in the HIV surveillance data. Almost 80 per cent of reported HIV cases among women between 1999 and 2002 were reported without a risk factor [13]. Studies based on these data, therefore, are subject to considerable bias due to missing data.

Future investigations should continue to explore these risk factors on a larger scale. This will allow us to determine whether African-American women are engaging in certain behaviors that put them at higher risk for HIV infection and thereby develop effective behavioral intervention strategies. Furthermore, studies should focus on other social, behavioral, and economic factors that could lead to HIV infection such as poverty, low education, and low socioeconomic status as well as childhood sexual abuse to explain racial/ethnic disparities in HIV incidence. For example, poverty can lead to decreased health-care access, which can lead to longer periods of STD infection, which in turn can facilitate HIV infection. Also, childhood sexual abuse can affect sexual decision-making and result in high-risk sexual behavior and drug use to mask the pain of past experiences.

Literature reveals that focusing interventions on individual risk behaviors such as condom use is not appropriate for the African-American population. African-Americans are at high risk even when their behavior is considered low risk, whereas the White population's risk increases when their behavior is defined as high risk [24]. Thus, future HIV prevention interventions should focus on the infection status of the sexual partner by increasing awareness of and access to testing for those unknown of their serostatus and reducing risky sexual behavior among HIV positive persons. Future efforts should also inform women about risky sexual partners and address the stigma of homosexuality within the African-American community. Addressing this stigma may encourage Black MSM to disclose same-sex behavior to female partners.

In addition, future analyses should focus on quantifying the contribution of each factor to the overall epidemic in Black women. This will provide a measure of the potential effectiveness of interventions targeting these specific sources and provide scientifically rigorous information on which to inform decisions of prevention resource allocation.

ACKNOWLEDGEMENTS

I would like to thank Felicia Hardnett and Sherri Pals for providing me with guidance on this project as well as my NIMH-COR and PHSI advisors. Lastly, I would like to thank Desmond Moore for his continued support.

Contract/grant sponsor: Public Health Sciences Institute; contract/grant number: U50/CCU425070

Contract/grant sponsor: National Institute of Mental Health; contract/grant number: T34 MH-16573

REFERENCES

1. *Joint United Nations Program on HIV/AIDS*, UNAIDS and World Health Organization. 2005. <http://www.unaids.org/epi/2005/doc/report pdf.asp>
2. Centers for Disease Control and Prevention. Racial/ethnic disparities in diagnoses of HIV/AIDS—33 States, 2001–2004. *MMWR Weekly Report* 2006;55(5):121–125.
3. Centers for Disease Control and Prevention. Trends in HIV/AIDS diagnoses—33 States, 2001–2004. *MMWR Weekly Report* 2005;54(45):1149–1153.
4. Centers for Disease Control and Prevention. Advancing HIV prevention: new strategies for a changing epidemic United States. *MMWR Weekly Report* 2003;52(15):329–332.
5. Department of Health and Human Services. HIV/AIDS Surveillance Report. Vol. vol. 16. Department of Health and Human Services; 2004.
6. Soler H, Quadagno D, Sly DF, Riehman KS, Eberstein IW, Harrison DF. Relationship dynamics, ethnicity and condom use among low-income women. *Family Planning Perspectives* 2000;32(2):82–101. [PubMed: 10779239]
7. Warren CW, Santelli JS, Everett SA, Kann L, Collins JL, Cassell C, Morris L, Kolbe LJ. Sexual behavior among U.S. high school students, 1990–1995. *Family Planning Perspectives* 1998;30(4):170. [PubMed: 9711454]

8. Sly DF, Quadagno D, Harrison DF, Eberstein I, Riehman K. The association between substance use, condom use and sexual risk among low-income women. *Family Planning Perspectives* 1997;29(3): 132–136. [PubMed: 9179583]
9. Gottlieb SL, Douglas JM Jr, Schmid DS, Bolan G, Iatesta M, Malotte CK, Zenilman J, Foster M, Barón AE, Steiner JF, Peterman TA, Kamb ML. Seroprevalence and correlates of herpes simplex virus type 2 infection in five sexually transmitted-disease clinics. *Journal of Infectious Diseases* 2002;186:1381–1389. [PubMed: 12404152]
10. Kenney JW. Ethnic differences in risk factors associated with genital human papillomavirus infections. *Journal of Advanced Nursing* 1996;23:1221–1227. [PubMed: 8796472]
11. Santelli JS, Brener ND, Lowry R, Bhatt A, Zabin LS. Multiple sexual partners among U.S. adolescents and young adults. *Family Planning Perspectives* 1998;30(6):271–275. [PubMed: 9859017]
12. Grinstead OA, Faigles B, Binson D, Eversley R. Sexual risk for human immunodeficiency virus infection among women in high-risk cities. *Family Planning Perspectives* 1993;25(6):252–256+277. [PubMed: 8313949]
13. Millett G, Malebranche D, Mason B, Spikes P. Focusing ‘down low’: bisexual black men, HIV Risk and heterosexual transmission. *Journal of the National Medical Association* 2004;97(7):52S–57S. [PubMed: 16080458]
14. Centers for Disease Control and Prevention. HIV/STD risks in young men who have sex with men who do not disclose their sexual orientation, six U.S. cities, 1994–2000. *MMWR Weekly Report* 2003;52(5):81–85.
15. Montgomery JP, Mokotoff ED, Gentry AC, Blair JM. The extent of bisexual behaviour in HIV-infected men and implications for transmission to their female sex partners. *AIDS CARE* 2003;15(6):829–837. [PubMed: 14617504]
16. Chu SY, Peterman T, Doll LS, Buehler JW, Curran J. AIDS in bisexual men in the United States: epidemiology and transmission to women. *American Journal of Public Health* 1992;82(2):220–224. [PubMed: 1739151]
17. O’Connor ML. Sexual network patterns contribute to racial disparities in disease risk. *Family Planning Perspectives* 1999;31(6):309–310.
18. National Institute on Drug Abuse. Drug Use among Racial/Ethnic Minorities: Revised. Division of Epidemiology Services and Prevention Research, National Institutes of Health; 2003. Available from: <http://www.nida.nih.gov/pubs/minorities/>
19. Perreira KM, Cortes KE. Race/ethnicity and nativity differences in alcohol and tobacco use during pregnancy. *American Journal of Public Health* 2006;96(9):1629–1636. [PubMed: 16873756]
20. Fleming D, Wasserheit J. From epidemiological synergy to public health policy and practice: the contribution of other sexually transmitted diseases to sexual transmission of HIV infection. *Sexually Transmitted Infections* 1999;75:3–17. [PubMed: 10448335]
21. Hook EW 3rd, Cannon RO, Nahmias AJ, Lee FF, Campbell CH Jr, Glasser D, Quinn TC. Herpes simplex virus infection as a risk factor for human immunodeficiency virus infection in heterosexuals. *Journal of Infectious Diseases* 1992;165:251–255. [PubMed: 1309846]
22. Steele BC, Richmond-Reese V, Lomax S. Racial and ethnic disparities in HIV/AIDS, sexually transmitted diseases, and tuberculosis among women. *Journal of Women’s Health* 2006;15(2):116–122.
23. Tanfer K, Cubbins LA, Billy JOG. Gender, race, class and self-reported sexually transmitted disease incidence. *Family Planning Perspectives* 1995;27(5):196–202. [PubMed: 9104606]
24. Hallfors DD, Iritani BJ, Miller WC, Bauer DJ. Sexual and drug behavior patterns and HIV and STD racial disparities: the need for new directions. *American Journal of Public Health* 2007;97(1):125–132. [PubMed: 17138921]

Table 1

Hypothesis 1

Source	Data collection method	Sample description	Location	Data collection year (S)	Key findings
[6]	Clinic interviews	393 women aged 18–45	Miami, FL	1994–1995	Refuted: Blacks and Hispanics had higher levels of consistent condom use than Whites
[7]	YRBS*	10 904–16 296 (varied by year)	United States	1990, 1991, 1993, 1995	Refuted: Blacks and Whites had higher levels of condom use (1993) and Blacks had higher levels than Whites and Hispanics (1995)
[8]	Multiple Site Questionnaire	Male/female aged 14–22 668 women aged 18–45	Miami, FL	1994–1995	Refuted: Blacks reported higher levels of condom use than Hispanics
[9]	STD Clinic Questionnaire/serum samples	4128:2348 male/1780 female aged 14–76	5 urban areas	1993–1996	Refuted: Blacks had lowest median number lifetime sex partners
[10]	Multiple Site Questionnaire	302 women aged 15–38	Southwest US	Not available	Refuted: Whites had highest mean number of lifetime sex partners Refuted: Blacks and Whites had partners with an average of 55 past partners
[11]	NHIS [†] , YRBS	8450 male/female youth aged 14–22	United States	1992	Supported: Blacks were more likely than Whites or Hispanics to report six or more lifetime sexual partners
[12]	NABS [‡]	3482 women aged 18–49	23 urban areas	1990–1991	Supported: Blacks had higher percentage of risky partners

- * Youth Risk Behavior Survey: three-stage cluster sample design.
- † National Health Interview Survey: multistage area probability design.
- ‡ National AIDS Behavior Survey: telephone, using random-digit dialing.

Table II

Hypothesis 2

Source	Data collection method	Sample description	Location	Data collection years	Key findings
[14]	Clinic interviews	5589 MSM [*]	6 U.S. cities	1994–2000	Supported: Black MSM were more likely to be non-disclosers than MSM of all other racial/ethnic groups
[15]	SHAS [†]	5156 MSM 18+ with HIV/AIDS 3139 women	12 sites United States	1995–2000	Supported: Black MSM more likely to report bisexual behavior and Black women less likely to report sex w/ bisexual men
[16]	National surveillance data	65 389 MSM, 3555 women, 13+	United States	1981–1990	Inconclusive: Black MSM more likely to report bisexuality

^{*} MSM: Men who have sex with men.

[†] Supplement to HIV/AIDS Surveillance Project: population and facility-based sampling.

Table III

Hypothesis 3

Source	Data collection method	Sample description	Location	Data collection year (S)	Key findings
[8]	Multiple Site Questionnaire	668 women aged 18–45	Miami, FL	1994–1995	Refuted: Whites were more likely than Blacks or Hispanics to report substance use
[18] [*]	NHSDA [†]	25 000 women aged 15–44	United States	1998	Refuted: Lifetime drug use was highest among Whites compared with all races/ethnicities
[19]	SRS [‡] of hospital births	4898 mothers and 3830 fathers	20 U.S. cities	1999	Inconclusive: Whites were more likely to have used alcohol and tobacco during pregnancy; Blacks were more likely to have used illicit drugs

^{*} National Institute on Drug Abuse.
[†] National Household Survey on Drug Abuse: multistage probability sample design.
[‡] SRS: stratified random sample.

Table IV

Hypothesis 4

Source	Data collection method	Sample description	Location	Data collection year (S)	Key findings
[9]	STD Clinic Questionnaire/serum samples	4128:2348 male/1780 female aged 14–76	5 U.S. cities	1993–1996	Supported: Herpes simplex 2 was highest among Blacks
[22]	Review	N/A	United States	2003	Supported: Chlamydia and syphilis rates highest among Blacks
[23]	NSW*	1669 women aged 20–37	United States	1991	Inconclusive: Blacks had lower percentages of Chlamydia, Herpes and Genital Warts when compared with Whites; Black women had higher percentages of Gonorrhea and Syphilis

* National Survey of Women: multistage, stratified, clustered area probability design.