THE RELATIONSHIP OF RELIGIOSITY, SPIRITUALITY AND HIGH-RISK
SEXUAL AND RELATED BEHAVIORS AMONG BLACK MEN WHO HAVE SEX
WITH MEN (BLACK MSM)

by

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ABSTRACT

Religion and spirituality are important concepts for many Black MSM. While many social factors may be associated with the increasing disparity of HIV infection among Black MSM, high levels of religiosity and spirituality prevalent in Black culture may be correlated with high risk behavior among Black MSM and may help explain this population’s increasing incidence of HIV infection. Research supports a relationship between religiosity, spirituality, and high risk behavior among populations. Some research has suggested that religiosity and spirituality among Black MSM may be correlated but are multifaceted constructs. Conclusions suggest that among Black MSM these constructs account for certain levels of cognitive dissonance among Black MSM addressing their sexual and religious identity and can lead to negative coping behaviors and negative health outcomes (e.g., higher sexual risk, higher substance abuse, and higher levels of depression) among Black MSM. Findings also suggest positive spiritual and religious experiences may reduce the level of dissonance experienced by some Black MSM and may lead to positive health outcomes. Despite the unique role of religiosity and spirituality among Black MSM, research has not examined the relationships of these constructs and high sexual risk behavior among Black MSM. Future effective HIV prevention interventions intended for Black MSM may well include dissonance reduction, as well as, spirituality and religiosity components to achieve risk reduction interventions that may well decrease the continued HIV incidence among Black MSM.
DEDICATION

This work is dedicated to the memory of the following persons:

Gwen “Mama” Watkins

Kirk Anthony Lewis

Billy R. Cox

Rev. Dr. Martin Luther King, Jr.

“Our lives begin to end the day we become silent about the things that matter.”
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To my Parents, Tommie, Sr. and Gwen “Mama” Watkins (who is gone to be with the Lord) for raising and supporting me in a positive and loving environment while teaching me the values which define my life today and without whom I would be successful in achieving this education level.

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THE RELATIONSHIP OF RELIGIOSITY, SPIRITUALITY AND HIGH-RISK SEXUAL AND RELATED BEHAVIORS AMONG MEN WHO HAVE SEX WITH MEN (BLACK MSM)

TOMMIE LEE WATKINS, JR.

HEALTH EDUCATION AND HEALTH PROMOTION

INTRODUCTION

Background

HIV and AIDS rates among Black MSM

HIV/ AIDS incidence rates for Blacks are rapidly increasing. Although Blacks account for only 13% of the total United States population, they make up approximately half of the 1 million Americans living with HIV infection (CDC, 2009). An estimated 1 in 16 Black males in the United States is living with HIV infection (CDC, 2009). In 2009, the CDC estimated that 73% of the 56,500 new cases of HIV were among males, and Black men who have sex with men (MSM) were at increased risk (CDC, 2009). Black men whose sex partners include other men may identify as gay, bisexual, heterosexual or “other than heterosexual”; men in these categories account for 53% of the total cases of HIV/AIDS among US males. Incidence of HIV/AIDS among young persons under age 25 is increasing among all populations and disproportionately among Black MSM, who account for 63% of young adult cases in the U.S. It is estimated that nearly 40% of Black MSM are HIV-infected and 25.7 % do not know their HIV status (CDC, 2009; MMWR, 2012; Prejean, et. al., 2011).
Religiosity and Spirituality among Black MSM

Blacks typically have a strong association with religion and religious institutions. A recent national survey of religious behaviors and beliefs found that, relative to other racial and ethnic groups, Blacks are more likely to report a formal religious affiliation (Glick & Golden, 2010, Pew, 2008; Pitt, 2010). A high majority (85%) of Blacks reported that religion is very important to them, and 60% of Black individuals surveyed reported weekly or “regular” church attendance (Pew, 2008). Among the Black individuals surveyed who reported no formal religious affiliation, 60% showed that religion was somewhat or very important in their lives (Pew, 2008). Comparatively, 56% of the general population reported that religion was very important to them, and 39% reported weekly or regular church attendance (Pew, 2008).

In addition to religious differences among racial populations persistent differences concerning the acceptance of homosexuality appear to exist among different racial communities. Blacks tend to report more negative attitudes regarding homosexuality than Whites and other racial/ethnic groups (Glick & Golden, 2010; Pitt, 2010). In a recent survey, 85% of Blacks endorsed that homosexuality is sinful and tended to report generally unfavorable views regarding homosexual males (Pew 2008). Another national study examining differences in racial attitudes towards homosexuality found that 72.3% of Blacks surveyed indicated that homosexuality is “always wrong,” while 51.8% of Whites surveyed reported the same response (Glick and Golden, 2010). The study also found that this attitude toward homosexuality among Blacks was largely unchanged since the 1970’s, but among White respondents negative perceptions of homosexuality declined from 70.8% to 51.8% over the same time period (Glick & Golden, 2010). Of those MSM surveyed, twice as many Black MSM compared to White MSM reported that “homosexuality is always wrong,” (Glick & Golden, 2010). Research suggests that Blacks
also tend to experience homophobia, or a negative view of homosexual behavior, in their communities more often than other racial groups (Jeffries et al., 2008; Miller, 2007). These different attitudes concerning homosexuality observed among Black MSM versus White MSM and higher levels of homophobia experienced by Black MSM versus other MSM may, among other factors, contribute to increased incidence of HIV/AIDS among Black MSM (Glick & Golden, 2010; Jeffries, et. al, 2012; Pitt, 2010).

Despite these negative cultural norms, many Black MSM report being very active in Black churches, often holding church offices that require congregational consent (Pew, 2008; Pitt, 2010). Black MSM who participate heavily in their religious communities often do not see a contradiction between their sexual orientation and their high visibility and activity in the church (Pitt, 2010). Black MSM describe that remaining active in their churches fulfills social, emotional, and spiritual needs similar to that described by heterosexual-identified persons (Wilson & Miller, 2002; Woodyard, Peterson, and Stokes, 2000).

Many Black MSM report that being active in their religious communities is part of their spiritual identity versus their religious identity; and so they consider themselves spiritual or in a relationship with God or a higher power (Pew, 2008; Pitt, 2010; Yip, 2002). Many Black MSM considered church attendance and participating in a religious community to be indicative of their religiosity, while their spirituality was their set of intrinsic beliefs (Pew, 2008; Pitt, 2010). Black MSM described that they could be spiritual and not religious; that is, one does not need to be involved in a religious community to be spiritual (Miller, 2007; Pitt, 2010; Yip, 2002). For a large segment of the Black MSM population, being active in the church is important socially and spiritually, but many distinguish between this social and spiritual identity and a religious identity which is incongruent with other parts of their lives.
Cognitive Dissonance and Sexual Risk Among Black MSM

Because of the strong association of many Blacks with predominately Black religious institutions, their attitudes regarding sexual norms are likely influenced by those promulgated and supported by those religious communities (Pew, 2008; Pitt, 2010; Stokes & Peterson, 1998; Yip, 2002). Due to the negative attitudes of Black churches regarding sex, and homosexuality in particular (Miller, 2007; Wilson and Miller, 2002), many Black MSM report that they find themselves in conflict with and rejected by organized religious communities (Fullilove, 2006; Jeffries et al., 2008; Miller, 2007; Wilson and Miller, 2002; Woodyard, Peterson, & Stokes, 2000). Such conflicts and incongruities between key life areas can lead to life role disconnects.

The stigma associated with homosexuality may inhibit some men from identifying themselves as gay or bisexual, even though they have sex with other men (Stokes & Peterson, 1998). Some men who have sex with men and also with women don't identify themselves as gay or bisexual (Jeffries, et. al., 2010; Stokes & Peterson, 1998; Woodyard, Peterson, & Stokes, 2000). Black MSM in this category may be less likely to be long-term monogamously partnered, less likely to arrive at high-risk locations with prevention supplies, and/or less likely to engage in safer sexual practices, such as condom use (Millet, et. al., 2006; Murray, et. al., 2007). All of these risk behaviors are associated with increased risk of HIV disease.

Homonegative religious norms also may lead to decreased knowledge of HIV status, increased exposure to other STDs, and higher rates of HIV risk behavior (Ross, et. al., 2008). Research and surveillance among Black men has shown elevated rates of STDs and undetected or late diagnosis of HIV infection, compared to other populations (Jeffries, et. al., 2011; Millet, et. al., 2006; Murray, et. al., 2007); both of these health disparities may contribute to higher rates
of HIV infection among Black MSM. Higher rates of STDs are proxy measures for HIV risk behavior engagement and also independently may increase risk of HIV transmission (Beatty, et. al., 2004; CDC, 2009). Late diagnosis of HIV is important because individuals in the later stages of HIV infection tend to have higher viral loads, which are associated with increased risk of HIV transmission (Kitahata, et. al., 2009; Millet, et al, 2006). Thus, Black MSM who do not know their HIV status may engage in higher risk behavior than Black MSM who are aware of their HIV status (Marks et al., 2007).

Homonegative societal messages that appear as “norms” can influence negative attitudes, and beliefs among Black MSM that contribute to high-risk sexual behaviors. For example, studies by Miller (2005, 2007), Davis (2003), and Fullilove (2006) found that many of the attitudes, beliefs, and sexual behaviors of Black MSM are related to negative religious norms promulgated by largely Black religious congregations to which many Black MSM belong. As a result of these messages, many Black MSM may perceive their religious beliefs as at odds with their sexual orientation thus causing inner conflict or dissonance (Miller, 2007). Results of multiple surveys indicate that these negative attitudes are perceived by Black MSM and that they are widely held by many Blacks in the United States (e.g., Glick & Golden, 2010; Pew, 2008, Pitt, 2010). These community norms, such as negative messages from largely Black religious institutions, have caused some Black MSM to terminate their religious affiliation and withdraw from that social support community to high risk social settings (e.g., bars, clubs, etc.) (Miller, 2007; Millet and Peterson, 2007; Millet, et. al., 2006). It is possible that Black MSM internalize the homonegative (judgmental) messages often present in their religious and larger community contexts, giving rise to dissonant self-perceptions (Glick & Golden, 2010). Past research suggests that such dissonance can magnify stress and diminish coping skills (Miller, 2005;
Miller, 2007; Pargament, et. al., 2004). This suggestion is consistent with findings suggesting that homonegative religious attitudes and messages may be negatively associated with positive health outcomes (Jeffries, et. al., 2008) and have been shown in some studies to be associated with high risk sexual behaviors (Marks et al., 2007).

Several studies also have found that the internalized barriers of stigma, shame, low self-esteem and homophobia create an atmosphere of silence around MSM sexual behaviors and decrease the probability of Black MSM to discuss high-risk sexual behaviors. This culture of silence can lessen the impact of HIV prevention education interventions (Jeffries, et. al., 2012; Martin & Knox, 1997; Malebranche, 2003). Some studies have suggested also that the internalization of religiously influenced homonegative messages contributes to lower self-efficacy regarding preventive sexual practices among this population (Martin & Knox, 1997; Noar et, al, 2009; Stokes & Peterson, 1999). Thus, it becomes important to examine the association between religiosity and spirituality and high risk sexual behavior among Black MSM.

Religiosity and Spirituality as constructs often have been presented in the literature as overlapping constructs. Typically religion, in the Judeo-Christian context, is measured by questionnaires that inquire about the frequency of the overt acts associated with a particular religion such as how often one attends church or how often one reads the Bible. Measures of spirituality often include questions such as whether one “believes in a higher power,” or “God operates in my life every day,” (Davis, et al, 2003; Coyle, 2001; Miller, 2007).

Although religion and spirituality as concepts often overlap and much research has found high correlations between the two (Horn, et., al., 2005; Ironson, et., al., 2002), “religion” typically refers to the formal set of beliefs and practices affiliated with an acknowledged
religious authority and includes such overt visible acts as praying before meals, attending worship services, and reading sacred texts (Davis, et al, 2003; Coyle, 2001). “Spirituality” typically denotes a personal experience or feeling of connectedness with a higher being and typifies intrinsic unseen qualities appropriated to one's relationship with an otherness, higher power, or God. Spirituality can also include the search or path for transcendent meaning (Davis, et al, 2003; Coyle, 2001; Miller, 2007).

Also important, in addition to examining the relationship between religiosity and spirituality and high risk behavior among Black MSM, is the effect the homonegative messages might have on Black MSM risk behavior. Research suggests a positive association between homophobia, cognitive dissonance, depression, and high risk behavior among this population (Jeffries, et. al., 2008; Martin & Knox, 1997; Stokes & Peterson, 1999).

Several studies found substance abuse and depression to be positively correlated with high risk sexual behavior among Black MSM (Bruce, et. al., 2012; CDC, 2009; Klobin, et. al., 2006; Reisner, et. al., 2009; Stall, et., al., 2003 ). In addition, several studies suggest that religiosity promotes cognitive dissonance, lower self-esteem, and lower self-efficacy among Black MSM and is therefore associated with higher rates of high sexual risk behavior, substance use, and depression (Colfax, et. al., 2003; Klobin, et. al., 2006; Mahaffy, 1996; Wilson & Miller, 2002; VanDevanter, et. al., 2010; Woodyard, Peterson, & Stokes, 2000).

Cognitive Dissonance Theory (Festinger, 1957) postulates that incongruence between one’s beliefs and behaviors create psychological tension or discomfort that result in emotional and mental distress, which is referred to as cognitive dissonance. This theory will be used as a conceptual framework to analyze the association between religiosity and spirituality and high sexual risk behavior. This theoretical framework will also be used to examine how substance
abuse and depression, both of which have been shown to be positively associated with high risk sexual behavior among MSM (Aronson, 2007; Hampton, et. al., 2010; Hardy & Raffaelli, 2003), are related to measures of religiosity and spirituality.

For example, Hamblin & Gross (2011) found that among homosexual participants who described their church as homophobic, more church attendance was associated with higher incidence of generalized anxiety symptoms, which can lead to depression. However, no similar effect was found among those participants who reported attending LGBT accepting religious communities. Similarly, Ross and colleagues (2008) found that internalized homonegativity was significantly correlated with Black MSM depressive attitudes but was unrelated to attitudes of other MSM participants; and among Black MSM, internalized homonegativity was associated with higher rates of unsafe sexual practices (e.g., less disclosure about HIV-positive status, higher frequency of serodiscordant unprotected anal intercourse, and lower rates of condom use). Ross and Rosser (1996) found that internalized homophobia was positively correlated with LGBT individuals reporting moral and religious unacceptability of being LGBT. Conversely, research has suggested that even though many studies have found religiosity and spirituality to be highly associated (e.g., Aronson, 2007; Hardy & Raffaelli, 2003), spirituality may serve to diminish or eliminate cognitive distress (i.e., supports cognitive consonance) among Black MSM (Ross, et. al., 2008; Ross & Rosser, 1996) and that spirituality is related to higher self-esteem and self-efficacy among Black MSM, promoting development of new attitudes and beliefs that decrease high sexual risk behavior, substance use, and depression (Mahaffy, 1996; Martin & Knox, 1997; Miller, 2007, Noar et, al, 2009; Stokes & Peterson, 1999).

The individual who experiences cognitive dissonance can either 1) change his/her outlook or attitudes that cause the distress, 2) vacate or avoid the environments that cause the dissonance, or
3) develop new attitudes and beliefs that diminish or eradicate the dissonance (Festinger, 1957; Mahaffy, 1996). The process of how sexual minorities seek to resolve dissonance was identified in a study involving religiosity and lesbians, who have been shown to experience a high incidence of internal dissonance when attempting to reconcile their sexual orientation, religious identity, social and religious norms, and sexual behavior (Shuck, et. al, 2001). Particularly important was that those participants with higher levels of internal dissonance tended to self-report as religious (i.e. elevated degree of religiosity), and self-report higher rates of risk behavior. Thus cognitive dissonance augmented by levels of religiosity may influence higher sexual risk behavior (Foster, et. al., 2011; Hampton, et. al, 2010).

A similar study (Jeffries, Dodge, & Sandfort, 2008), examined the experience of cognitive dissonance of Black MSM in relation to churches, religious institutions, and society. The study focused on how Black MSM cope with cognitive dissonance as they attempt to integrate their religious convictions in light of their sexuality. Findings suggested that affirmative spiritual and religious experiences may be beneficial to the psychosocial well-being of Black MSM and may decrease dissonance experienced by some Black MSM. Such affirmative, dissonance-reducing experiences could lead to lower risk among this population. Future effective HIV prevention interventions intended for Black MSM may well include dissonance reduction, as well as spirituality and religiosity components to achieve risk reduction among this population (Beatty, et. al., 2004; Davis, et. al, 2003).
Statement of the Problem

HIV and STD incidence and prevalence among Black MSM

HIV/ AIDS incidence rates for Blacks are rapidly increasing. Although Blacks account for only 13% of the total United States population, they make up approximately half of the 1.2 million Americans living with HIV/AIDS (CDC, 2009; Prejean, et. al., 2011). An estimated 1 in 16 Black males in the United States is living with HIV disease (CDC, 2009). In 2009, the CDC estimated that 73% of the 56,500 new cases of HIV were among males, and Black MSM were at increased risk (CDC, 2009; MMWR, 2012; Prejean, et. al., 2011). Black men whose sex partners include other men, (BLACK MSM), may identify as gay, bisexual, heterosexual or “other than heterosexual” (Millet, et. al, 2006; Millet & Peterson, 2009); men in these categories account for 53% of the total prevalence cases of HIV/AIDS among US males. Incidence of HIV/AIDS among young persons under age 25 is increasing among all populations and disproportionately among Black MSM, who account for 63% of young adult cases in the U.S. (CDC, 2009; Prejean, et. al., 2011).

Research indicates that increased health complications related to HIV and other STDs are associated with higher rates of poverty, increased rates of substance use, lower education, and lack of employment, particularly among Black MSM (Foster, et. al., 2011; Fullilove, 2006; Fullilove & Fullilove, 1999). Other psychosocial factors and issues correlated with increased HIV incidence among Black MSM are depression (Murray, et. al., 2007), low self-esteem (Martin & Knox, 1997;; Peterson, et. al., 1996; Peterson and Jones, 2009), high incarceration rates (; Millet & Peterson, 2007), and community norms around masculinity and manhood (Millet, et. al., 2006). These factors tend to lower the self esteem among Black MSM (Hamblin
& Gross, 2011; Martin & Knox, 1997; Miller, 2007. Lower self esteem among Black MSM decreases coping skills, including the ability to reconcile sexual orientation with religious and cultural norms, (Millet et. al, 2006; Ross, et. al., 2008), and thus increases levels of cognitive dissonance among Black MSM (Millet & Peterson, 2007; Stokes & Peterson, 1998).

Depression and substance abuse have been shown to be highly correlated with high risk sexual behavior among Black MSM (Bruce, et. al., 2012; Colfax, et. al., 2003; Klobin, et. al., 2006; Reisner, et. al., 2009; Stall, et., al., 2003; VanDevanter, et. al., 2010). Additional research shows the relationship between substance use and religion and spirituality (Dennis, et. al., 2009; Knight, et. al., 2007; Piko, et. al., 2012; Piko & Fitzpatrick, 2004) as well as depression and religiosity and spirituality (Cotton, et. al., 2005; Rasic, et. al., 2011); therefore, the relationship between religiosity, spirituality, substance use, depression and high risk behavior will also be examined in the present study.

Although HIV/AIDS prevalence, incidence, and mortality continue to increase among Black MSM (Fullilove & Fullilove, 1999), the HIV treatment community’s response has been perennially ineffective for this largely hidden, less likely to self-identify as MSM population (Fullilove, 2006; Fullilove & Fullilove, 1999; Malebranche, 2003). Treatment and prevention needs of Black MSM have often been poorly identified and overlooked by public health officials more used to working with openly gay white males (Beatty, et. al., 2004;). Lack of targeted services may be one of the factors contributing to HIV/AIDS incidence and prevalence among Black MSM (Beatty, et. al., 2004; Fullilove, 2006; Millet & Peterson, 2007). Targeted treatment and prevention services may prove more effective if they include and acknowledge spiritual and/or religious needs and affiliations shown to be important in the overall life contexts of many Black MSM.
Factors relating to increase HIV and STD incidence and high risk behavior among Black MSM

Risk and protective factors for HIV disease among Black MSM include a combination of individual, socio-cultural, and biomedical factors (Millet, et. al, 2006). In general, research supports that substance use, depression, higher background prevalence, and HIV complacency increase participation in high risk sexual behaviors among Black MSM (Martin & Knox, 1997; Miller, 2007, Millet, 2009). Research shows that these individual risk factors may create a significant additive effect, and thus MSM who have experienced more than one risk factor would be predicted to have increased negative bio-psychosocial outcomes (Folkman, et. al., 1992;; Garcia, 2005; Lorenz, et. al., 2005; Luquis, et. al., 2011).

Among Black MSM, sexual risk factors, particularly unprotected anal intercourse (i.e., “bare backing”) and sexually transmitted diseases (STDs), account for the high rates of HIV infections observed in this population (Millet, et. al, 2006; Millet & Peterson, 2007). In addition to unprotected intercourse, several factors have been identified as increasing HIV risk: successful HIV treatment that diminishes the negative impact of HIV infection and making the disease seem less severe (Ncube, et. al., 2012); substance use, which diminishes cognition to engage in safer sex ( Bruce, et. al., 2012; Colfax, et. al., 2003; Klobin, et. al., 2006; Reisner, et. al., 2009; Stall, et., al., 2003; VanDevanter, et. al., 2010) and serosorting, or engaging in sex or unprotected sex with a partner whose HIV status is known and who is then the receptive partner in the unprotected anal intercourse (UAI) behavior (CDC, 2010; Malebranche, 2003; Marks, et. al., 2009; Millet, et. al., 2006; Millet & Peterson, 2007). Higher STD incidence among MSM also serves as a risk factor because STD infections increases susceptibility to HIV thus, increasing the likelihood of HIV transmission (CDC, 2009; CDC, 2010; Millet, et. al., 2009; Ross, et. al.,
An additional risk factor for Black MSM in particular is unknown HIV serostatus, which contributes to serodiscordant unprotected anal intercourse (SDUAI) due to Black MSM not disclosing serostatus to partners or disclosing positive serostatus less frequently (Ross, et. al., 2008).

Research hypothesized that social networks impact HIV risk behavior among Black males. For example, studies by Millet and colleagues (2006 and 2009) showed that factors such as concurrent sexual partnerships, older male partners, and more Black male sexual partners significantly increased the risk of HIV infection. Concurrent sexual partners increase likelihood of exposure. Sex with older partners increased exposure risk because the prevalence of HIV is higher amongst older individuals. Sex with primarily Black MSM partners also increased risk of exposure given higher rates of HIV and STDs.

An additional HIV risk factor noted in the literature is undiagnosed HIV infection among Black MSM. Black MSM are not tested as frequently and may be aware of their HIV status (CDC, 2009; CDC, 2010; Millet, et. al., 2009). Some studies (CDC, 2009; Millet, et al, 2006) have shown that nearly two-thirds of new HIV infections are attributed to the 25% of persons who do not know their HIV status (CDC, 2009; Millet, et al, 2006; Millet & Peterson, 2007). Young Black MSM were more likely to be unaware of their infection (approximately 9 of 10 young Black MSM compared with 6 of 10 young white MSM). Of the men who tested positive nearly 74% had previously tested HIV-negative and nearly 60% of these individuals believed themselves to be low or very low risk for HIV infection (CDC, 2009; CDC, 2010). Research has shown that many people who learn that they are infected with HIV alter their behaviors to reduce risk of transmitting the virus (Marks, et. al., 2009). Therefore, increasing the
proportion of people who know their HIV serostatus can help decrease HIV transmission (Fullilove, M; Fullilove R, 2008; Millet, et al, 2006; Millet & Peterson, 2007).

Substance abuse is another HIV transmission risk factor among Black MSMs (CDC, 2009; Millet, et. al., 2006; Millet, et. al., 2009, Murray, et. al., 2007). Persons who use substances may experience lower inhibition and may engage in riskier sexual behaviors, including sex with multiple sexual partners and unprotected sexual intercourse with individuals of unknown HIV status (Malebranche, 2003; Marks, et. al., 2009). Substance use is strongly positively correlated with high HIV risk behavior among individuals who tested positive for HIV (CDC, 2009; Jeffries, et. al, 2009; Millet, et. al., 2006; Millet, et. al., 2009; Ross, et. al., 2008). Substance users often frequent environments (e.g., parks, bathrooms, bars, bathhouses) where safer sex tools are not available or not used when available (Marks, et. al., 2009; Millet, et. al., 2006). In addition to lowering inhibitions, substance users may more readily participate in higher risk behavior such as sex for money, sex during a “Blackout” and unprotected sex, particularly UAI, for money or illicit mood altering substances (CDC, 2009; Malebranche, 2003; Millet, et. al., 2006; Murray, et. al., 2007).

Complacency about HIV risk has also been shown to be a risk factor among Black MSM (Beatty, et. al., 2004; Millet, et. al., 2006). Due to the long history of the HIV epidemic and treatment and prevention fatigue, Black MSM often underestimate the impact and prevalence of HIV in this population (CDC, 2009; Millet, et. al., 2006; Millet, et. al., 2009). In addition, the success of HIV treatment, particularly highly active antiretroviral therapy (HAART), may influence some members of the population to minimize the negative aspects of living with HIV. They may deny the often difficult ancillary tasks of taking HAART medications, such as consistent adherence to treatment, high frequency of taking medication, and the high financial
and temporal costs associated with medical care and treatment (Beatty, et. al., 2004; Millet, et. al., 2006; Ncube, et. al., 2012).

The increased number of MSM, who are HIV-positive, relative to heterosexual males, also promotes a higher background prevalence of HIV in the MSM community, so that a higher percentage of unprotected sexual encounters may be experienced with MSM group members who have HIV (Beatty, et. al., 2004; Millet, et. al., 2009). Black and Hispanic men are more likely than White men to be given a diagnosis of HIV infection in the late stages of infection, often when they already have AIDS, which magnifies an increase in the background prevalence HIV and STD rates among Black MSM (CDC, 2009; CDC, 2010; Beatty, et. al., 2004; Brooks, et. al., 2005; Millet, et. al., 2009).

Several protective factors have been identified for the Black MSM population. Religious norms that promote monogamy and forbid promiscuity tend to serve as HIV protective factors in some cases (Boyd-Starke, et. al., 2011). Serosorting among Black HIV-positive men or Black HIV-positive MSM only having sex with other HIV positive Black MSM has been shown to be an effective protective factor for this population (Beatty, et. al., 2005). Serosorting with condom use may further reduce the risk of HIV transmission for serodiscordant partners in which the HIV-positive partner serves as the receptive partner (CDC, 2010; Beatty, et. al., 2005).

Adherence to HAART has also been shown to be a protective factor against transmission of HIV because individuals with lower viral loads and higher CD-4 counts have a lower capacity to transmit HIV (Boyd-Starke et. al., 2011; Beatty, et. al., 2005; CDC, 2010).

HIV risk for Black MSM is clearly a multi-faceted issue. Successful HIV risk reduction for Black MSM is likely dependent upon consideration of behavioral, social, and medical factors in the design of interventions. In order to effectively address social factors in the design of such
interventions for Black MSM, it may be particularly important to better understand the role of religion and spirituality in their overall life contexts. This study seeks to determine relationships between religious and spiritual factors and HIV risk for Black MSM to enhance the effectiveness of future HIV prevention interventions for the Black MSM population (Beatty, et. al., 2005; Miller, 2007). In order to address HIV risk prevention needs among Black MSM a review of current HIV interventions among Black MSM is important.

**Black MSM risk behavior and current HIV prevention interventions**

Few culturally sensitive, appropriate, and effective HIV prevention interventions have been developed for Black MSM (Fullilove, 2006; Peterson & Jones, 2009). Few HIV and other STD prevention programs have looked at knowledge, attitudes, beliefs, and behaviors specific to Black MSM sexuality and sexual orientation (Peterson & Jones, 2009). Notably lacking are initiatives that specifically focus on changing underlying negative attitudes and beliefs that potentially contribute to high-risk sexual behaviors among Black MSM (Fullilove, 2006; Peterson & Jones, 2009). Several studies have found the internalized barriers of stigma, shame; low self-esteem and homophobia create an atmosphere of silence around male-to-male sexual behaviors that lessens the impact of HIV prevention education interventions (Martin & Knox, 1997; Noar et, al, 2009; Ross, et. al., 2008).

Although older HIV educational interventions were generally funded to impact specific prevention efforts of abstinence and “Just Say No” about sexual intercourse, very few looked at knowledge, attitudes, beliefs, and behaviors around Black sexuality and sexual orientation. Particularly lacking were diffusion of effective behavioral interventions (DEBIs) that specifically focused on changing attitudes, beliefs, as well as high-risk behaviors due to intrinsic
internalized barriers of stigma, shame, and homophobia that created an atmosphere of silence around homosexuality (Fullilove, 2006; Malebranche, 2003; Miller, 2007; Millet & Peterson, 2007).

New leadership at the CDC’s Division of HIV/AIDS (DHAP), ultimately charged with sexually transmitted infection (STI) prevention in the United States, has increased sustained focus on HIV prevention prevailed a campaign entitled “Prevention is Care” (CDC, 2009). Attention and prevention efforts now focus on designing, evaluating, and implementing DEBIs that incorporate behavioral health science to change targeted risk behaviors among Black MSM populations. Three DEBI interventions have been designed specifically targeting Black MSMs: (1) Many Men, Many Voices, (2) MPowerment, and (3) D-Up! Only D-Up! specifically promotes self-efficacy related to condom use, and D-Up! is the only one of the interventions that was initially designed for and by Black MSMs. The other two interventions were primarily for white MSMs and then adapted for minority populations (CDC, 2009). The latest round of funding targeting Black MSM populations included Personalized Cognitive Risk Reduction Counseling (PCC), which is a one hour, one-on-one counseling session designed to reduce HIV sexual risk behavior and tailored for HIV-negative Black MSM who get tested for HIV multiple times a year (CDC, 2011). All of these prevention interventions though targeted mainly for Black MSM do not include religiosity or spirituality as primary prevention components.

Many Men, Many Voices Many (3MV) is a 7-session, group-level intervention program to prevent HIV and sexually transmitted diseases among Black MSM who may or may not self-identify as gay. The intervention addresses factors that influence the behavior of Black MSM: cultural, social, and religious norms; interactions between HIV and other sexually transmitted diseases; sexual relationship dynamics; and the social influences that racism and homophobia
have on HIV risk behaviors. PCC can be incorporated to this DEBI and has been shown to enhance its effectiveness among Black MSM (CDC, 2009). MPowerment is a community-level intervention for young MSM that uses a combination of informal and formal outreach, discussion groups, creation of safe spaces, social opportunities, and social marketing to reach a broad range of young gay men with HIV prevention, safer sex, and risk reduction messages (CDC, 2009).

Lastly, D-Up *Defend Yourself!*, is a community-level intervention designed for and developed by Black men who have sex with men. D-Up was designed to promote condom use as a social norm and to assist Black MSM to recognize and handle risks related to racial and sexual bias. Brothers Keeping Brothers Safe is the term coined as part of the D-Up intervention, for Black MSM persuading one another to practice safer sex to reduce transmission of HIV and STDs. This prevention intervention is primarily based on the belief that if there is a change in the social norms of peer leaders then there will be a modification in the norms of the peer’s social network partners (CDC, 2009).

Although evaluations of these three interventions have shown positive effects on HIV risk behaviors among MSM (CDC, 2009), HIV incidence and prevalence rates for Black MSM remain disproportionately high, as it is 28% of Black MSM were HIV-infected, and 59%, were unaware of their infection.

The continued increase in HIV incidence primarily among Black MSM despite continued and innovative HIV prevention interventions suggests other cultural and social factors, including spirituality and religiosity, may be important issues related to HIV risk and increase HIV incidence among Black MSM (Beatty, et. al, 2004; Fullilove, 2006; Peterson & Jones, 2009). Other constructs, such as poverty, substance abuse, and depression, and their potential correlations between HIV incidence and the Black MSM target population have been studied in
prior research (Beatty, et. al., 2004; CDC, 2009; Millet, et. al., 2006). Given the significant association of religion and spirituality among Blacks (Pew, 2008; Pitt, 2010), there exists a significant gap in the literature regarding the relationship between HIV risk behavior, religiosity and spirituality; especially how these constructs affect high risk behavior among Black MSM. Future research could benefit from examining the relationship of these constructs to ascertain, which factors may contribute to the increasing HIV incidence among Black MSM. Therefore this study proposes to examine the relationship between religiosity, spirituality, substance abuse, depression, and high risk behavior among Black MSM (Beatty, et. al, 2004; Fullilove, 2006; Millet, et al, 2006; Millet & Peterson, 2007, Peterson & Jones, 2009).
Gaps in Research

*Conceptual framework addressing the gaps involving religiosity and spirituality in health research among Black MSM*

Although existing literature addresses religion and its relation to Blacks and their overall health, there is a significant gap in published research regarding religion, spirituality and health among Black MSM. Few studies have examined the impact of religious and spiritual norms on sexual behavior in the Black community, particularly among Black MSM. Given the strong cultural factors of religion and spirituality among Blacks in general, the research gap regarding ways in which HIV risk behaviors may be related to Black MSM individual practice of and experience of religiosity and/or spirituality is significant (Jeffries, et al, 2008; Miller, 2008).

Because a few studies have examined how religion and spirituality positively affect health outcomes of persons living with HIV (Davis, et al., 2003; Coyle, 2001) and several other studies have identified spirituality and religion and other factors such as socio-economic class (SES), substance abuse history, racism, homophobia, higher incarceration rates, and individual sexual identity are correlated with high risk behavior among Black MSM (Davis, et al., 2003; Delaney, 2005; Jeffries et al, 2008, the proposed study will inform future HIV risk reduction interventions for Black MSM by examining relationships between religious and spiritual practices, demographic variables (e.g., age, substance use, self-reported depression scores), and HIV risk behaviors.

Although more recent studies tend to support differences in the terms “religion” and “spirituality” (e.g., Miller, 2007), many prior studies involving Black MSM have used the terms
religion and spirituality interchangeably and tend to define and interpret the two constructs as being very similar (Davis, et al., 2003; Delaney, 2005; Coyle, 2002). Because these two constructs have been identified as overlapping it is best to clearly define and measure them in studies to ascertain their impact, if any, on health behaviors (Davis, et al., 2003; Coyle, 2001; Miller, 2007).

Because recent research has operationalized religiosity and spirituality differently and concluded various effects on health behaviors, these two constructs will be examined separately in this proposal. The proposed study will operationalize “religion” and religiosity as referring to the formal set of beliefs and practices affiliated with an acknowledged religious authority, and ”spirituality” will be operationalized as a personal experience or feeling of connectedness with a higher being. Several studies found that religion and was positively associated with higher levels of HIV risk (Boyd-Starke, et. al, 2011; Foster, et. al, 2011; Hampton, et. al, 2010; Miller, 2007) while other studies (Coyle, 2002; Dalmida, 2006; Dalmida, et.al, 2006; Davis, et. al., 2003; Kegeles, 2009) found spirituality correlated with lower levels of HIV risk behavior; therefore, it is important to operationalize religion and spirituality as two different constructs. Further research showed that spirituality is associated with more healthy/less risky behaviors and higher levels of overall general well-being, (Cotton, et. al., 2006; Coyle, 2002; Gray, 2002; Koenig, et. al., 2004; Miller, 2007 than is religiosity (Boyd-Starke, et. al., 2011; Foster, et. al., 2011).

To better explain the relationships between religiosity, spiritually, and high risk behavior among Black MSM, Cognitive Dissonance Theory will guide the analysis of the associations between the independent variables of religiosity and spirituality as well as the covariates of substance abuse and depression (Aronson, 2007; Hardy & Raffaelli, 2003). Figure 1 is the model
that illustrates how this study will address these gaps in research and proposed relationships of the operationalized constructs.
Figure 1

(Proposed model relating religiosity, spirituality, cognitive dissonance, and HIV risk behavior, substance abuse and depression among Black MSM).
Using cognitive dissonance theory in addressing religiosity and spirituality

The model in Figure 1 is based on the cognitive-behavioral model of the relapse process (e.g., re-engagement in using alcohol and other drugs, or practicing other risk behaviors). The cognitive behavioral model of the relapse process presents a theory that explains why a practiced healthy behavior is no longer maintained, and often includes interpersonal conflict and social pressures which moderate an individual’s coping response to the situation (Larimer, Palmer, and Marlatt, 1999). For the proposed study, the model has been modified to show how cognitive dissonance theory and HIV risk behavior among Black MSM are related by incorporating the constructs of religiosity and spirituality. The model is based upon the knowledge, attitudes, and beliefs that Black MSM experience because of their sexual orientation. A significant percentage of Black MSM experience a higher level of emotional stress due to the stigma, shame, and homophobia, and often they experience these from Black religious congregations (Kegeles, et. al., 2011). Given the proposed model, these messages are internalized and cause internal conflict known as internal dissonance (Foster, 2011; Mahaffy, 1996; Miller, 2007).

The proposed dissertation is designed to identify associations among measures of religiosity, spirituality, HIV risk behavior, substance abuse, and depression in Black MSM to answer the following three research questions:

Research question #1: What is the relationship of religiosity and spirituality in Black MSM?

Research question #2: What is the relationship of religiosity, spirituality, and high risk behavior in Black MSM?

Research question #3: What is the relationship of religiosity, spirituality, substance abuse and depression in Black MSM?
The dissertation will be comprised of three related manuscripts:

**Manuscript #1: The Relationship of Religiosity and Spirituality in Black MSM.** This paper will be an analysis of the relationships between religiosity and spirituality with the sexual risk behavior, substance use, and depression variables to generally describe religiosity and spirituality.

**Manuscript #2: The Relationship of Religiosity, Spirituality, and High Risk Behavior in Black MSM.** HIV risk will be sub-analyzed using the subcategories of condom use, HIV-infection status, sexually transmitted disease (STD) status, and recent unprotected anal intercourse (UAI) behavior and the correlations between these variables will be discussed in terms of religiosity and spirituality through multiple logistic regression analysis among Black MSM.

**Manuscript #3: The Relationship of Religiosity, Spirituality, Substance Abuse and Depression in Black MSM.** This paper will examine the associations of religiosity, spirituality, substance use, and depression in Black MSM using logistic regression analysis.

These papers will provide initial investigation within a theoretical framework of cognitive dissonance to examine high risk sexual behavior among Black MSM and the potential impact of religiosity and spirituality on the health behaviors (high sexual risk behavior, substance use and depression) of Black MSM. Data will be presented in the approved three-paper format for the dissertation requirement rather than as the traditional chapters 4 and chapter 5 of a dissertation.
LITERATURE REVIEW

Previous Studies

Operationalizing and Measuring Religion and Spirituality in Health-related Research

Measurement and conceptual issues have been key issues in research relating religion and/or spirituality to overall health and health-related behaviors. Many studies have operationalized these constructs in similar often overlapping ways, while several recent studies tend to operationalize these constructs as separate and distinct measures. Although religion and spirituality as concepts may often overlap, recent research that has operationalized them distinctly classifies “religion” as the formal set of beliefs and practices affiliated with an acknowledged religious authority or a fixed system of ideas and ideological commitments representing a formal, outward, doctrinal, and authoritarian system (Davis, et al, 2003; Coyle, 2001; Hill & Pargament, 2003; Miller, 2007). Behaviors typically identified as “religious” include overt visible acts such as praying before meals, attending worship services, and reading sacred texts (Davis, et al, 2003; Coyle, 2002). Spirituality tends to be defined in terms of individual, personal experience that is subjective and emotion-based, rather than as a response to pre-determined religious institutions and dogma (Hill & Pargament, 2003). “Spirituality” typically is defined as a personal experience or feeling of connectedness with a higher being or the subjective, personally experienced qualities one perceives as part of one’s relationship with an otherness, higher power, or God. Spirituality is also sometimes broadened to include the search or path for transcendent meaning (Davis, et al, 2003; Coyle, 2002; Miller, 2007).
More recent research has focused on the importance of better understanding differences between the constructs and their relationships to health and other quality of life measures (see Richmond, 2004 for a review). Work by Richmond (2004), Miller and Thoresen (2003), and Hill and Pargament (2003) focused on the need to clearly define spirituality and religiosity as well delineated constructs when conducting research involving health behaviors and health outcomes. In particular, Miller & Thoresen (2003) describe the basis for conducting spirituality and religiosity and health research and suggest categorizing these constructs as either risk and/or protective factors as a means of mitigating bias when conducting research because data suggest that religion and spirituality are not appropriately viewed as synonymous in relation to HIV and related risk behaviors.

For example, several studies found that religion and was positively associated with higher levels of HIV risk behaviors (Boyd-Starke, et. al, 2011; Foster, et. al, 2011; Hampton, et. al, 2010; Miller, 2007) while other studies (Coyle, 2002; Dalmida, 2006; Dalmida, et.al, 2006; Davis, et. al., 2003; Kegeles, 2009) found that spirituality correlated with lower levels of HIV risk behavior. Further research shows that spirituality is associated with more healthy/less risky behaviors and higher levels of overall general well-being, (Cotton, et. al., 2006; Coyle, 2002; Gray, 2002; Koenig, et. al., 2004; Miller, 2007 than religiosity (Boyd-Starke, et. al., 2011; Foster, et, al., 2011). These conflicting results suggest that it is important to operationalize religion and spirituality as two different constructs. This may be particularly the case in relation to understanding the role of each construct with Black MSM populations, given the potentially important role of each in the overall life context of population members.
Table 1-Spirituality and Religiosity Scales Used in Public Health Research describes the most common religion and spirituality scales used in health research articles and also presents the strengths and weaknesses of each:

<table>
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<tr>
<th>Scale</th>
<th>Brief Description</th>
<th>Strengths</th>
<th>Weaknesses /Challenges</th>
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<tr>
<td>Brief Multidimensional Measure of Religiousness/Spirituality (BMMRS) (Harris, S., et. al., 2008; Johnstone, B., &amp; Yoon, D., 2009; Johnstone, B., et. al., 2009; Luquis, R., et. al., 2011; Murray, K., et. al., 2007).</td>
<td>A 38-item measure originally published in 1999 and revised in 2003 that examines 12 dimensions of religiosity and spirituality; developed by the Fetzer Institute and the National Institute on Aging (NIA).</td>
<td>Widely used instrument; in measuring several dimensions of both religiosity and spirituality as overlapping constructs in the general population; useful in measuring several domains of religiosity and spirituality: Daily spiritual experiences, Meaning, Values, Beliefs, Forgiveness, Private religious practices, Religious/spiritual coping, Religious support, Religious/spiritual history Commitment, Organizational religiousness, and Religious preference</td>
<td>The instrument has no empirically validated total score; therefore users must match individual domains and develop individual domain scores to find meaning within individual domains (church attendance, religious support, etc.)</td>
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<td>Duke University Religious Index (DUREL) (Cotton, S., et. al., 2006; Kudel, I., et. al., 2011)</td>
<td>Composed by the Religious Department of Duke University to develop a universal measure of religious activity for use in research.</td>
<td>5-item measure that assess organized religious activity and has an existing method designed by the developers to obtain a global score from the 5-items.</td>
<td>5 items may not adequately test religiosity and may not be consistent among different populations given religious cultural differences. Instrument only measures one dimension of religiousness/spirituality.</td>
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<td><strong>Spiritual Index of Well Being (SIWB)</strong> (Daaleman, T., et. al., 2002).</td>
<td>The initial version contained 40 items and through factor loading analysis a 12-item scale was developed. Scale was specifically designed to examine the relationship of spirituality and subjective well being.</td>
<td>Originally designed to be utilized in health related studies to measure the relationship between subjective quality of life and individual spirituality. Contains 12 items that load consistently well in factor analysis models.</td>
<td>Scale examines subjective well-being and quality of life and does not directly examine other dimensions of religion or spirituality.</td>
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<td><strong>Spirituality Scale</strong> (Delaney, C., 2005).</td>
<td>Is a holistic assessment survey that focuses on the beliefs, institutions, lifestyle choices, and ceremonies that represent the human spiritual dimension</td>
<td>Involves the Social Cognitive Theory by examining the individual’s connected with their environment, other persons, and their search for meaning. The scale is composed of 23-items that attempts to measure different aspects of an individual’s holistic perception of their spirituality. This scale is designed to be used to guide spiritual interventions.</td>
<td>Twenty-three item scale does not measure clear dimensions of religiosity or spirituality. No global scoring available.</td>
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<td><strong>Intrinsic Spirituality Scale (ISS)</strong> (Hodge, D., 2003).</td>
<td>The 6-item ISS assesses the degree to which spirituality functions as a motive in theistic and non-theistic populations and in religious and non-religious frameworks.</td>
<td>Specifically designed for use in theistic and non-theistic populations. Clearly defines spirituality (vs. religion) and was developed with standard scoring. Given its brevity can be easily validated with other measures.</td>
<td>Scale has not been extensively tested and validated in health research. The items do not describe specific domains that are measured thus interpreting results from scores involves more insight than other scales.</td>
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<tr>
<td><strong>Embodied Spirituality</strong></td>
<td>42-item measure developed to examining the relationship</td>
<td>Has been used in studies examining the relationship</td>
<td>Does not readily measure</td>
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<td>Scale (ESS) (Horn, M., et. al., 2005)</td>
<td>ascertain the level of integration of one’s sexuality and spirituality. The idea of integration of mind, body, and spirit is critical to effective spiritual interventions and assessments.</td>
<td>between spirituality and sexuality. Gives useful definitions of spirituality and religion and context for conducting health research. ESS has primarily been used with hetero-identified “Christian” populations and has been shown to offer insight to the nature of the motivating factor between spirituality and health.</td>
<td>dimensions of religiousness/spirituality but sexual and spiritual integration as a motivator for positive health outcomes.</td>
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<td>Ironson Woods Spirituality Religiousness Index (IWSI) (Ironson, G., et. al., 2002).</td>
<td>22-item instrument associates both spirituality and religiousness, and health for people living with HIV and examines the potential mediators of these relations</td>
<td>ISWI specifically measures four religious dimensions: Sense of Peace, Faith in God, Religious Behavior, and Compassionate View of Others, and relates these scores to health outcomes. Scale was specifically determined to be reliable and valid in conducting research on spirituality and HIV. Clearly highlights the correlation between religiosity and spirituality and health outcomes.</td>
<td>Has been applied only to HIV-positive populations after their HIV-diagnoses. The IWSI is a 22-item subscale paired down from an original 89 item scale therefore scoring and statistical inferences must be analyzed in context of the population used.</td>
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<td>Hodge Intrinsic Religious Motivation Scale (HIRMS) (Berry, D., et. al, 2011;</td>
<td>10-item scale designed to measure the extent that religion and spirituality has on individual internal meaning.</td>
<td>HIRMS gives a clear definition and discussion on religiosity and has been validated with other measures.</td>
<td>Originally developed in 1972 and only measures intrinsic versus extrinsic religiosity. Has not been applied to health research.</td>
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<tr>
<td>Spiritual Involvement</td>
<td>The Spiritual Involvement and SIBS was intended to be used among participants</td>
<td>Dichotomized responses (agree</td>
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<td>Spiritual Meaning Scale (SMS)</td>
<td>Beliefs Scale (SIBS) is a 26-item one dimensional measure that assesses spiritual involvement, activity and beliefs, making a distinction between spirituality and religiosity.</td>
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<tr>
<td>(Berry, D., et. al, 2011;)</td>
<td>Beliefs Scale (SIBS) is a 26-item one dimensional measure that assesses spiritual involvement, activity and beliefs, making a distinction between spirituality and religiosity.</td>
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<td>of different faiths and has several advantages such as describing God (Higher Power) with a broader scope, using terms that avoid cultural-religious bias, and assessing both beliefs and actions of participants.</td>
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<td>SIBS is purported to have good reliability and validity.</td>
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<td></td>
<td>or disagree; and always, usually, or sometimes) do not always lend themselves to capture accurate responses to questions from participants and forces them to choose responses that may not be accurate.</td>
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<td></td>
<td>SIBS has not been frequently used in health research.</td>
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<tr>
<th>Spiritual Well Being Scale (SWBS)</th>
<th>SWBS was created to ascertain</th>
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<td>(Berry, D., et. al, 2011;)</td>
<td>A strength of the SWB is that its validity has been well established and fully supported in research.</td>
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<td>Belief About God Scale (BAGS)</td>
<td>Relatively short and simple scale.</td>
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<td>(Berry, D., et. al, 2011;)</td>
<td>Has not been validated psychometrically and is unpublished. Does not contain global scoring.</td>
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<td></td>
<td>Has not been used primarily in public health research because</td>
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Several studies have operationalized religiosity and spirituality differently in public health research. For example, Johnstone and colleagues (2009) developed a 6-factor model for the BMMRS that measured these constructs by strongly supporting the incorporation of both positive and negative, (or history of unfavorable interactions with a higher power or religious entity), spiritual and religious experiences and practices. This study found positive spiritual experiences were related to better physical health and negative spiritual experiences were associated with worse mental and physical health outcomes. Another study, Foster and colleagues (2011), presented the role of religion and spirituality in men who have sex with men (MSM) in the San Francisco Bay Area. Religiosity was measured by self-reported church attendance, and spirituality was measured via one self-report question. A significant association
was found among religiosity and HIV status. All the participants who reported attending
traditional conservative churches self-reported being HIV-positive, and none of the men who self
reported being HIV-negative continued to attend traditional churches but opted to attend gay-
affirming congregations or not attend services at all. Additionally, nearly all the men
considered themselves spiritual, yet only half of them, regardless of HIV status, disengaged from
formal religious environments altogether. Another recent study, Boyd-Starke and colleagues
(2011), measuring spirituality among Black students, found a positive correlation between
increased HIV incidence and higher levels of religiosity in Black religious communities. This
study examined how dimensions of religiosity and spirituality influenced HIV risk behaviors.
Certain religious acts such as church attendance and prayer were not significantly correlated with
HIV risk behavior; however, participants with higher levels of spirituality had lower levels of
HIV risk (e.g., less likely to engage in substance use/abuse or to have multiple sexual partners).
In summary, these data showed varied measures of religiosity and spirituality constructs;
however, they all illustrated some associations between religiosity, spirituality, and related
health behaviors among Black MSM.

Several studies have used measures listed in Table 1 to measure religiosity and
spirituality among different populations (e.g., Boyd-Starke, et. al, 2011; Cotton, et. al., 2006;
Coyle, 2002; Foster, et. al, 2011; Gray, 2002; Hampton, et. al, 2010; Koenig, et. al., 2004;
Miller, 2007). Despite a wealth of general population (almost exclusively heterosexually
focused) studies, no “gold standard” measure has been identified for the measurement of religion
and spirituality. This makes the task particularly difficult for examining these constructs among
special populations, such as Black MSM. Studies described earlier have found that spirituality
and religiosity, when examined as separate constructs, are differentially associated with HIV risk
behavior, substance abuse, and depression. Therefore, religiosity and spirituality will be operationalized as separate constructs for this project to better ascertain the relationship of these constructs to HIV risk and related behaviors among Black MSM.

*Relationships between Spirituality, Religiosity, and Health*

The literature supports links between both religion and spirituality and positive health outcomes (e.g., Delaney, 2003; Hill & Pargament, 2003; Miller & Thoresen, 2003; Seybold & Hill; 2001), and generally more medical professionals are changing their belief that religion and spirituality have links to health status (Astrow et al., 2001). Olive (2004) found through a literature review process negative associations between religiosity and spirituality variables and lower levels of mortality, depression, and substance abuse and successful coping with chronic illnesses such as HIV and cancers. The author suggests the need for future research to separately examine the effects of the constructs of religion and spirituality on potential health outcomes. Supporting this idea, Hart (2008), in a comprehensive review studying the association of religion/spirituality and health, found that religion and spirituality can have both a positive (protective/preventive) effect and a negative (increasing risk) effect on health behavior and health outcomes. Hart defined spirituality as practices and beliefs that gave people a sense of meaning or purpose in their lives and religion and “religious behaviors” as a more formalized and organized set of rules and governance. Hart found that, of the more than 1,200 studies examining the relationship between spirituality, religiosity, and positive health outcomes, most reported positive association between spirituality and positive health behaviors, such that religion was not always associated with positive health outcomes, but spirituality was found to have a positive association in the majority of the studies examined.
Levels of spirituality can influence health outcomes as well as health behaviors. Cotton and colleagues (2005) were the first to examine changes in levels of spirituality and health outcomes among HIV-positive participants longitudinally using a sample of 450 participants from four clinical sites. Spirituality was assessed using three measures: 1) the Duke Religion Index (DUREL), a 5-item measure that assess organized religious activity; 2) the Functional Assessment of Chronic Illness Therapy-Spirituality-Expanded (FACIT-SpEx) measure, a 23-item measure of spirituality, peace, and meaning of life; and 3) the Brief RCOPE, a 14-item measure assessing both positive and negative religious coping. This study also examined social support (using the 12-item Brief Interpersonal Support Evaluation) and depressive symptoms (using CESD-10). Results showed that participants with higher spirituality scale scores (e.g., greater self-endorsed personal spirituality) had lower rates of significant depressive symptoms, fewer HIV symptoms, and better overall functioning. In a similar study (Kudel, et. al, 2011) found that higher levels of both spirituality and religiosity were indirectly associated with better mental health outcomes which were in turn associated with positive physical health outcomes. The final good fit model illustrated that higher levels of both religiosity and spirituality, measured as overlapping constructs, predicted increased religious coping, social support, lower depressed mood, and lower fatigue. Analyses illustrated that religiosity and race predicted spirituality and religiosity and religious coping differently. For example, among minority participants, higher levels of religiosity were found and religiosity was positively associated with higher levels of spirituality and religious coping. This highlights potential associations between levels of religiosity, spirituality and race.

Other studies found an association between religiosity and health outcomes. Ridge, et. al. (2008) identified religion as a significant coping strategy among Black Africans dealing with
perceived negative health outcomes, particularly HIV illness; however, Mbonu, et. al. (2009) used a literature review process, and identified religion and coping strategies as factors moderating health seeking behaviors. They found that not all religious/spiritual experiences have beneficial effects, suggesting a much more complex relationship than previously believed. Conclusions showed a significant relationship between religiosity and HIV related stigma that impeded self care seeking behaviors among participants.

Contrasting with these findings, Miller and Thoresen (2003) found through a literature review of persons living with chronic illnesses (HIV and cancers) and older Americans that both spirituality and religion served as protective factors and were positively correlated with positive health outcomes such as overall ratings of good health, less disease, greater inner peace, and a fuller sense of life meaning. Two consistent studies, Johnstone & Yoon (2009), and Johnstone and colleagues (2009) examined the relationship between positive and negative spiritual and religious experiences and physical and mental health in a cross-sectional sample of 118 persons living with chronic health issues (e.g., brain injury, spinal cord injury [SCI], cancer, stroke, primary care conditions). They found that positive spiritual experiences and willingness to forgive were related to better physical health, while negative spiritual experiences and negative religious experiences (i.e. possessing a history of an unfavorable view of religion and/or spirituality) were associated with worse mental and physical health outcomes. Additional research (Coleman, 2003) supported positive correlation between spirituality and mental and physical health among HIV positive persons. The authors concluded that spirituality, sexual orientation, age, and HIV symptoms were strongly associated with mental well-being and functional health status. In a cross-sectional study of the effects of spirituality on the spiritual and mental health of persons living with HIV (N = 46), Litwinczuk and Goh (2007) found that
higher levels of spirituality were significantly correlated with general well-being and purpose in life, suggesting that spirituality is positively correlated with health status. Similarly, Hart (2008), in a comprehensive review studying the association of religion/spirituality and health, found that religion and spirituality can have both a positive (protective/preventive) effect and a negative (increasing risk) effect on health behavior and health outcomes. Hart defined spirituality as practices and beliefs that gave people a sense of meaning or purpose in their lives and religion and “religious behaviors” as a more formalized and organized set of rules and governance. Hart found that, of the more than 1200 studies examining the relationship between spirituality, religiosity, and positive health outcomes, most of these studies reported positive association between spirituality and health behaviors, such that religion was not always associated with positive health outcomes, but spirituality was found to have a positive association in the majority of the studies examined.

Two studies, (Ironson and colleagues 2002; and Ironson, Stuetzle, & Fletcher, 2006) further support the hypothesis of an association between religiosity and spirituality and positive health outcomes among HIV-positive MSM. Ironson and colleagues (2002) identified several spiritual factors that were strongly associated with a positive health outcome (longer term HIV survival): 1) sense of peace, 2) faith in God, and 3) compassionate view of others. Higher scores on spirituality factors also were associated with lower distress, increased hope, and positive social support. High risk behavior was positively associated with depression and stress. Ironson, Stuetzle, and Fletcher (2006) asked HIV-positive MSMs to respond to the question: “Compared to before you were HIV positive, did you become (more/less) religious/spiritual after you found out you were HIV positive?” Those persons who reported becoming more religious/spiritual after receiving a diagnosis of HIV disease had higher CD4 cell counts (denoting better overall
health status) and significantly lower HIV viral loads (denoting better HIV disease suppression). For every unit of increase in religion/spirituality there was a preservation of 1.39 CD4 cells. Those patients who became less religious/spiritual after diagnosis experienced a 4.5 time higher loss of CD4 cells. These findings clearly highlight a correlation between religiosity and spirituality and health outcomes, although this study measured the two as overlapping constructs. Since other studies define these constructs differently, future studies can analyze these constructs separately to better understand the relationship between religiosity, spirituality, and health outcomes.

In a study by Koenig (2004) spirituality and religiosity was found to be related to the length of stay (LOS) of patients older than 50. Using a convenience sample of 2,477 patients at the Duke University Medical Center, researchers measured physical health and religiosity through religious participation. Data showed that religion and spirituality did not predict LOS among participants, but patients rated by observers as more spiritual (as opposed to religious) and those with higher daily spiritual experiences (DSE) scores were hospitalized for fewer days and requested fewer medical procedures. These findings illustrate a relationship between spirituality and religion and health outcomes and suggest different pathways by which the two may operate.

Research involving religiosity, spirituality, and HIV risk behaviors

Research suggests an association between religiosity, spirituality and HIV risk behaviors. In a 2011 study by Sutton and Parks, the disproportionate rate of HIV/AIDS incidence in Black and Hispanic communities, as well as the increased likelihood of members of these communities to report formal religious affiliations when compared to non-Hispanic whites, was
presented. Compared with non-Hispanic White participants, Black and Hispanic participants were more likely to report being religious and also reported higher HIV risk behaviors. This study highlights the association of religiosity and spirituality and high risk behavior in racial minority populations. In a recent study Boyd and colleagues (2011) examined relationships between dimensions of religiosity and spirituality and HIV risk behaviors. A convenience sample of 256 African American students ages 18-25 from two historically Black colleges was administered the CDC's Youth Risk Behavior Survey (YRBS), (i.e., unprotected high risk sexual behavior, alcohol, drug, and tobacco use) and the Expressions of Spirituality Inventory (ESI), (MacDonald, 2000), which measures five dimensions of spirituality and was defined as a personal quest for understanding of life and meaning of a relationship with the sacred or transcendent. Participants with higher levels of spirituality had lower levels of HIV risk specifically fewer partners and a less likelihood of engaging in substance use and abuse. These studies highlight the relationship between religiosity, spirituality, and high risk behavior and promote the idea that similar associations may be found in other populations.

Additional studies relating religiosity and spirituality and high risk behaviors found significant correlations between the constructs of religion and/or spirituality. Luquis and colleagues (2011), described associations between religiosity, spirituality, and sexual risk behavior among college students. The study defined religiosity as religious practices such as church attendance, prayer before meals, and Bible reading and spirituality as perception of interconnectedness with the divine, including through connection to nature or service to others. Using a convenience sample of 960 college students enrolled at four northeastern US universities, complex relationships were found between sexual attitudes, religiosity, and spirituality. The study measured spiritually and religiosity as overlapping constructs using the
BMMRS, and found that on this measure both spirituality and religiosity were highly correlated with sexuality variables. Specifically, for both males and females, sexual intercourse and number of sexual partners were related to both religiosity and spirituality. For males only, private religious practices, and daily spiritual experiences contributed to the differences in high sexual risk behavior. Thomas and Freeman (2011), in a study involving self-reported religiosity and spirituality among high sexual risk taking Black females, found that a high degree of religiosity and spirituality did not correlate with lower risk behaviors among participants. Further analysis indicated a duality among participants who reported higher religiosity and spirituality scores such that several participants reported higher sexual risk taking behaviors and high-risk drinking behaviors. Conversely, in a study among older Blacks, Wutoh, and colleagues (2011), found that individuals with higher scores on a spirituality scale self-reported lower HIV risk behaviors, suggesting that spirituality may be negatively correlated with HIV risk behaviors. This is consistent with other prior studies that found negative correlations between high risk sexual practices and spirituality (e.g., Murray et al., 2007). Murray and colleagues (2007) examined relationships among spirituality, religiosity, and sexual behaviors among multiple dimensions of religion/spirituality, sexual attitudes and behavior, and shame and guilt among liberal art college students at a Northeastern US Catholic college. Findings showed spirituality was negatively correlated with engagement in high risk sexual behavior and those who self-identified as “closer to God” or more spiritual were less likely to have had sex after use of alcohol or drugs. Persons with a higher degree of spirituality w found to be correlated and/or predictive of higher sexual risk behavior in that those with lower spirituality scores reported greater alcohol and drug use than those with higher levels of spirituality.
Studies involving religiosity, spirituality, and high risk behavior among Black MSM

Although more research is needed, a modest literature has investigated relationships between religiosity, spirituality, and HIV risk behavior among Black MSM. One study, (Davis, Aidala, and Lee, 2003) examined the role of religiosity and spirituality among HIV-positive Black MSM in New York City. Religion was defined as the formal set of beliefs and practices affiliated with an acknowledged religious authority, and spirituality was defined as a personal experience and sense of connectedness with a higher being or the search for transcendent meaning. Participants responded to questions on religiosity and spirituality, and a religious profile was created for each participant that included background or religious history (i.e. positive and negative religious experiences). Physical health was measured through self-reported CD4 counts and HIV viral load levels. Mental health was assessed using a standardized measure of mental and physical health functioning (e.g., MOS-SF36). Results showed that MSM who used alcohol and other drugs had lower religiosity and spirituality scores compared to those who did not. Religiosity was significantly positively correlated with CD4 Count (e.g., a marker of overall health status among persons living with HIV disease). Participants with higher CD4 counts had higher spirituality scores, and those with the lowest CD4 Counts gave less importance to religion and participation in religious events. Religious profile scores were more associated with mental health than with physical health and functioning. Similarly, Folkman, and colleagues (1992) examined relationships between spirituality, religion, and high risk sexual behavior (unprotected anal intercourse [UAI]) among Black MSM. High risk sexual behavior was measured by self-report of UAI, dichotomized to engagement in UAI in the previous month or not. Spiritual beliefs were assessed with four items developed by the Berkeley Stress and Coping Project (Folkman, Lazarus, Guren, & DeLongis, 1986), and spiritual activities were assessed by
self-report answers to five questions. Results indicated spirituality was negatively correlated with UAI. These findings support a negative correlation between spirituality and high risk behavior among MSM; thus, spirituality was found to be a protective factor against high risk sexual behavior. A study by Kegeles and colleagues (2009) found, using semi-structured interviews among young Black MSM, religiosity (measured through church attendance) was positively associated with HIV risk taking behavior, and for this study, religiosity was a risk factor among Black MSM. In summary, these data clearly show varied measures of religiosity and spirituality constructs and suggest complex and important associations between the measures of the constructs and HIV and related health behaviors among Black MSM.

*Literature relating religiosity, spirituality, HIV risk, substance abuse, and depression to high risk behavior among Black MSM*

Several studies highlight the relationship between religiosity, spirituality, HIV risk, substance abuse, and depression among populations. Dalmida and colleagues (2011) examined how HIV-positive females enhanced their psychological well-being, thus minimizing depressive symptoms and improving health-related quality of life (HRQOL), using spirituality. Findings showed a clear negative correlation between spirituality and depression and a positive correlation between spirituality and positive physical health outcomes.

Other research identified significant associations between religiosity, spirituality, higher HIV risk, and depression among Black MSM. Ryan and Fiorito (2010) found positive relationships between spirituality and psychosocial well-being (i.e. less levels of depression). Ross and colleagues, (2008), found that depression and high risk behavior among Black MSM participants was highly positively associated with religiosity. Similarly, a recent study by
Hamblin and Gross (2011) found that higher incidence of generalized depression symptoms among Black MSM was correlated with attendance at homophobic religious congregations. In a cross-sectional analysis of 259 gay and bisexual identified males recruited at a large northeastern pride festival, Hampton, Halkitis, and Mattis (2010) examined differences between HIV-positive and HIV-negative participants in relation to active religious coping, avoidant coping strategies (specifically illegal substance use), depression, and anxiety. Findings suggested that those respondents who reported participating in high-risk sexual behavior had higher mean scores for religiosity, depression, anxiety, and substance abuse. This study supports the idea that religiosity may be positively correlated with high risk behavior, depression, and substance use among Black MSM. Similarly relating religion, spirituality, HIV risk and substance abuse; Purcell, and colleagues (2005) found that among Black MSM marijuana and alcohol use were highly correlated with depressive symptoms (stress and anxiety) and high sexual risk behavior.

Peterson, Folkman, & Bakeman (1996) found that depression along with religiosity and spirituality were correlated with high sexual risk behavior among Black MSM. Religiosity was negatively correlated with depression. When religiosity was examined in relation to high risk sexual behavior and depression, religiosity was then found to be positively correlated with depression. This supports that among some Black MSM, high religiosity is associated with increased levels of depression and higher sexual risk behaviors. Given that depression has been correlated with lower immune function and higher mortality in prior research, Yi and colleagues (2006) examined specific dimensions of religiosity and spirituality related to depressive symptoms and HIV risk. Findings confirmed a negative relationship between spiritual well-being and depression. Having lower social support and lower spirituality were significantly correlated
with higher depressive symptoms, supporting links between depression, religiosity, spirituality, and HIV risk.

Given these findings from the current literature, an appropriate next direction for future research is examining the relationship of religiosity, spirituality, and high sexual risk behavior among Black men who have sex with men (BLACK MSM).
Conceptual Framework Relating HIV Risk, Substance Abuse, Depression, Spirituality and Religiosity

The conceptual model (Figure 1) guiding the proposed study was developed by research that highlights that few HIV and other STD prevention programs have looked at knowledge, attitudes, beliefs, and behaviors specific to Black sexuality and sexual orientation, particularly among Black MSM. Because of the strong association of Blacks with Black religious communities (Pew 2008; Yip, 2002), their attitudes regarding sexual norms are likely influenced by those promulgated and supported by those religious community (Pew, 2008; Pitt, 2010; Stokes & Peterson, 1998; Yip, 2002). Due to the negative attitudes of Black churches regarding sex in general, and homosexuality in particular, many Black MSM report that they find themselves in conflict with and rejected by organized religious communities (Fullilove, 2006; Miller, 2007; Wilson and Miller, 2002; Woodyard, Peterson, & Stokes, 2000).

The stigma associated with homosexuality may inhibit some men from identifying themselves as gay or bisexual, even though they have sex with other men (Stokes & Peterson, 1998). Some men who have sex with men and also with women (MSM/W) don't identify themselves as gay or bisexual (Stokes & Peterson, 1998; Woodyard, Peterson, & Stokes, 2000). Black MSM in this category may be less likely to be long-term monogamously partnered, less likely to arrive at high risk locations with prevention supplies, and/or less likely to consistently engage in safer sexual practices, such as condom use (Millet, et. al., 2006; Murray, et. al., 2007). All of these risk behaviors are associated with increased risk of HIV disease.

Homonegative cultural norms also may lead to decreased knowledge of HIV status, increased exposure to other STDs, and higher rates of HIV risk behavior (Ross, et. al., 2008). Research and surveillance among Black men has shown elevated rates of STDs and undetected
or late diagnosis of HIV infection, compared to other populations (Jeffries, et. al., 2008; Millet, et. al., 2006; Murray, et. al., 2007); both of these health disparities may contribute to higher rates of HIV infection among Black MSM. Higher rates of STDs are proxy measures for HIV risk behavior engagement and also independently may increase risk of HIV transmission (Beatty, et. al., 2004; CDC, 2009; Lieb, 2010). Late diagnosis of HIV is important because individuals in the later stages of HIV infection tend to have higher viral loads, which are associated with increased risk of HIV transmission (Kitahata, et. al., 2009; Millet, et al, 2006). Thus, Black MSM who do not know their HIV status may engage in higher risk behavior than Black MSM who are aware of their HIV status (Millet & Peterson, 2007; Jeffries, et. al, 2008).

Homonegative societal messages that appear as “norms” can influence negative attitudes, and beliefs among Black MSM that contribute to high-risk sexual behaviors. For example, studies by Miller (2005, 2007), Davis (2003), and Fullilove (2006) found that many of the attitudes, beliefs, and sexual behaviors of Black MSM are related to negative religious norms promulgated by largely Black religious congregations to which many Black MSM belong. As a result of these messages, many Black MSM may perceive their religious beliefs as at odds with their sexual orientation, thus causing inner conflict or dissonance (Miller, 2007). Results of multiple surveys indicate that these negative attitudes are perceived by Black MSM and that they are widely held by many Blacks in the United States (e.g., Glick & Golden, 2010; Pew, 2008, Pitt, 2010). These community norms, such as negative messages from largely Black religious institutions, have caused some Black MSM to terminate their religious affiliation and withdraw from that social support community to high risk social settings (bars, clubs, etc.) (Miller, 2007; Millet and Peterson, 2007; Millet, et al., 2006). It is possible that Black MSM internalize the homonegative (judgmental) messages often present in their religious and larger community contexts, giving rise
to dissonant self-perceptions. Past research suggests that such dissonance magnifies stress and diminishes coping skills (Miller, 2005; Miller, 2007; Pargament, et. al., 2004). This suggestion is consistent with the finding that these homonegative religious attitudes and messages are negatively correlated with positive health outcomes (Jeffries, et. al., 2008) and have been shown in some studies to be associated with high risk sexual behaviors (Fullilove, 2006; Miller, 2007; Millet, et al., 2009).

A few studies (e.g., Rodriquez, 2010; Rodriquez & Ouellette, 2010) found that Black MSM could deal with cognitive dissonance by methods which included: 1) rejecting the religious identity and divorcing oneself from the Christian religion; 2) rejecting homosexual identity, e.g., the individual seeks to become heterosexual through conversion therapy, 3) compartmentalization, e.g., the individual keeps both identities separate to achieve identity consonance, and 4) identity integration, e.g. the individual resolves threats to new identity and seeks to reconcile new identity as a new sexual-spiritual self. Some research suggests that religiosity is associated with cognitive dissonance among many Black MSM (Jeffries, et. al., 2008; Kegeles, et. al., 2009) and can be associated with higher rates of high sexual risk behavior, substance use, and depression (Mahaffy, 1996; Martin & Knox, 1997; Miller, 2007; Millet and Peterson, 2007; Millet, et. al., 2006. Figure 1 postulates that, although religiosity and spirituality have been treated as highly overlapping constructs, it may be more appropriate among Black MSM to define and operationalize them as separate and distinct constructs. This is the case because, in this population, spirituality may serve to diminish or eliminate cognitive distress among Black MSM and leads to Black MSM developing new attitudes and beliefs that decrease high sexual risk behavior, substance use, and depression (Aronson, 2007; Hardy & Raffaelli,
and leads to higher self-esteem and self-efficacy among Black MSM (Mahaffy, 1996; Martin & Knox, 1997; Miller, 2007; Millet, 2009; Noar et al., 2009; Stokes & Peterson, 1999).

Research involving depression and high risk behaviors among Black MSM

Several studies (Reisner, et al., 2009; Cochran and Mays, 2000; Meyer, et al., 2008) show the higher rates of depression among MSM over the general adult male population with rates of 15 to 26% for MSM compared to 5-12% for the general adult male population. Some research however, reported no association between depression and high risk behavior among MSM (Bradley, et al., 2008, Dilley, 1998).

Alvy (2010), Klobin (2006), and Stall (2003) report positive associations with depression and high risk behavior among MSM. Those studies that did report an association did find this positive relationship in both HIV-infected and HIV-uninfected individuals who participated in the research studies (Klobin et al., 2006; Parsons, 2003; Reisner et al., 2009; Stall et al., 2003).

Research has shown depression rates among Black MSM to be more prominent than in other populations. Rates of depression among Black MSM were reported as high as 33% (Reisner et al., 2009) when compared to heterosexual Black men and other MSM populations (Cochran and Mays, 1994; Peterson et al., 1996). Higher rates of depression have been positively associated with higher levels of sexual risk behavior among Black MSM (Alvy, 2010; Crawford, 2002; Perdue, 2003; Stall, 2003); and Myers et al. (2003) found depression to be a predictor of high risk behavior among a subsample of Black MSM and Black MSM/W. In addition, Reisner et al. (2009) reported that Black MSM who reported unprotected anal sex
were nine times as likely to be depressed and those diagnosed with an STI were six times as likely to be depressed.

Research examining the relationship between religion, spirituality, and depression found protective associations between these constructs, although these studies did not examine these relationships among Black MSM in particular. Rasic, et. al, (2010), found religiosity was associated with lower odds of depression and higher rates of religious attendance was associated with lower rates of depression (protective) among a sample of 1,615 adolescents. Similarly, Cotton, et. al., (2005), that among 134 adolescents that higher levels of spirituality was associated with fewer depressive symptoms and so an inverse relationship between depression and spirituality was found.

*Research involving substance use and high risk behaviors among Black MSM*

Research found a positive association between substance use and high risk behavior among MSM regardless of HIV serostatus (Boone, et. al., 2012; Bruce, et. al., 2012; Klobin, et al., 2003; VanDevanter, et. al., 2011). Studies found methamphetamine, cocaine, and alcohol use being the primary substances most associated with high risk behavior among MSM (Bruce, et. al., 2012; Colfax, et. al., 2003; Garafolo, et. al., 1998; Mustanski, 2007). In a recent literature review analyzing event level substance use immediately before or during an sexual encounter among MSM, Vosburg, et. al, (2012), found methamphetamine use and binge alcohol use to be most likely associated with unprotected sexual behavior.

Studies also examined the relationship between religiosity, spirituality, and substance use although not among Black MSM. Findings showed a negative relationship between religiosity, spirituality, and substance abuse (Piko, et. al., 2012). In a study among college students those
with highest average scores of spirituality and religiosity reported the lowest level of substance use (Dennis, et. al., 2009). Similarly Piko and Fitzpatrick, (2004), found religion to be protective in regards to alcohol use among adolescent participants confirming the association between substance use, religiosity, spirituality, and risk behavior.

**Summary**

STI incidence rates continue to increase among Black MSM more than other populations. Given the high incidence and higher sexual risks for Black MSM there appears other social and cultural factors that account for this continued increase among Black MSM. The literature supports a relationship between religiosity, spirituality, and high risk behavior among populations. Some research has suggested that religiosity and spirituality among Black MSM may be correlated but are multifaceted constructs. Conclusions suggest that among Black MSM these constructs account for certain levels of cognitive dissonance among Black MSM addressing their sexual and religious identity and can lead to negative coping behaviors and negative health outcomes (e.g., higher sexual risk, higher substance abuse, and higher levels of depression) among Black MSM. Findings also suggest positive spiritual and religious experiences may reduce the level of dissonance experienced by some Black MSM and may lead to positive health outcomes. Despite the unique role of religiosity and spirituality among Black MSM, research has not examined the relationships of these constructs and high sexual risk behavior among Black MSM. Because, future effective HIV prevention interventions intended for Black MSM may well include dissonance reduction, as well as, spirituality and religiosity components to achieve risk reduction, this study proposes examining the role of religiosity, spirituality, and high sexual risk behavior among Black MSM in an effort to better understand
the associations in order to design, develop, and implement behavioral interventions that may well decrease the continued HIV incidence among Black MSM.
METHOD

Quantitative Data analysis using the Brothers and Hermanos Study (ByHS) data set

Selection of the data set

The MSM population tends to experience significant stigma related to homophobia and other factors (Fullilove, 2006; Miller, 2007; Millet, et al, 2009). As a result, The Black MSM population in general is relatively hidden and difficult to access in numbers sufficient to support many research questions (Martin & Knox, 1997; Noar et, al, 2009; Stokes & Peterson, 1999), and the health and prevention needs of this population are under-researched. This suggests the need to maximize national level, multi-site studies that have been able to target sufficient resources to recruitment and retention of individuals within this challenging research area. In the proposed study, the Brothers y Hermanos Study (ByHS) database has been selected for use.

Several factors make the ByHS an appropriate choice to address the specific aims of this project. First, the ByHS study was rigorously designed and assessed a broad range of relevant areas. ByHS used an Audio Computer Assisted Self-interview (ACASI) that allowed private responding to solicit that most unbiased responses on sensitive questions (e.g., HIV risk, UAI, substance abuse). Second, the ByHS data set provides a very large sample (N = 1,140) of Black MSM recruited from large urban areas. This sample will provide adequate statistical power to examine the specific aims. Third, the ByHS data set provides comprehensive data on HIV risk behaviors, HIV testing, and perceptions of HIV risk. The level of risk data obtained in this federally funded study exceeds that possible in most primary data collection by unfunded researchers. Fourth, the ByHS data set contains excellent quality data, with few missing data.
Fifth, the ByHS data set assesses many of the covariates of HIV risk identified in the literature (e.g., comprehensive substance use assessment, depression/, social support). Sixth, the ByHS data set includes questions on both religiosity and spirituality that remain unutilized. Use of these data for secondary analysis of religiosity and spirituality would be a good use of this large resource to address unanswered questions about HIV risk in the target population.

Limitations of the data set

Use of an existing data set typically also results in limitations. First, the ByHS data set includes seven specific religiosity/spirituality variables (i.e., 4 religiosity, 3 spirituality). This limits, to some extent, the depth with which these domains can be examined. However, at this time, there are few studies of religiosity/spirituality in relation to HIV risk in Black MSM in the literature. The proposed study will provide an important initial assessment of these factors. Second, the religiosity/spirituality items available in the ByHS data set are not part of standardized scales. This limits comparisons of findings from this study to other studies that have relied on standardized measures. However, past research has not found clear cut, gold standard religiosity/spirituality scales, and none have been used with this population. In addition several studies that have conducted research on these issues have used stand-alone questions to assess religiosity and spirituality since no research standard exists to analyze these constructs (Coyle, 2002; Delany, 2005). Another of the limitations of the study is that recruitment sites in NYC and Philadelphia where Black MSM were recruited were in AIDS service organizations thus a significant percentage of participants were HIV-infected.

The ByHS religiosity items provide three items on religious behaviors specific to MSM and one item specific to religious attitudes about MSM sexuality within a religious community.
The spirituality items contain one general spirituality item, one item on use of spirituality as a coping measure for homophobia/discrimination, and one item related to spirituality and overall health. Overall, the specificity of the religiosity/spirituality questions to the issues faced by the target population makes these items worthwhile address the specific aims of the proposed study.

With the new knowledge obtained by the proposed study, culturally specific and appropriate prevention interventions that incorporate a religious and/or spirituality component can be developed to enhance existing prevention programs or serve as standalone models to decrease HIV-infection among Black MSM. Successful completion of the proposed study will provide a better understanding of whether religion and spirituality serve as protective or risk factors and how these measures are correlated with HIV risk behavior among Black MSM.

**Description of the data sample**

The proposed study will use data from the 2005 Brothers y Hermanos Survey (ByHS) conducted by the Centers for Disease Control and Prevention. ByHS is a representative sample of 2,235 Latino and Black MSM enrolled in the study. The sampling frame consisted of 1,081 Latino MSM (516 from New York City and 565 from Los Angeles County) and 1,141 Black MSM (601 from New York City and 540 from Philadelphia). The goal of the survey was to understand the differences in undiagnosed HIV infection among Latino and Black MSM. Respondents of this multi-site study completed a comprehensive behavioral questionnaire of demographic, contextual, and HIV risk factors and were tested for HIV. The prevalence of undiagnosed HIV infection among the participants was assessed and compared with men who were aware of their HIV sero-positive status. Four research teams conducted the study. Two teams recruited Latino MSM from the New York City and Los Angeles County areas from May 2005 through April 2006. Black MSM were recruited by the other two teams from the New York
City and Philadelphia, PA area from the same time period. Participants who were deemed eligible had to present identification as being born male and older than 18 years. In addition they had to report being sexually active either by admitting to oral and/or anal sex or mutual masturbation with another male within the past 12 months and living in the respective cities in which they were recruited. Recruitment was open to participants who were HIV-positive, HIV-negative, and unknown HIV status.

Respondent Driven Sampling (RDS), which is a peer-to-peer chain link to chain link type sampling, was used to recruit ByHS participants. Initial Peer Leaders called “seeds” were identified by the 4 teams in each of the respective cities and initiated the recruitment. Participants that were recruited by the seeds were then asked to recruit an additional set of participants using three $15 or $20 coupons for each additional eligible participant until 500 males were recruited by each of the four teams for a total of 2,235 due to oversampling in some cities among Black MSM.
Data collection sessions were held in project offices in the CBO office spaces where participants were screened for eligibility and written informed consent was obtained. Eligible participants completed an audio computer-assisted self-interview (ACASI) in English or Spanish that included the entire survey. Then participants who did not self-disclose a HIV-positive serostatus were provided HIV pretesting information and HIV testing using the 20-minute OraQuick HIV test utilizing oral fluid mouth swab. Those participants who tested preliminary positive were then tested via venipuncture and blood confirmation testing was used. These participants returned for confirmation results and post-test counseling. Participants who completed the ACASI and HIV testing received $50. This study will be using the 1,141 Black MSM (601 from New York City and 540 from Philadelphia) presented in the data set.

Description of the Sample of Participants

The mean, median, standard deviations as well as the minimum and maximum values for the continuous variables are indicated in Table 1. All variables were normally distributed. The number and frequency for the categorical values are listed in Table 2 below. Ninety-nine percent of the sample identify as non-Hispanic Black. Sixty-five percent identify as homosexual or gay. Forty-five percent were unemployed. Ninety percent of the participants identified as single/never been married. The average education level of the participants ranged from non-high school graduate to doctorate level with the average education level being a high school graduate/GED or equivalent. The average annual income of the participants was less than $10,000. In addition 10% of participants reported no health insurance, 65% reported having Medicaid, 15% reported Medicare, and 10% reported private health insurance. In addition, 49% of the participants reported to be in a relationship with a main partner/significant other.
<table>
<thead>
<tr>
<th>Table-1 Participant Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (years)</strong></td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
</tr>
<tr>
<td>Black Hispanic</td>
</tr>
<tr>
<td>Non-Hispanic</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
</tr>
<tr>
<td>Full time</td>
</tr>
<tr>
<td>Part time</td>
</tr>
<tr>
<td>Unemployed</td>
</tr>
<tr>
<td>Disabled</td>
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<tr>
<td><strong>Student Status</strong></td>
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<tr>
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<tr>
<td>Part time</td>
</tr>
<tr>
<td>None</td>
</tr>
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<td></td>
</tr>
</tbody>
</table>
Description of the independent and dependent measures (religiosity, spirituality, HIV risk)

Predictor Variables

Sexual Risk Variables. The ByHS utilized 113 questions to assess HIV risk behavior including questions on HIV testing, perceived HIV partner status, unprotected sexual behavior with males and females in the past 12 months and condom use and HIV testing to ascertain HIV-infection of participants. For this study sexual risk will be assessed using 1) condom use history in the last 3 months, 2) unprotected anal intercourse in the past 3 months (UAI)-both receptive and insertive, 3) sexual transmitted disease infection status, and 4) HIV infection status.

Table-2 Risk Variable Characteristics

<table>
<thead>
<tr>
<th>Condom Use History</th>
<th>N (%)</th>
<th>Alcohol Use</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing response</td>
<td>2(2)</td>
<td>Missing</td>
<td>3(1)</td>
</tr>
<tr>
<td>No</td>
<td>761(67)</td>
<td>No</td>
<td>394(34)</td>
</tr>
<tr>
<td>Yes</td>
<td>378(31)</td>
<td>Yes</td>
<td>744(65)</td>
</tr>
<tr>
<td>Receptive Anal Sex</td>
<td>N (%)</td>
<td>Binge Alcohol Use</td>
<td>N (%)</td>
</tr>
<tr>
<td>Missing</td>
<td>558(49)</td>
<td>Missing</td>
<td>397(35)</td>
</tr>
<tr>
<td>No</td>
<td>408(36)</td>
<td>None</td>
<td>137(12)</td>
</tr>
<tr>
<td>Yes</td>
<td>175(15)</td>
<td>Daily</td>
<td>60(5)</td>
</tr>
<tr>
<td>Insertive Anal Sex</td>
<td>N (%)</td>
<td>Weekly</td>
<td>285(25)</td>
</tr>
<tr>
<td>Missing</td>
<td>558(49)</td>
<td>Monthly</td>
<td>199(18)</td>
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<tr>
<td>No</td>
<td>297(26)</td>
<td>&lt; Monthly</td>
<td>63(5)</td>
</tr>
<tr>
<td>Yes</td>
<td>286(25)</td>
<td>1141</td>
<td>1141</td>
</tr>
<tr>
<td>STD Ever</td>
<td>N (%)</td>
<td>Methamphetamine Use</td>
<td>N (%)</td>
</tr>
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<td>378(33)</td>
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<td>763(67)</td>
<td>No</td>
<td>1102(96)</td>
</tr>
<tr>
<td>New Sero-Status</td>
<td>N (%)</td>
<td>Cocaine Use</td>
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<td>Missing</td>
<td>13(1)</td>
<td>Missing</td>
<td>3(1)</td>
</tr>
<tr>
<td>Non-infected/Negative</td>
<td>538(47)</td>
<td>No</td>
<td>769(67)</td>
</tr>
<tr>
<td>Infected/positive</td>
<td>590(52)</td>
<td>Yes</td>
<td>369(33)</td>
</tr>
<tr>
<td>Depression</td>
<td>N (%)</td>
<td>Crack Use</td>
<td>N (%)</td>
</tr>
<tr>
<td>Missing response</td>
<td>2(1)</td>
<td>Missing</td>
<td>2(1)</td>
</tr>
<tr>
<td>None</td>
<td>179(15)</td>
<td>No</td>
<td>757(66)</td>
</tr>
<tr>
<td></td>
<td>1 to 2 Days</td>
<td>3 to 6 Days</td>
<td>Other</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------</td>
<td>-------------</td>
<td>-------</td>
</tr>
<tr>
<td></td>
<td>387(34)</td>
<td>265(23)</td>
<td>308(27)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Binge Alcohol Use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>397(35)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cocaine Use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crack Use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marijuana Use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heroin Use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poppers Use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ecstasy Use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Outcome Variables

The outcome variables will be the following: religiosity, and spirituality. Measures for these variables religiosity (4-questions; SPI 1-4), and spirituality (3-questions; SPI 5-7) are presented with Likert scale responses as noted in Table 3 below:

Table-3 Outcome Variable Characteristics

<table>
<thead>
<tr>
<th>Worship (Dichotomous)</th>
<th>N (%)</th>
<th>Guidance from Higher Power</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing</td>
<td>5(1)</td>
<td>Missing</td>
<td>4(1)</td>
</tr>
<tr>
<td>Never</td>
<td>281(25)</td>
<td>No spiritual beliefs</td>
<td>57(5)</td>
</tr>
<tr>
<td>Some</td>
<td>855(74)</td>
<td>Strongly Agree</td>
<td>705(62)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agree Somewhat</td>
<td>270(24)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disagree Somewhat</td>
<td>48(3)</td>
</tr>
<tr>
<td>Missing</td>
<td>5(1)</td>
<td>Strongly Disagree</td>
<td>57(5)</td>
</tr>
<tr>
<td>Never</td>
<td>281(25)</td>
<td>Spiritual</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Connection</td>
<td></td>
</tr>
<tr>
<td>Some</td>
<td>254(22)</td>
<td>Missing</td>
<td>66(5)</td>
</tr>
<tr>
<td>Monthly</td>
<td>350(30)</td>
<td>No spiritual beliefs</td>
<td>15(1)</td>
</tr>
<tr>
<td>Weekly</td>
<td>251(22)</td>
<td>Strongly Agree</td>
<td>618(56)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agree Somewhat</td>
<td>289(26)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disagree Somewhat</td>
<td>84(7)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Strongly Disagree</td>
<td>69(5)</td>
</tr>
<tr>
<td>Open About Sexuality</td>
<td></td>
<td>Spirituality and health</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>10(1)</td>
<td>Missing</td>
<td>8(1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No spiritual beliefs</td>
<td>59(5)</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>144(13)</td>
<td>No spiritual beliefs</td>
<td>15(1)</td>
</tr>
<tr>
<td>Agree Somewhat</td>
<td>157(14)</td>
<td>Strongly Agree</td>
<td>618(56)</td>
</tr>
<tr>
<td>Disagree Somewhat</td>
<td>124(1)</td>
<td>Agree Somewhat</td>
<td>289(26)</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>423(37)</td>
<td>Disagree Somewhat</td>
<td>84(7)</td>
</tr>
<tr>
<td>Don’t have one</td>
<td>283(25)</td>
<td>Strongly Disagree</td>
<td>69(5)</td>
</tr>
<tr>
<td>Open About Sexuality</td>
<td></td>
<td>Guidance from Higher Power</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>293(26)</td>
<td>No spiritual beliefs</td>
<td>57(5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Strongly Agree</td>
<td>716(63)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agree Somewhat</td>
<td>270(24)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disagree Somewhat</td>
<td>56(5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Strongly Disagree</td>
<td>32(2)</td>
</tr>
<tr>
<td>Religious beliefs and</td>
<td></td>
<td>Guidance from Higher Power</td>
<td></td>
</tr>
<tr>
<td>sex with men</td>
<td></td>
<td>Missing</td>
<td>4(1)</td>
</tr>
<tr>
<td>Missing</td>
<td>10(1)</td>
<td>No spiritual beliefs</td>
<td>57(5)</td>
</tr>
<tr>
<td>No religious beliefs</td>
<td>159(14)</td>
<td>Strongly Agree</td>
<td>705(62)</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>279(24)</td>
<td>Agree Somewhat</td>
<td>270(24)</td>
</tr>
<tr>
<td>Disagree Somewhat</td>
<td>233(20)</td>
<td>Disagree Somewhat</td>
<td>48(3)</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>291(26)</td>
<td>Strongly Disagree</td>
<td>57(5)</td>
</tr>
<tr>
<td>Choose religious beliefs versus sex with man</td>
<td>N (%)</td>
<td>Spiritual Connection</td>
<td>N (%)</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>-------</td>
<td>----------------------</td>
<td>-------</td>
</tr>
<tr>
<td>Missing</td>
<td>17(1)</td>
<td>Missing</td>
<td>66(5)</td>
</tr>
<tr>
<td>No religious beliefs</td>
<td>173(15)</td>
<td>No spiritual beliefs</td>
<td>15(1)</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>383(34)</td>
<td>Strongly Agree</td>
<td>618(56)</td>
</tr>
<tr>
<td>Agree Somewhat</td>
<td>185(16)</td>
<td>Agree Somewhat</td>
<td>289(26)</td>
</tr>
<tr>
<td>Disagree Somewhat</td>
<td>192(17)</td>
<td>Disagree Somewhat</td>
<td>84(7)</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>191(17)</td>
<td>1141</td>
<td>69(5)</td>
</tr>
</tbody>
</table>
In an effort to better analyze the religiosity variable, a new variable “Religiosity” was created as a sum of the Likert scale responses: Sum of the Worship + Openness + Religious Beliefs + Choosing Religious Beliefs. This variable is a composite sum of the responses to the four original ByHS religiosity questions.

As noted in the table below, the questions and various possible scenarios are given to better highlight the different ways an individual could reach a particular score (N) noted above.

<table>
<thead>
<tr>
<th>Question Header</th>
<th>Question</th>
<th>Response Score (9)</th>
<th>Response Score (9)</th>
<th>Response Score (8)</th>
<th>Response Score (8)</th>
<th>Response Score (16)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worship</td>
<td>How often have you attended a place of worship (e.g., church, temple, mosque) during the past 6 months other than for a wedding or funeral?</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Continuous</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open about sexuality</td>
<td>I am able to be open about my sexuality in my religious community.</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Religious beliefs</td>
<td>My religious beliefs make me feel bad about having sex with other men.</td>
<td>3</td>
<td>2</td>
<td>Missing</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>sex with men</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Choose religious beliefs</td>
<td>I often have to choose my religious beliefs over my desire to be with a man.</td>
<td>3</td>
<td>2</td>
<td>Missing</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>versus sex with man</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Same Responses</td>
<td></td>
<td>3</td>
<td>10</td>
<td>2</td>
<td>9</td>
<td>30</td>
</tr>
</tbody>
</table>
In an effort to better analyze the spirituality variable, a new variable “SPIRITUALITY” was created as a sum of the continuous variables: Guidance + Spiritual Connection + Spirituality and Health. This variable is a composite sum of the responses to the three original ByHS spirituality questions.

As noted in the table below, the questions and various possible scenarios are given to better highlight the different ways an individual could reach a particular score (N) noted above.

<table>
<thead>
<tr>
<th>Question Header</th>
<th>Question</th>
<th>Response Score (9)</th>
<th>Response Score (9)</th>
<th>Response Score (9)</th>
<th>Response Score (11)</th>
<th>Response Score (11)</th>
<th>Response Score (12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guidance from Higher Power</td>
<td>I always seek guidance from a higher power in times of need.</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Spiritual Connection</td>
<td>My spiritual connection with a higher power helps me cope with negative beliefs that other people have about homosexuality.</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Spirituality and health</td>
<td>My spiritual beliefs encourage me to do everything I can to stay healthy.</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Total Number of Same Responses</td>
<td></td>
<td>13</td>
<td>123</td>
<td>10</td>
<td>42</td>
<td>60</td>
<td>493</td>
</tr>
</tbody>
</table>
Preliminary Data Analysis Plan

All analyses were conducted in JMP version 10 and SAS System for Windows®, Version 9.1.3. Demographic variables such as race/ethnicity, place of residence, educational attainment, income, employment status, partner/marital status (Table 1), will be compared with predictor and outcome variables. Continuous as well as dichotomized variables will be used in the analysis.

Three Research Questions are proposed:

Research question #1: What is the relationship of religiosity and spirituality in Black MSM? This paper will be a univariate analysis of the religiosity and spirituality variables and the other variables described above presenting them and their correlations to describe religiosity and spirituality among Black MSM. A correlation matrix will be used to describe the relationship between these variables to describe the relationship between these variables and to ascertain if there is a significant relationship between the variables.

Research question #2: What is the relationship of religiosity, spirituality, and high risk behavior in Black MSM? HIV risk will be analyzed using the recoded variables for condom use, HIV infection, STD infection, and recent unprotected anal intercourse (UAI) behavior described above in Table-2. A series of stepwise, multiple logistic models will be run to ascertain the significant relationship of these variables.

Research question #3: What is the relationship of religiosity, spirituality, substance abuse and depression in Black MSM? Substance abuse and depression will be categorized as presented above and a series of logistic regression models will be used to analyze the relationship between there variables.
Works Cited


What is the association of religiosity, spirituality, high risk behavior among Black MSM?
Religiosity, Spirituality and Risk among Black Men Who Have Sex with Men (MSM): An exploratory study

Proposed Coauthors:

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Stacey S Cofield, PhD¹
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Keywords: Black men who have sex with men (Black MSM), HIV risk, religiosity, spirituality

Pages: 29
Tables: 6
Figures: 2
Word Count: 2,788
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Abstract

Blacks in the United States, including Black Men Who Have Sex with Men (MSM), tend to have stronger religious and spiritual affiliations compared with other racial/ethnic populations. HIV and STD incidence rates continue to rise among Black MSM. Using data from the CDC Brothers y Hermanos (ByHS) project, this study examined correlations between religiosity, spirituality, age, high risk behavior e.g., substance use, and high risk sexual behavior (e.g., condom use history, unprotected sexual intercourse, HIV-infection status, and STD infection status) among Black MSM (N=1141). This exploratory study examined whether religiosity and spirituality were associated with high risk behavior, and high risk sexual behavior among Black MSM.

Religiosity and spirituality indices were compiled from the ByHS data. This index was significantly associated with HIV-infection and use of cocaine, crack, and poppers as well as marginally associated with ecstasy use. Spirituality was significantly associated with HIV-infection status, STD-infection status, alcohol use, and crack use.

Given these relationships, current and future HIV prevention models targeting Black MSM should consider the potential importance of the roles of religiosity and spirituality in the lives of Black MSM to increase the efficacy of risk reduction interventions.
Introduction

Blacks in the United States typically have strong associations with religion and religious institutions. A recent national survey of religious behaviors and beliefs found that, relative to other racial and ethnic groups, Blacks are more likely to report a formal religious affiliation (Glick & Golden, 2010; Pew, 2003, 2008; Pitt, 2010). A high majority (85%) of Blacks reported that religion is very important to them, and 60% of Black individuals surveyed reported weekly or “regular” church attendance (Pew, 2003; Pew, 2008). Among the Black individuals surveyed in a nationwide probability sample who reported no formal religious affiliation, 60% indicated that religion was somewhat or very important in their lives (Pew, 2008). Comparatively, 56% of the general population reported that religion was very important to them, and 39% reported weekly or regular church attendance (Pew, 2003; Pew, 2008).

In addition to religious differences among racial groups, persistent differences concerning the acceptance of homosexuality appear to exist among different racial communities. Blacks tend to report more negative attitudes regarding homosexuality than Whites and other racial/ethnic groups (Glick & Golden, 2010; Pitt, 2010). In a recent survey, 85% of Blacks endorsed homosexuality as sinful and reported generally unfavorable views regarding homosexual males (Pew 2008). Similarly, Glick and Golden (2010) found that 72.3% of Blacks surveyed endorsed homosexuality as “always wrong,” compared to 51.8% of Whites. The study also found that this attitude toward homosexuality among Blacks was largely unchanged since the 1970’s, but among White respondents’ negative perceptions of homosexuality declined from 70.8% to 51.8%. As described below, these attitudes concerning religion and homosexuality and higher levels of homophobia experienced by Black MSM versus other MSM may be a
contributing factor to increased incidence of HIV/AIDS risk behaviors and support the need for continuing research (Glick & Golden, 2010; Jeffries, et. al, 2012; Pitt, 2010).

**Cognitive Dissonance and Sexual Risk among Black MSM**

The strong association of many Blacks with predominately Black religious institutions likely influences their attitudes regarding sexual norms (Pew, 2008; Pitt, 2010; Stokes & Peterson, 1998; Yip, 2002). Due to the negative attitudes of many Black churches regarding sex in general, and homosexuality in particular (Miller, 2007; Wilson and Miller, 2002), many Black MSM report finding themselves in conflict with and rejected by organized religious communities (Fullilove, 2006; Miller, 2007; Ross, et., al., 2008; Wilson and Miller, 2002; Woodyard, Peterson, & Stokes, 2000). Such conflicts and incongruities between key life areas can lead to a disconnection between religious identity and homosexual behavior. It is possible that Black MSM internalize the homonegative (judgmental) messages often present in their religious and larger community contexts, giving rise to dissonant self-perceptions that foster HIV-related risk (Glick & Golden, 2010; Wilson and Miller, 2002; Woodyard, Peterson, & Stokes, 2000).

Due to stigma some black MSM in may be less likely to be long-term monogamously partnered, less likely to arrive at high-risk locations with prevention supplies, and/or less likely to engage in safer sex practices, such as condom use (Millet, et. al., 2006; Murray, et. al., 2007). All of these risk behaviors are associated with increased risk of STIs, which are proxy measures for HIV risk behavior engagement and also independently may increase risk of HIV transmission (Beatty, et. al., 2004; CDC, 2009).

Several studies also have found that the internalized barriers of stigma, shame, low self-esteem and homophobia create an atmosphere of silence around MSM sexual behaviors and decrease the probability of Black MSM discussing high-risk sexual behaviors. This culture of
silence can lessen the impact of HIV prevention education interventions (Jeffries, et. al., 2012; Martin & Knox, 1997; Malebranche, 2003). Some studies also have suggested that the internalization of religiously influenced homonegative messages contributes to lower self-efficacy regarding preventive sexual practices among this population (Martin & Knox, 1997; Noar et, al, 2009; Stokes & Peterson, 1998). Thus, it is important to examine the association between religiosity and spirituality and high risk sexual behavior among Black MSM.

Religiosity and spirituality among Black MSM

Although religion and spirituality as concepts often overlap and much research has found significant associations between the two (Horn, et., al., 2005; Ironson, et., al., 2006), “religion” typically refers to the formal set of beliefs and practices affiliated with an acknowledged religious authority and includes such overt visible acts as praying before meals, attending worship services, and reading sacred texts (Davis, et al, 2003; Coyle, 2002). “Spirituality” typically denotes a personal experience or feeling of connectedness with a higher being and typifies intrinsic unseen qualities appropriated to ones relationship with an otherness, higher power, or God. Spirituality can also include the search or path for transcendent meaning (Davis, et al, 2003; Coyle, 2002; Miller, 2007).

Despite the unique role of religiosity and spirituality among Black MSM, research has not examined the relationships between these constructs and risk behaviors. The present study was exploratory in nature and was aimed at increasing understanding of population views and needs to enhance HIV prevention and intervention programs targeting Black MSM.
Methods

Description of the data sample

The present study used a sub-set of data from the 2005 Brothers y Hermanos Study (ByHS) conducted by the Centers for Disease Control and Prevention (CDC). ByHS collected a sample of 1,141 Black MSM (601 from New York City and 540 from Philadelphia). Eligible ByHS participants were born male, were over age 18, and were sexually active with another male within the past 12 months (i.e., oral or anal sex, mutual masturbation with another male). Recruitment was open to participants who were HIV-positive, HIV-negative, and unknown HIV status (Marks, et. al, 2009).

Selection of the data set

The overall goal of the original ByHS study was to understand differences in undiagnosed HIV infection among Black MSM. The ByHS data set was selected for use in the present study as it is, to our knowledge, the only large data set (N = 1,154) of Black MSM respondents that assessed both religion and spirituality, as well as comprehensively assessing HIV status, risk behaviors, and associated variables.

ByHS participants were recruited using Respondent Driven Sampling (RDS) (Heckathorn, 1997), which is a variant of peer-to-peer chain driven sampling method. Participants who did not self-disclose as HIV-positive at intake were provided HIV counseling and testing (OraQuick oral swab); individuals testing preliminary positive for HIV infection received venipuncture blood confirmation testing and returned for results and post-test counseling. Participants were compensated $50 for completion of study procedures.
Description of the Sample of Participants

Table 1 shows the demographic characteristics of ByHS participants included in the present study. A majority of the sample identified as non-Hispanic Black, and single/never married; over half identified as homosexual or gay. Nearly half were unemployed, and educational attainment ranged from non-high school graduate to doctoral level (mean educational level was high school graduate/GED). Average participant age was 41.5 years (Range 18 to 71, SD=9.63).

Measures (religiosity, spirituality, HIV risk)

Dependent Variables

The dependent variables were religiosity, and spirituality. Measures for these variables religiosity (4-questions), and spirituality (3-questions) are presented with scale responses as noted in Table 1.2.

Outcome Variables

This exploratory study examined relationships among sexual risk (unprotected sex, HIV-infection, STD infection) and other high risk behavior variables (substance use) and religiosity and spirituality.
A religiosity index was created (Hsueh-Sheng Wu, 2012) by summing the scale responses of the four religiosity questions from the ByHS data: Worship (0-4) + Openness (0-4) + Religious Beliefs (0-4) + Choosing Religious Beliefs (0-4) to develop a composite sum of the responses to the four original ByHS religiosity questions. Figure 1.1 shows the total number of responses for each number and its corresponding percentages.

Insert Figure 1.1 Here

Similarly, a spirituality index was created by using participant responses to three questions by summing guidance (0-4) + spiritual connection (0-4) + spirituality and health (0-4). Spirituality responses are noted in Figure 1.2

Insert Figure 1.2 Here

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Analysis

Procedures to Identify Correlations of religiosity and spirituality

To examine which risk and demographic variables were significantly correlated with both religiosity and spirituality, a correlation matrix demographic and risk variables (i.e., unprotected anal intercourse [UAI], both receptive and insertive, condom use history, HIV-infection status, and STD infection status) was created and Pearson correlations were examined along with the corresponding p-values and reported in Table 1.4.

A series of ANOVAs were conducted to examine the relationship between age and religiosity as well as age and spirituality. Both religiosity ($F[1, 1134]=18.20, p<0.0001$) and spirituality ($F[1, 1134]=4.50, p=0.0342$) were significantly positively associated with age.

To further analyze the risk variables associated with religiosity and spirituality, the Chi-square ($\chi^2$) and corresponding p-value for each statistically significant risk variable were computed and are reported in table 1.5 and table 1.6. These tables include the individual religiosity and spirituality index sub-questions as well and the corresponding p-values.
Results

The correlation between religiosity and spirituality was 0.1634 (p <0.0001), however, these were significantly associated with different risk variables indicating they are distinct constructs.

Religiosity: Religiosity was significantly associated with age (r =0.1331, p<0.0001), cocaine use (r = 0.0978, p=0.0010), and crack use (r= 0.1128, p=0.0001), and significantly negatively associated with ecstasy use (r=-0.0617, p=0.0375), poppers use (r= -0.0698, p=0.0185), and HIV-infection status (r= -0.1352, p=<0.0001). The religiosity index was positively, but non-significantly, associated with non-prescription substance use. Non-significant negative associations were found between the religiosity index and both unprotected receptive and insertive anal intercourse.

Chi-square analysis of the religiosity index and various risk variables found that the religiosity index was significantly associated with HIV-infection $\chi^2 [(1123, N=1125)=17.51, p=<0.0001]$, cocaine use $\chi^2 [(1135, N=1137)=10.29, p=0.0013]$, crack use $\chi^2 (1135, N=1137)=14.60, p=<0.0001]$ and poppers use $\chi^2 [(1135, N=1137)=4.52, p=0.0330]$ and marginally associated with ecstasy use $\chi^2 [(1135, N=1137)=3.38, p=0.0661]$.

Spirituality: The spirituality index was positively associated with STD-infection status (r=0.0829, p=0.0051), and HIV-infection status (r=0.1900, p=<0.0001), and negatively associated with receptive anal intercourse (r= -0.0835, p=0.0443), unprotected anal intercourse (r= -0.0684, p=0.0212), alcohol use (r= -0.1245, p=0.0001), cocaine use (r= -0.0719, p=0.0153), and crack use (r= -0.1164, p=<0.0001). Chi square analysis found significant associations between the spirituality index and HIV-infection status $\chi^2 [(1123, N=1125)=36.98, p=<0.0001]$,
STD-infection status $\chi^2 [(1136, N=1138)=10.73, p=<0.0001]$, alcohol use $\chi^2 [(1135, N=1137)=30.11, p=0.0093]$, and crack use $\chi^2 [(1135, N=1137)=4.73, p=0.0296]$. 
Discussion

Religiosity and spirituality were significantly associated with various high risk behaviors among Black MSM. Although religiosity and spirituality were strongly associated, their pattern of relationships with other variables was different, suggesting that the two are related, but distinct, constructs.

More religious Black MSM tended to report cocaine and crack use, were more likely to be HIV-negative, and to participate less in unprotected receptive anal intercourse. This pattern of results suggests a complex relationship between risk and protective factors and HIV-infection in this sample. As found in other studies, Rasic (2010), and Cotton, et. al. (2005), religiosity was significantly negatively associated with certain substance use, such as poppers and ecstasy, and may promote less use of these substances among Black MSM. Religiosity among Black MSM who use crack and cocaine was associated with higher levels of risky behavior as found in other studies, may increase risk of HIV and STD infection (Klobin, et., al., 2006; Parsons, et. al., 2012; Reisner, et., al., 2009; Stall, et. al, 2003). These men may have higher levels of dissonance, which in keeping with our theory may account for the high risk behavior.

Similarly, in other studies (Davis, 2003, Hampton, et. al., 2010), MSM who reported a higher degree of spirituality also tended to be HIV-infected and in this study they also tended to report ever having an STD. Given a lack of ability to denote a temporal association in this study, Black MSM’s level of spirituality could have increased upon HIV or STD infection occurred explaining the positive association between spirituality and these constructs.

Spirituality was negatively associated with unprotected anal sex, receptive anal intercourse, alcohol use, cocaine use, and crack use. As in other research (Murray, et., al., 2007; Wutoh, et. al., 2011), which found that increased levels of spirituality corresponded to decreased levels of certain risky behaviors, this study found among Black MSM, spirituality might be
protective of unprotected insertive anal intercourse, unprotected casual sex, and non-prescription substance use. One possible inference is that these men may have achieved a level of cognitive consonance, accounting for these differences in behavior.

HIV infection status or STD infection status is not a risk behavior; however, Black MSM who were infected did participate in high risk behaviors including having unprotected sex with a partner whose HIV infection status was unknown.

Given that religiosity may discourage the use of poppers, and ecstasy, and spirituality might discourage the practice of unprotected receptive anal intercourse, unprotected anal intercourse; and the use of alcohol, crack, and cocaine, current and future HIV prevention models targeting Black MSM might incorporate religiosity and spirituality to increase the efficacy of high risk reduction outcome measures.

**Limitations**

First, the use of a cross-sectional study design introduces the possibility of measured and unmeasured confounding factors and causality cannot be inferred from the associations presented in this study. Second, the ByHS survey relied on participant self-report of risk behaviors, which may not accurately reflect the true risk behaviors, although collected by confidential computer-assisted methods. Third, although cognitive dissonance and consonance and their relationships with religiosity and spirituality, formed the theoretical framework of the study, the data set did not allow direct measurement of consonance or dissonance. Fourth, while religiosity and spirituality among HIV-infected individuals is reported, the cross-sectional data set does not allow assumptions regarding whether these levels changed with HIV-infection status. Better understanding temporal relationships between HIV-infection status and religiosity and spirituality is an important avenue for future research. Finally, the religiosity/spirituality items
available in the ByHS data set are not part of standardized scales. This limits comparisons of findings from this study to other studies that have relied on standardized religiosity/spirituality measures. However, past research has not identified gold standard religiosity/spirituality scales (Johnstone, et al., 2009), and no standardized measures have been used with Black MSM.

Summary

This exploratory study found that religiosity and spirituality are constructs important and significantly associated with certain high risk behaviors among Black MSM. This paper illustrates which variables are significantly associated with these constructs. Given the relationships between religiosity and spirituality and certain high risk behaviors among Black MSM, future risk reduction interventions may achieve increased efficacy by incorporating these constructs in the design, development, and implementation of behavioral models for Black MSM. The relationships identified in this paper, support the value of further study of the potential roles of the religiosity and spirituality constructs in risk behaviors among Black MSM. Such developmental work is necessary for incorporation into tailored risk reduction programs for this underserved, high-risk population.
**Future Implications**

Given that HIV infection rates continue to increase among Black MSM and that other social and cultural factors account for the new incidence among this population, this study used a theoretical framework of cognitive dissonance theory to guide the direction of the research, and found religiosity and spirituality to be significantly associated with high-risk behaviors among Black MSM. Religiosity may be associated with more dissonance among Black MSM and may promote more crack and cocaine use, and spirituality may be associated with cognitive consonance and may decrease the practice of unprotected anal intercourse and use of alcohol, crack, and cocaine among Black MSM. Future studies and health behavior theories should consider incorporating these constructs in the design and testing of risk reduction interventions for this population.
References


progression over 4 years in people with HIV. *Journal of General Internal Medicine.* Vol. 21 Suppl 5, pp. S62-68.


TABLES AND FIGURES
Table 1.1  Participant characteristics of black men who have sex with men, Brothers y Hermanos Study, 2005–2006

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Table 1.2 Independent variable characteristics presented with variable name, number and corresponding percent of black men who have sex with men, Brothers y Hermanos Study, 2005–2006

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Please refer to Figure 1.2 and Figure 1.4. Religiosity questions were four: 1) worship, 2) openness about sexuality, 3) religious beliefs, and 4) choosing religious beliefs vs. sex with men. The spirituality questions were three: 1) guidance, 2) spiritual connection, and 3) spirituality and health.
Table 1.3 Risk variable characteristics of black men who have sex with men, Brothers y Hermanos Study, 2005–2006

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Table 1.4. Correlations with Religiosity and Spirituality Indices

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<th>95 % Confidence Interval</th>
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<td>-0.0008</td>
<td>(-0.082, 0.081)</td>
<td>-0.0578</td>
<td>(-0.139, 0.024)</td>
</tr>
<tr>
<td>Unprotected Receptive Anal Intercourse</td>
<td>-0.0324</td>
<td>(-0.114, 0.049)</td>
<td>0.0433</td>
<td>(-0.038, 0.124)</td>
</tr>
<tr>
<td>Unprotected Casual Sex</td>
<td>0.0226</td>
<td>(-0.036, 0.081)</td>
<td>-0.0181</td>
<td>(-0.076, 0.040)</td>
</tr>
<tr>
<td>Non-prescription Substance Use</td>
<td>0.0372</td>
<td>(-0.021, 0.095)</td>
<td>-0.0487</td>
<td>(-0.107, 0.010)</td>
</tr>
</tbody>
</table>

1 – Higher values indicate stronger relationship between variables.
2 – Negative values indicate reciprocal or inverse relationships between variables.
Table 1.5. Chi-square and p-values of religiosity associated with risk variables

<table>
<thead>
<tr>
<th>Religiosity Questions</th>
<th>Question</th>
<th>Risk Variables (df, N %, p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>HIV- infection</td>
</tr>
<tr>
<td>Worship</td>
<td>How often have you attended a place of worship (e.g., church, temple, mosque) during the past 6 months other than for a wedding or funeral?</td>
<td>1121, 1123</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.0066</td>
</tr>
<tr>
<td>Open about sexuality</td>
<td>I am able to be open about my sexuality in my religious community.</td>
<td>838, 840</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Religious beliefs and sex with men</td>
<td>My religious beliefs make me feel bad about having sex with other men.</td>
<td>838, 840</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Choose religious beliefs versus sex with man</td>
<td>I often have to choose my religious beliefs over my desire to be with a man.</td>
<td>838, 840</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Total Religiosity Index</td>
<td></td>
<td>1123, 1125</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

1-Bolded values represent statistically significant relationships (i.e. p-values <0.05)
2-Bold and ** indicates marginally statistically significance (p-value <0.07)
Table 1.6. Chi-square and p-values of spirituality associated with risk variables

<table>
<thead>
<tr>
<th>Question Header</th>
<th>Question</th>
<th>Risk Variables (df, N %, p-value)</th>
<th>HIV-infection</th>
<th>STD-infection</th>
<th>Alcohol use</th>
<th>Cocaine use</th>
<th>Crack use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guidance from Higher Power</td>
<td>I always seek guidance from a higher power in times of need.</td>
<td>1122,1124 99% 0.0001 1135,1137 99% 0.0025 1134,1136** 99% 0.0604 1134,1136 99% &lt;0.0001 0.1827</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spiritual Connection</td>
<td>My spiritual connection with a higher power helps me cope with negative beliefs that other people have about homosexuality.</td>
<td>1062,1064 99% 0.0001 1073,1075 99% 0.0001 1072,1074 99% 0.0038 1072,1074 99% 0.1923 1072,1074 99% 0.0022</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spirituality and health</td>
<td>My spiritual beliefs encourage me to do everything I can to stay healthy.</td>
<td>1118,1120 99% 0.0001 1131,1133 99% 0.0074 1130,1132 99% 0.0134 1130,1132 99% 0.3080 1130,1132 99% 0.1837</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total spirituality index</td>
<td></td>
<td>1123,1125 99% 0.0001 1136,1138 99% 0.0001 1135,1137 99% 0.0093 1135,1137 99% 0.2901 1135,1137 99% 0.0296</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

1-Bolded values represent statistically significant relationships (i.e. p-values <0.05)
2-Bold and ** indicates marginally statistically significance (p-value <0.07)
Figure 1.1: Religiosity index responses with corresponding N, and percent from participants

Figure 1.2: Spirituality index responses with corresponding N, and percent from participants
MANUSCRIPT #2

What is the relationship of religiosity, spirituality, and high risk behavior among Black men who have sex with men (Black MSM)?
The Relationship of Religiosity, Spirituality, HIV-infection status, and Polysubstance Abuse among Black Men who Have Sex with Men (MSM)

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Keywords: Black men who have sex with men (Black MSM), HIV risk, HIV-infection, religiosity, spirituality
Pages: 20
Tables: 4
Word Count: 2,504
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ABSTRACT

Religion and spirituality are important for many Black MSM. While many social factors may be associated with the increasing disparity of HIV infection among Black MSM, high levels of religiosity and spirituality prevalent in Black culture may be correlated with high-risk behavior among Black MSM and may help explain this population’s increasing incidence of HIV infection. Using secondary data from the cross-sectional CDC Brothers y Hermanos Study (ByHS), this study used logistic regression to examine associations between high risk sexual behavior (e.g., condom use history, unprotected anal intercourse (UAI), HIV infection status, and STD infection status), religiosity, and spirituality among Black MSM study participants (N = 1,140) to examine whether high risk behavior was predictive of religiosity or spirituality index scores using logistic regression.

Religiosity and spirituality with unprotected receptive anal intercourse better predicted HIV-infection than high risk behaviors alone. Older Black MSM were more religious and participated in higher rates of substance abuse and UAI. Higher levels of spirituality were found among HIV-infected, religious, non-polysubstance abusers.. The present study also found that higher levels of risk behaviors predicted higher religiosity scores and that lower levels of risk behaviors predicted higher spirituality scores. These relationships among Black MSM suggest that future HIV prevention models might incorporate these constructs in order to increase the efficacy of risk reduction interventions.
Introduction

In the US, Blacks typically have a strong association with religion and religious institutions compared to other racial and ethnic groups. A high majority (85%) of Blacks reported that religion is very important to them, and 60% of Black individuals surveyed reported weekly or “regular” church attendance (Pew, 2003; Pew, 2008) compared to other racial/ethnic groups. Persistent differences concerning the acceptance of homosexuality also appear to exist among different racial groups. Research suggests an association between religiosity, spirituality and HIV risk behaviors with several studies finding a positive association between reported high risk behaviors and high religiosity scores among participants and negative associations between high spirituality scores and high risk sexual behaviors including polysubstance use (Luquis, et.al., 2011; Thomas and Freeman, 2011; Wutoh, et al., 2011).

Religion and spirituality are important concepts for Black MSM. A study among Black MSM, (Davis, Aidala, and Lee, 2003) examined the role of religiosity and spirituality and showed that MSM who used alcohol and other drugs had lower religiosity and spirituality scores compared to those who did not. This study also found that religiosity was significantly positively correlated with CD4 Count (e.g., a marker of overall health status among persons living with HIV disease), such that Black MSM with higher CD4 counts had higher spirituality scores, and those with the lowest CD4 Counts gave less importance to religion and participation in religious events. Similarly, Folkman, and colleagues (1992) examined relationships between spirituality, religion, and high risk sexual behavior (unprotected anal intercourse [UAI]) among Black MSM and the findings support a negative correlation between spirituality and high risk behavior among MSM; thus, spirituality was found to be a protective factor against high risk sexual behavior. A study by Kegeles and colleagues (2009) among Black MSM, found religiosity (measured
through church attendance) was positively associated with HIV risk taking behavior, and for this study, religiosity was a risk factor among Black MSM. In summary, these data clearly show varied measures of religiosity and spirituality constructs and suggest complex and important associations between the measures of the constructs and high risk health behaviors among Black MSM.

Improving preventive interventions for this population is timely and important. HIV/AIDS prevalence rates for Blacks are high, and incidence, particularly among Black MSM, is rapidly increasing. Although Blacks account for only 13% of the total United States population, they make up approximately half of the one million Americans living with HIV infection (CDC, 2009). An estimated 1 in 16 Black males in the United States is living with HIV infection (CDC, 2009; CDC 2011). In 2009, the CDC estimated that males represented 73% of new cases of HIV, and Black MSM were at increased risk (CDC, 2009; CDC, 2011). Black men whose sex partners include other men may identify as gay, bisexual, heterosexual or “other than heterosexual”; men in these categories account for 53% of the total cases of HIV/AIDS among US males. Incidence of HIV/AIDS among young persons under age 25 is increasing among all populations and disproportionately among Black MSM, who account for 63% of young adult cases in the U.S. An estimated 40% of Black MSM are HIV-infected, and 25.7% do not know their HIV status (CDC, 2010; MMWR, 2012; Prejean, et. al., 2011).

Because religious tenets for Blacks often condemn homosexuality, Blacks tend to report more negative attitudes regarding homosexuality than Whites and other racial/ethnic groups (Glick & Golden, 2010; Pitt, 2010; Sutton & Parks, 2013). For example, Glick and Golden (2010) found that 72.3% of Blacks surveyed indicated that homosexuality is “always wrong,” compared to 51.8% of White respondents. Of note, is that this attitude toward homosexuality
among Blacks was largely unchanged since the 1970’s, while among White respondents negative perceptions of homosexuality had declined from 70.8% to 51.8% (Glick & Golden, 2010).

Twice as many Black MSM compared to White MSM respondents reported that “homosexuality is always wrong,” (Glick & Golden, 2010). Research suggests that Blacks also tend to experience homophobia, or a negative view of homosexual behavior, in their communities more often than other racial groups (Miller, 2007; Ross et al., 2008). These different attitudes concerning homosexuality observed among Black MSM versus White MSM and higher levels of homophobia experienced by Black MSM versus other MSM may, among other factors, contribute to increased incidence of HIV/AIDS among Black MSM (Glick & Golden, 2010; Pitt, 2010; Sutton & Parks, 2013).

Cognitive Dissonance and Sexual Risk among Black MSM

The strong association of many Blacks with predominately Black religious institutions likely influences their attitudes regarding sexual norms (Pew, 2008; Pitt, 2010; Stokes & Peterson, 1998; Yip, 2002). Due to the negative attitudes of many Black churches regarding sex in general, and homosexuality in particular (Miller, 2007; Wilson and Miller, 2002), many Black MSM report finding themselves in conflict with and rejected by organized religious communities (Fullilove, 2006; Miller, 2007; Ross et al., 2008; Wilson and Miller, 2002; Woodyard, Peterson, & Stokes, 2000). Such conflicts and incongruities between key life areas can lead to increased conflict between one’s sexual behavior and religious and spiritual identity. Cognitive Dissonance Theory (Festinger, 1957) postulates that incongruence between one’s beliefs and behaviors create psychological tension or discomfort that result in emotional and mental distress. It is possible that Black MSM internalize the homonegative (judgmental) messages often present in
their religious and larger community contexts, giving rise to dissonant self-perceptions and gives rise to high risk behavior (Glick & Golden, 2010). Among Black MSM, sexual risk factors, particularly unprotected anal intercourse (i.e., “bare backing”) and sexually transmitted diseases (STDs), account for the high rates of HIV infections observed in this population (Millet, et. al, 2006; Millet & Peterson, 2007). Higher STD incidence among MSM serves as a risk factor because STD infections increases susceptibility to HIV thus, increasing the likelihood of HIV transmission (CDC, 2009; CDC, 2010; Millet, et. al., 2006; Ross, et. al., 2008). An additional HIV risk factor noted in the literature is undiagnosed HIV infection among Black MSM. Some studies (CDC, 2009; Millet, et al, 2006) have shown that nearly two-thirds of new HIV infections are attributed to the 25% of persons who do not know their HIV status (CDC, 2009; CDC, 2010; Millet, et al, 2006; Millet & Peterson, 2007). Substance abuse is another HIV transmission risk factor among Black MSMs (CDC, 2009; Millet, et. al., 2006; Murray, et. al., 2007). Persons who abuse substances may experience lower inhibition and may engage in riskier sexual behaviors, including sex with multiple sexual partners and unprotected sexual intercourse with individuals of unknown HIV status (Malebranche, 2003; Marks, et. al., 2009).

The current study uses Cognitive Dissonance Theory as a conceptual framework for the hypothesis that religiosity is associated with elevated rates of UAI, polysubstance abuse, HIV-infection, STD-infection, among Black MSM, and that spirituality serves to mitigate high-risk behavior among Black MSM and is associated with lower rates of UAI, polysubstance abuse, HIV and STD infection among Black MSM. This study examines relationships between religious and spiritual practices and HIV risk behaviors among Black MSM. Results of this analysis might inform the design and effectiveness of future HIV prevention interventions for the Black MSM population (Beatty, et. al., 2005; Miller, 2007).
Methods

Description of the data sample

The present study used a sub-set of data from the 2005 Brothers y Hermanos (ByHS) study conducted by the Centers for Disease Control and Prevention (CDC). As described in detail in prior works (e.g., Marks, et. al, 2009; Watkins, et. al., 2013a) ByHS collected demographic, background, and risk data on a representative sample of 1,141 Black MSM (601 from New York City and 540 from Philadelphia) and included questions on both religiosity and spirituality. Table 2.1 presents sample demographics.

Insert Table 2.1 Here
Measures

Because the study data were cross-sectional, religiosity and spirituality were examined as independent variables and risk variables as the dependent variables. The independent variables are presented in the table below.

<table>
<thead>
<tr>
<th>Insert Table 2.2 Here</th>
</tr>
</thead>
</table>

For this study sexual risk was assessed using: 1) condom use history in the last 3 months, 2) unprotected anal intercourse in the past 3 months-(UAI)-both receptive and insertive, 3) sexual transmitted disease infection status, and 4) HIV infection status. Because polysubstance use can contribute to high risk behavior, it is reported in Table 2.3.

<table>
<thead>
<tr>
<th>Insert Table 2.3 Here</th>
</tr>
</thead>
</table>

As described in detail in Watkins, et. al., 2013a, a religiosity index was created (Hsueh-Sheng Wu, 2012) by summing the scale responses of these four questions Worship (0-4) + Openness (0-4) + Religious Beliefs (0-4) + Choosing Religious Beliefs (0-4) to develop a composite sum of the responses of the four original ByHS religiosity questions. There were a total of 1,141 responses to this question the highest percentage (9%) were those participants with a total sum of 9 (N=110), 10 (N=102), and 12 (N=92).

Similarly, a spirituality index was developed (Hsueh-Sheng Wu, 2012) by summing guidance (0-4) + spiritual connection (0-4) + spirituality and health (0-4). A total of 1141 responses were received for each of these three questions with the highest percentages calculated from response score totals of 9 (16%, N=183), 11 (13%, N=149), and 12 (44%, N=493).
Analyses

To examine which risk variables were significantly correlated with both religiosity and spirituality, this study utilized a correlation matrix of previously identified risk variables derived from the literature (CDC, 2009; Millet, et. al., 2006). Univariate comparisons were made between religiosity, spirituality and demographic variables (e.g., age, race, socioeconomic status). Risk variables were identified previously (see Watkins et al, 2013a) through a series of chi-square tests between religiosity and spirituality as independent variables and risk as outcome variables. Spearman’s correlations were used to examine relationships between religiosity and spirituality and the risk variables noted above.

Both religiosity and spirituality were significantly associated with HIV-infection. HIV infection status, in and of itself, is not a risk behavior, but indicates prior high sexual risk behavior (Beatty, et, al., 2004; CDC, 2009).

The significantly associated risk variables for HIV-infection (which were identified by using a correlation matrix), were included in several regression models that examined predictive relationships among high risk behavior, age, education and HIV-infection among Black MSM (See Table 2.4).

Model C, which had the lowest AICC, and best adjusted R-squared that included religiosity and spirituality was the best fit model to predict HIV-infection. This model, which included religiosity, spirituality, and age had fewer variables; however, a better ability to predict HIV-infection among Black MSM.
Discussion

Consistent with prior research on risk behaviors among Black MSM (CDC, 2009; Malebranche, 2003; Marks, et. al., 2009; Martin & Knox, 1997; Miller, 2007, Millet et. al, 2006), this study hypothesized that higher risk behaviors would predict higher religiosity scores and that lower risk behaviors among Black MSM would predict higher spirituality scores. That is, religiosity would prove to be a risk factor and that spirituality would prove to be protective factor therefore lessening the risk of HIV infection among Black MSM. Even though religiosity and spirituality were positively correlated with each other, they had differential associations with risk variables, suggesting that the two are related but distinct constructs. Both religiosity and spirituality were predictive of HIV-infection, such that more religious Black MSM were more likely to be HIV-negative, while the more spiritual Black MSM were more likely to be HIV-positive. Given the lack of temporal association available in data set, we were unable to conclude whether these levels differed before or after HIV-infection.

Religiosity and spirituality constructs were predicted by different risk variables. Religiosity was predicted by age, level of spirituality, HIV-infection status and non-prescription substance abuse. More religious Black MSM (i.e. those with higher religiosity scores) tended to be older, abusers of more substances, report higher beliefs in God, and to be HIV-negative. . Spirituality was predicted by level of religiosity, history of STD infection status, HIV-infection status, and non-prescription substance abuse, such that Black MSM having lower spirituality scores tended to be HIV and STD negative, polysubstance abusers, and not religious.

As an indirect indictor of high sexual risk behavior, HIV-infection status was expected to predict higher religiosity scores rather than higher spirituality scores. This study found that HIV-infection predicted higher levels of spirituality. Given the lack of temporal association known in this study, between HIV-infection, religiosity, and spirituality, as well as the possible
confounding relationships that exists between religiosity, spirituality, and the examined risk variables, it is possible that the degree of religiosity and spirituality could augment or abate upon knowledge of HIV-infection. Spirituality for certain Black MSM may assist them in achieving cognitive consonance and thus more apt to address their high risk behavior.

Considering the relationships found in the present study, which tentatively and selectively support the initial hypotheses that higher levels of religiosity may promote higher levels of HIV risk behavior and that higher levels of spirituality may promote lower risk behavior among Black MSM, a recommended course for future HIV prevention interventions is to further examine the role religion and spirituality can have in minimizing high risk behaviors and sexual behaviors, particularly among younger Black MSM. In addition, future research should examine how spirituality can enhance HIV treatment programs among older, HIV-positive Black MSM.

Limitations

First, a cross sectional study design introduces the possibility of confounding factors that may confound the relationships described in the models presented in this paper. Second, the ByHS data set includes seven specific religiosity/spirituality variables (i.e., 4 religiosity, and 3 spirituality). This limits, to some extent, the depth with which these domains can be examined. However, at this time, there are few studies of religiosity/spirituality in relation to HIV risk in Black MSM in the literature. Third, the survey relied on the self-report of risk behaviors, which may not accurately reflect the true risk behaviors, although collected by confidential computer assisted methods. A final limitation is the relationships between the constructs analyzed are multifaceted and interrelated so conclusions from this paper are exploratory and may only be cursory.
Summary

This study was conducted to better understand the relationship of sexual risk behaviors, high risk behavior, and religiosity and spirituality among Black MSM. The present study found that unprotected anal intercourse, (UAI), and polysubstance use, predicted higher religiosity scores, and lower levels of these risk behaviors were predictive of higher spirituality scores. With the findings obtained from this study, more culturally specific and appropriate prevention interventions can be developed that incorporate religiosity and spirituality components to decrease HIV-infection among Black MSM.

Implications

This study examined the potential relationships among religiosity, spirituality, and high sexual and high risk behaviors among Black MSM and using the cognitive dissonance theory found significant relationships existed among religiosity, spirituality, and high risk behaviors. This paper concluded that religiosity and spirituality were better predictors of HIV-infection among Black MSM. A next step would be to examine the difference in levels of religiosity, spirituality, and cognitive dissonance, among HIV-infected Black MSM to ascertain if these relationships can promote less risk taking behavior. The more spiritual Black MSM may adhere more readily to biomedical and social interventions.
References


Table 2.1  Participant characteristics of black men who have sex with men, Brothers y Hermanos Study, 2005–2006

<table>
<thead>
<tr>
<th></th>
<th>n/N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black Hispanic</td>
<td>11/1141</td>
<td>1.0</td>
</tr>
<tr>
<td>Non-Hispanic</td>
<td>1130/1141</td>
<td>99.0</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full time</td>
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<td>25.0</td>
</tr>
<tr>
<td>Part time</td>
<td>284/1137</td>
<td>25.0</td>
</tr>
<tr>
<td>Unemployed</td>
<td>455/1137</td>
<td>40.0</td>
</tr>
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<td>Disabled</td>
<td>114/1137</td>
<td>10.0</td>
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<tr>
<td><strong>Student Status</strong></td>
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<tr>
<td>Full time</td>
<td>114/1137</td>
<td>10.0</td>
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<tr>
<td>Part time</td>
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</tr>
<tr>
<td>None</td>
<td>852/1137</td>
<td>75.0</td>
</tr>
<tr>
<td><strong>Sexual Orientation</strong></td>
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<tr>
<td>Homosexual</td>
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</tr>
<tr>
<td>Bisexual</td>
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<td>22.5</td>
</tr>
<tr>
<td>Other</td>
<td>29/1137</td>
<td>2.5</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
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</tr>
<tr>
<td>Married to female</td>
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<td>2.5</td>
</tr>
<tr>
<td>Divorced</td>
<td>84/1116</td>
<td>7.5</td>
</tr>
<tr>
<td>Single</td>
<td>268/1116</td>
<td>90.0</td>
</tr>
<tr>
<td><strong>Health Insurance</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>114/1139</td>
<td>10.0</td>
</tr>
<tr>
<td>Medicaid</td>
<td>740/1139</td>
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<tr>
<td>Medicare</td>
<td>171/1139</td>
<td>15.0</td>
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<tr>
<td>Private</td>
<td>114/1139</td>
<td>10.0</td>
</tr>
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</table>
Table 2.2 Independent variable characteristics presented with variable name, number and corresponding percent of black men who have sex with men, Brothers y Hermanos Study, 2005–2006

<table>
<thead>
<tr>
<th>Worship (dichotomous)</th>
<th>n/N</th>
<th>%</th>
<th>Worship (categorical)</th>
<th>n/N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing</td>
<td>5/1141</td>
<td>1.0</td>
<td>Missing</td>
<td>5/1141</td>
<td>1.0</td>
</tr>
<tr>
<td>Never</td>
<td>281/1141</td>
<td>25.0</td>
<td>Never</td>
<td>281/1141</td>
<td>25.0</td>
</tr>
<tr>
<td>Some</td>
<td>855/1141</td>
<td>74.0</td>
<td>Some</td>
<td>254/1141</td>
<td>22.0</td>
</tr>
<tr>
<td>Monthly</td>
<td>350/1141</td>
<td>30.0</td>
<td>Monthly</td>
<td>350/1141</td>
<td>30.0</td>
</tr>
<tr>
<td>Weekly</td>
<td>251/1141</td>
<td>22.0</td>
<td>Weekly</td>
<td>251/1141</td>
<td>22.0</td>
</tr>
</tbody>
</table>

Open About Sexuality (dichotomous)

<table>
<thead>
<tr>
<th>Guidance from higher power</th>
<th>n/N</th>
<th>%</th>
<th>Spiritual connection</th>
<th>n/N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing</td>
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<td>26.0</td>
<td>Missing</td>
<td>4/1141</td>
<td>1.0</td>
</tr>
<tr>
<td>No beliefs</td>
<td>547/1141</td>
<td>48.0</td>
<td>No beliefs</td>
<td>57/1141</td>
<td>5.0</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>705/1141</td>
<td>62.0</td>
<td>Strongly agree</td>
<td>618/1141</td>
<td>56.0</td>
</tr>
<tr>
<td>Agree somewhat</td>
<td>270/1141</td>
<td>24.0</td>
<td>Agree somewhat</td>
<td>289/1141</td>
<td>26.0</td>
</tr>
<tr>
<td>Disagree</td>
<td>48/1141</td>
<td>4.0</td>
<td>Disagree</td>
<td>84/1141</td>
<td>7.0</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>57/1141</td>
<td>5.0</td>
<td>Strongly disagree</td>
<td>69/1141</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Open about sexuality (Likert scale)

<table>
<thead>
<tr>
<th>Religious beliefs and sex with men (Likert scale)</th>
<th>n/N</th>
<th>%</th>
<th>Spirituality and Health</th>
<th>n/N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing</td>
<td>10/1141</td>
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<td>Missing</td>
<td>8/1141</td>
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</tr>
<tr>
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<td>159/1141</td>
<td>14.0</td>
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<td>5.0</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>279/1141</td>
<td>24.0</td>
<td>Strongly agree</td>
<td>716/1141</td>
<td>63.0</td>
</tr>
<tr>
<td>Agree somewhat</td>
<td>169/1141</td>
<td>15.0</td>
<td>Agree somewhat</td>
<td>270/1141</td>
<td>24.0</td>
</tr>
<tr>
<td>Disagree somewhat</td>
<td>233/1141</td>
<td>20.0</td>
<td>Disagree</td>
<td>56/1141</td>
<td>5.0</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>291/1141</td>
<td>26.0</td>
<td>Strongly disagree</td>
<td>32/1141</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Choses religious beliefs versus sex with a man

| No religious beliefs | 17/1141 | 1.5  | No religious beliefs           | 17/1141 | 1.5  |
| Strongly agree       | 383/1141 | 34.0 | Strongly agree                 | 383/1141 | 34.0 |
| Agree somewhat       | 185/1141 | 16.0 | Agree somewhat                 | 185/1141 | 16.0 |
| Disagree somewhat    | 192/1141 | 17.0 | Disagree                       | 192/1141 | 17.0 |
| Strongly disagree    | 191/1141 | 17.0 | Strongly disagree              | 191/1141 | 17.0 |

Please refer to Figure 2.2 and Figure 2.4. Religiosity questions were four: 1) worship, 2) openness about sexuality, 3) religious beliefs, and 4) choosing religious beliefs vs. sex with men. The spirituality questions were three: 1) guidance, 2) spiritual connection, and 3) spirituality and health.
Table 2.3 Outcome variable characteristics of black men who have sex with men, Brothers y Hermanos Study, 2005–2006

<table>
<thead>
<tr>
<th>Variable</th>
<th>n/N</th>
<th>%</th>
<th>Crack Use</th>
<th>n/N</th>
<th>%</th>
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<td>Condom Use History</td>
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<td>Missing</td>
<td>2/1141</td>
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<td>Missing</td>
<td>2/1141</td>
<td>1.0</td>
</tr>
<tr>
<td>No</td>
<td>761/1141</td>
<td>67.0</td>
<td>No</td>
<td>757/1141</td>
<td>66.0</td>
</tr>
<tr>
<td>Yes</td>
<td>378/1141</td>
<td>31.0</td>
<td>Yes</td>
<td>382/1141</td>
<td>33.0</td>
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<tr>
<td>Receptive Anal Sex</td>
<td></td>
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<td></td>
</tr>
<tr>
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<td>558/1141</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1141</td>
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<td></td>
<td></td>
<td></td>
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<td>Yes</td>
<td>175/1141</td>
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<td></td>
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<tr>
<td>Insertive Anal Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>558/1141</td>
<td>49.0</td>
<td></td>
<td></td>
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<tr>
<td>No</td>
<td>297/1141</td>
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<td>Yes</td>
<td>286/1141</td>
<td>25.0</td>
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<td>STD infection (ever diagnosed)</td>
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<td>0.0</td>
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<td></td>
<td></td>
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<tr>
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<td>33.0</td>
<td></td>
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<td>Cocaine Use</td>
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<td>Missing</td>
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<tr>
<td>No</td>
<td>369/1141</td>
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<td>Yes</td>
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<tr>
<td>Alcohol use</td>
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<td>Missing</td>
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<td></td>
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<td></td>
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<tr>
<td>No</td>
<td>394/1141</td>
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<td></td>
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<tr>
<td>Yes</td>
<td>744/1141</td>
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<tr>
<td>Binge alcohol use</td>
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<td>Missing</td>
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<td>Monthly</td>
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<tr>
<td>&gt;Monthly</td>
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<td>Methamphetamine Use</td>
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<tr>
<td>No</td>
<td>1102/1141</td>
<td>3.0</td>
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<td></td>
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<tr>
<td>Yes</td>
<td>35/1141</td>
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<td></td>
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<tr>
<td>Depression (with in last week)</td>
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<td>3/1141</td>
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<tr>
<td>None</td>
<td>179/1141</td>
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<td></td>
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<tr>
<td>1-2 days</td>
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<tr>
<td>3-6 days</td>
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<td></td>
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<tr>
<td>&gt; 6 days</td>
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Table 2.4 Odds ratios and P-values of prediction models to predict HIV infection relative to religiosity and spirituality

<table>
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<tr>
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<th>Model A</th>
<th>Model B</th>
<th>Model C</th>
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<td>720.034</td>
<td>742.881</td>
<td>718.401</td>
</tr>
<tr>
<td>R squared Adjusted</td>
<td>0.111</td>
<td>0.073</td>
<td>0.112</td>
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<td>Religiosity</td>
<td>-1.11</td>
<td>NA</td>
<td>-1.12</td>
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<tr>
<td></td>
<td>&lt;0.0001</td>
<td></td>
<td>&lt;0.0001</td>
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<tr>
<td>Spirituality</td>
<td>0.89</td>
<td>NA</td>
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</tr>
<tr>
<td></td>
<td>0.0006</td>
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<td>0.0003</td>
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<tr>
<td>Age</td>
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<td>0.95</td>
<td>0.95</td>
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<td></td>
<td>&lt;0.0001</td>
<td>&lt;0.0001</td>
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<tr>
<td>Education Level</td>
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<td></td>
<td>0.5561</td>
<td>0.3861</td>
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<tr>
<td>Unprotected Anal Intercourse</td>
<td>0.79</td>
<td>0.74</td>
<td>NA</td>
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<tr>
<td></td>
<td>0.2775</td>
<td>0.1626</td>
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</tr>
<tr>
<td>Unprotected Receptive Anal</td>
<td>2.41</td>
<td>2.55</td>
<td>2.17</td>
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<tr>
<td>Bottom Intercourse</td>
<td>&lt;0.0001</td>
<td>&lt;0.0001</td>
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<tr>
<td>Unprotected Insertive Anal</td>
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<td>0.99</td>
<td>NA</td>
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<tr>
<td>(Top) Intercourse</td>
<td>0.9575</td>
<td>0.9671</td>
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</tbody>
</table>

1 – Data are shown as Odds ratios, p-values.
2 – Lower AICC values indicate a better fitting model.
3 – Higher R-Squared Adjusted statistic indicates better predictability of model.
4 – Bold values represent statistically significant associations, p<0.05
What is the relationship of religiosity, spirituality, substance abuse and depression in Black MSM?
The Relationship of Religiosity, Spirituality, Substance Abuse, and Depression among Black Men who Have Sex with Men (MSM)

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Stacey S Cofield, PhD
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Connie Kohler, PhD
Stuart Usdan, PhD

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Keywords: Black men who have sex with men (Black MSM), religiosity, spirituality, and depression; substance abuse and Black MSM, religiosity, spirituality

Pages: 31
Tables: 9
Word Count: 2,847
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ABSTRACT

HIV infection rates continue to disproportionately affect Black men who have sex with men (Black MSM) compared to other groups. Research has shown that higher rates of substance use and higher levels of depression are positively correlated with higher sexual risk behavior. While many social factors may be associated with the increasing disparity of HIV infection among Black MSM, little research has examined relationships between high levels of religiosity and spirituality prevalent in Black culture and issues of substance use and depression among Black MSM. Such research may increase understanding of the increasing incidence of HIV infection among Black MSM. Using a data set from the Centers for Disease Control and Prevention, Brothers y Hermanos Study (ByHS), this paper examined associations between substance use, depression, religiosity, and spirituality among Black MSM study participants (N = 1,140).

Black MSM who had higher spirituality scores reported fewer instances of polysubstance abuse and depression, while higher religiosity scores were associated with higher rates of polysubstance abuse and depression. Black MSM who reported higher levels of spirituality experienced lower levels of depression and substance use while some Black MSM who reported higher religiosity scores abused more substances and had higher rates of depression typifying a positive association with religiosity. These relationships suggest that future HIV prevention models might incorporate religiosity and spirituality in order to increase the efficacy of risk reduction interventions, which acknowledge and incorporate depression and substance abuse issues and some of their potential underlying causes among Black MSM.
Introduction

The relationship between substance use and depression for Black Men who have Sex with Men (Black MSM) is clearly a multi-faceted issue. Successful HIV risk reduction for Black MSM likely should incorporate behavioral, social, and medical factors in the design of interventions to reduce new HIV infections among this population (CDC, 2009; Fullilove 2006). Given the unique role that the social factors of religion and spirituality play in the lives of Black MSM, the need to understand the roles of these variables and their effect on risk-taking behavior among this population may be particularly important.

Research involving depression and high risk behaviors among Black MSM

Depression among Black MSM is a prevalent issue. Research has shown more prominent depression rates among Black MSM compared to other populations. Rates of depression among Black MSM were 33% higher (Reisner, et. al., 2009) when compared to depression rates among heterosexual Black men and other MSM populations (Cochran and Mays, 1994; Peterson et. al., 1996). Several studies (Reisner, et. al., 2009; Cochran and Mays, 2000; Meyer, et. al., 2008) found higher rates of depression among MSM compared to the general adult male population, with rates of 15 to 26% for MSM compared to 5-12% for the general adult male population.

These rates of depression have been associated with higher risk behavior among Black MSM. Higher rates of depression have been positively associated with higher levels of sexual risk behavior among Black MSM (Alvy, 2011; Crawford, 2002; Perdue, et. al., 2003; Stall, et. al., 2003). For example, Meyer et. al, (2008) found that depression predicted high risk behavior among a subsample of Black MSM and Black men who have sex with men and women (MSM/W). Similarly, Alvy (2010), Klobin (2006), and Stall (2003) reported positive associations with depression and high-risk behavior among MSM. These studies found positive
relationships in both HIV-infected and HIV-uninfected participants (Klobin, et., al., 2003; Parsons, 2003; Reisner, et., al., 2009; Stall, et. al, 2003). Similarly, Reisner, et. al. (2009) reported that Black MSM who reported unprotected anal sex were nine times as likely compared with other MSM to be depressed, and those diagnosed with an STI were six times compared with other MSM as likely to be depressed.

Prior research examining the relationship between religion, spirituality, and depression found protective associations between spiritually and depression as well as religion and depression, although these studies did not examine these relationships among Black MSM in particular. Rasic, et. al, (2011), found religiosity was associated with lower odds of depression and higher rates of religious attendance was associated with lower rates of depression (protective) among a sample of 1,615 adolescents. Similarly, Cotton, et. al., (2006), that among 134 adolescents that higher levels of spirituality were associated with fewer depressive symptoms and so an inverse relationship between depression and spirituality was found.

Research involving substance use and high risk behaviors among Black MSM

Research has shown a positive association between substance use and high risk behavior among MSM regardless of HIV serostatus (Boone, et. al., 2012; Bruce, et. al., 2012; Klobin, et al., 2003; VanDevanter, et. al., 2011). Studies found methamphetamine, cocaine, and alcohol use are the primary substances most associated with high risk behavior among MSM (Bruce, et. al., 2012; Colfax, et. al., 2005; Garafolo, et. al., 1998; Mustanski, 2008). In a recent literature review analyzing event level substance use immediately before or during a sexual encounter among MSM, Vosburg, et. al, (2012), found methamphetamine use and binge alcohol use to be most likely associated with unprotected sexual behavior.
Studies also examined the relationship between religiosity, spirituality, and substance use, although not specifically among Black MSM. Findings showed a negative relationship between religiosity, spirituality, and substance abuse (Piko, et. al., 2004). In a study among college students, those with higher spirituality and religiosity scores reported the lowest level of substance use (Dennis, et. al., 2009). Similarly Piko and Fitzpatrick, (2004), found religion to be protective in regards to alcohol use among adolescent participants confirming the association between substance use, religiosity, spirituality, and risk behavior. Therefore the relationship between religiosity, spirituality, and risk can be positively or negatively associated.

Because Blacks in the United States Blacks typically have a strong association with religion and religious institutions compared to other racial and ethnic groups, understanding how religiosity and spirituality may interact with depression and substance use in increased HIV risk behaviors among Black MSM is a critically important issue. A recent national survey of religious behaviors and beliefs found that, relative to other racial and ethnic groups, Blacks are more likely to report a formal religious affiliation (Glick & Golden, 2010, Pew, 2003, 2008; Pitt, 2010). A high majority (85%) of Blacks reported that religion is very important to them, and 60% of Black individuals surveyed reported weekly or “regular” church attendance (Pew, 2008) compared to 20% among other racial/ethnic groups.

Given the high prevalence and incidence rates for Blacks in the U.S. (CDC, 2009), understanding how religiosity and spirituality may interact with depression and substance use and increased HIV risk behaviors among Black MSM is imperative. Although Blacks account for only 13% of the total United States population, they make up approximately half of the 1 million Americans living with HIV infection (CDC, 2010; Prejean, et. al., 2011). An estimated 1 in 16 Black males in the United States is living with HIV infection, and 73% of new cases of
HIV in 2009 were among males, with MSM at increased risk, and Black MSM account for 53% of the total cases of HIV/AIDS among US males (CDC, 2010; Prejean, et. al., 2011).

Given that national-level studies have found that Black MSM have higher religious affiliation than other racial/ethnic groups, Black MSM may also be at increased risk of cognitive dissonance in relating their sexuality and spirituality (Miller, 2005) and may develop a means to address this dissonance that influences their behavior (Fullilove, 2006; Millet, et. al, 2006). A few studies (e.g., Rodriquez, 2010; Rodriquez & Ouellette, 2010) identified methods through which Black MSM dealt with cognitive dissonance including: 1) rejecting the religious identity and divorcing oneself from the Christian religion; 2) rejecting homosexual identity, e.g., the individual seeks to become heterosexual through conversion therapy, 3) compartmentalization, e.g., the individual keeps both identities separate to achieve identity consonance, and 4) identity integration, e.g. the individual resolves threats to new identity and seeks to reconcile new identity as a new sexual-spiritual self. Some research suggests that religiosity is associated with cognitive dissonance among many Black MSM (Kegeles, et. al., 2009) and can be associated with higher rates of substance use, and depression (Mahaffy, 1996; Martin & Knox, 1997; Miller, 2007; Millet and Peterson, 2007; Millet, et. al., 2006).

The current study incorporates the theory of cognitive dissonance as a conceptual framework to hypothesize that religiosity is associated with elevated levels of dissonance among Black MSM and gives rise to higher rates of polysubstance abuse, and depression, among Black MSM (Aronson, 2007), and that spirituality serves to achieve cognitive consonance and is associated with lower rates of polysubstance abuse, and depression among Black MSM. This paper examined relationships between substance abuse, depression, religious and spiritual factors among Black MSM to highlight relationships that can enhance the development and
effectiveness of future HIV prevention interventions for Black MSM (Beatty, et. al., 2005; Miller, 2007).
Methods

Description of the data sample

The present study used a sub-set of data from the CDC 2005 Brothers y Hermanos Survey (ByHS). ByHS is a sample of 1,141 Black MSM (601 from New York City and 540 from Philadelphia). As described in prior papers (Marks, et. al., 2009; Watkins, et. al., 2013a), the ByHS identified participants with an average age of 41.5 years ranging from ages 18 to 71 years old. Participant demographics are shown in Table 1. As Table 3.1 shows, the vast majority of the sample identified as Black, single/never married, and homosexual or gay. Education and employment were more variable, with the typical educational attainment being high school graduate. The average annual income of the participants was below the Federal poverty level. Most were insured, and approximately half reported currently being in a committed relationship.

Insert Table 3.1 Here
Measures

Predictor Variables

This study examined polysubstance use as alcohol use along with eight other illicit substances as well as depression. Depression was reported in two variables, 1) “ever been depressed” and expressed as days depressed in past week, and 2) days respondents have been depressed, which measures depression within the last 30 days. Polysubstance use and depression are reported in the Table 3.2

______________________________________________________________________________
Insert Table 3.2 Here

______________________________________________________________________________

Outcome Variables

The outcome variables were religiosity, which consisted of four questions; and spirituality which consisted of three questions. These measures were presented with scale responses as noted in Table 3.3.

______________________________________________________________________________
Insert Table 3.3 Here

______________________________________________________________________________
As described in detail in Watkins, et. al., 2013a, a religiosity index was created from four questions Worship (0-4) + Openness (0-4) + Religious Beliefs (0-4) + Choosing Religious Beliefs (0-4) to develop a composite sum of the responses to the four original ByHS religiosity questions. There were a total of 1,141 responses to each of the religiosity questions the highest percentage (9%) were those participants who answered the 4 questions with a total sum of 9 (N=110), 10 (N=102), and 12 (N=92).

Similarly, a spirituality index was created by summing guidance (0-4) + spiritual connection (0-4) + spirituality and health (0-4). A total of 1141 responses were received for each of the spirituality questions with the highest percentages calculated from response score totals of 9 (16%, N=183), 11 (13%, N=149), and 12 (44%, N=493).
Results

For both religiosity and spirituality, Spearman’s associations were conducted between individual substance use, non prescription substance use, depression (past week), and depression (past month) variables. As noted in Table 3.4, religiosity was negatively associated with ecstasy and poppers use and positively associated with cocaine and crack use. Spirituality was significantly negatively associated with alcohol, cocaine, and crack use among Black MSM.

Religiosity and spirituality were examined both as indices and as their individual sub-component questions with both of the depression variables, crack, cocaine, and alcohol use variables. Tables 3.5 and 3.6 report these associations. The religiosity index was significantly associated with depression (last week), cocaine use, crack use; poppers use, and marginally associated with ecstasy use.

The spirituality index was significantly associated with both alcohol and crack use, but not significantly associated with either depression variable.

A series of logistic regression analysis were conducted to determine the significant associations between the depression (past week and past month), substance use, religiosity and
Among Black MSM, Religiosity was significantly positively associated with use of cocaine (OR=0.95, p=.0013), and crack (OR=0.94, p=0.0001), and negatively associated with the use of poppers (OR=−1.05, p=0.0334). Spirituality was negatively associated with alcohol use (OR=−1.06, p=0.0093), and with crack use (OR=−1.05, p=0.0296). The spirituality index was not significantly associated with either depression variable.

We also examined associations between depression, substance use, using religiosity, and spirituality as outcome variables. Parameter estimates and p-values of substance abuse and depression variables with significant relationships to religiosity are reported in the table 3.7:

| Insert Table 3.7 Here |

Given the significant associations noted in table 3.7, the best fit model is noted in table 3.8 with an adjusted R-square = 0.02 and Max R-square of 0.075, which includes the individual substances of crack and cocaine use in addition to the interaction on of substance use and depression. These are all significantly associated with religiosity and serve to better account for higher religiosity scores among Black MSM.

| Insert Table 3.8 Here |

Spirituality was not significantly associated with the non-prescription substance use or depression (neither continuous nor categorical). However, when the spirituality variable was examined with the individual substances, there were significant negative associations between crack cocaine use, and alcohol use possibly due to confounding relationships that may exist between variables. A simple Logistic Regression Analysis Model was conducted to further
demonstrate the significant associations with the spirituality variable along with depression, both continuous and categorical, nonprescription substance use, and the interaction variable of non-prescription substance use and depression.

Insert Table 3.9 Here
Discussion

Religiosity and spirituality were associated with substance use among Black MSM. Black MSM with higher religiosity scores also tended to report more use of crack, cocaine, and poppers, as well as reporting being depressed in the past week. Those Black MSM with higher spirituality scores reported less use of alcohol and crack cocaine. Spirituality was not significantly associated with ever being depressed or being depressed in the last week.

When depression was examined along with polysubstance use as they relate to religiosity and spirituality there were significant associations present. Specifically, Black MSM who reported being depressed and using cocaine (both crack and powder) had higher religiosity scores. Black MSM who were depressed and using substances had higher overall religiosity scores. Black MSM with higher spirituality scores tended to report no depression, and less substance use. Age was not significantly associated with depression or substance use among Black MSM.

Consistent with the primary study hypothesis, one possible explanation for these findings is that Black MSM who reported higher religiosity scores also abused more substances and had higher rates of depression typifying higher levels of cognitive dissonance. These higher religiosity scores and higher levels of dissonance were associated with higher rates of substance abuse, higher risky behavior (Alvy, et.al, 2010; Reisner, et. al., 2009, Parsons, et. al., 2012).

Black MSM with higher spirituality scores reported less crack and alcohol use. Spirituality scores were not significantly changed among those who reported using substances or being depressed. There were no significant differences in spirituality scores among Black MSM who reported being depressed or those who were both using substances and were depressed.

In this study, Black MSM who reported higher levels of spirituality experienced lower levels of substance use such that spirituality seemed to mitigate risky behavior (Reisner, et. al,
2009) and possibly be explained by cognitive consonance among certain Black MSM. This finding is consistent with current research which found that Black MSM who report lower levels of depression and substance abuse tend to participate in less risky behavior (Alvy, et.al, 2010; Reisner, et. al., 2009).

Although religiosity and spirituality were highly correlated they were correlated with distinct variables, and they were associated with different patterns of individual substance use indicating they are distinct but related constructs. Few studies have attempted to parse out differences among religiosity and spirituality variables, and such research is almost non-existent among Black MSM. Understanding how these variables relate, and differ, is an important avenue for future research.

Limitations

One limitation existed in the recruitment of participants in that a majority of respondents were associated with agencies or individuals associated with HIV specific community based organizations and so may have different or even less biases than Black MSM overall. Another limitation is the use of the cross-sectional study design introduces the possibility of measured and unmeasured confounding factors and causality cannot be inferred from the associations presented in this study. An additional limitation was the religiosity and spirituality items available in the ByHS data set are not part of standardized scales. This limits comparisons of findings from this study to other studies that have relied on standardized measures. However, past research has not found clear-cut, gold standard religiosity/spirituality scales for use among risk behavior research, and none have been used with the Black MSM population making these data, a valid resource with which to approach this study’s questions.
Summary

Those individuals who had higher spirituality scores reported fewer instances of polysubstance abuse and depression, while those with higher religiosity scores reported more instance of polysubstance abuse and depression and so overall among Black MSM, religiosity seemed to be a risk factor and spirituality seemed to be a protective factor as correlations of risky behavior particularly polysubstance use. Considering the relationships found in this study of religiosity, spirituality, and substance use among Black MSM, namely that those individuals who had higher spirituality scores reported fewer instances of polysubstance abuse and depression and cognitive consonance, while those with higher religiosity scores reported more instance of polysubstance use and depression, and thus cognitive dissonance, a recommended course for future HIV prevention interventions is to examine the role religiosity and spirituality can have in augmenting or mitigating risky behavior among Black MSM.

Future Implications

Given that both religiosity and spirituality were correlated with substance use and depression among Black MSM, specifically higher levels of religiosity were associated with polysubstance abuse, and depression and higher levels of spirituality were associated with lower reports of depression and substance use, future studies should consider incorporation of both religion and spirituality as constructs in an effort to better understand the relationships between cognition (dissonance and consonance) and risk behavior among Black MSM. With the new knowledge obtained by this study, culturally specific and appropriate prevention interventions that incorporate a religious and/or spirituality component can better inform existing prevention programs or serve as standalone models to decrease HIV-infection among Black MSM.
References


TABLES
Table 3.1  Participant characteristics of black men who have sex with men, Brothers y Hermanos Study, 2005–2006

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Table 3.2 Substance abuse variables of black men who have sex with men, Brothers y Hermanos Study, 2005–2006

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Table 3.3 Outcome variable characteristics presented with variable name, number and corresponding percent of black men who have sex with men, Brothers y Hermanos Study, 2005–2006

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Please refer to Figure 3.2 and Figure 3.4. Religiosity questions were four: 1) worship, 2) openness about sexuality, 3) religious beliefs, and 4) choosing religious beliefs vs. sex with men. The spirituality questions were three: 1) guidance, 2) spiritual connection, and 3) spirituality and health.
Table 3.4. Spearman associations and p-values associated with religiosity and spirituality

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<td>0.0038</td>
<td>0.8974(^3)</td>
<td>Depression (within 30 days)</td>
<td>-0.0225</td>
<td>0.4494(^3)</td>
</tr>
<tr>
<td>(within 30 days)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>0.0018</td>
<td>0.9509(^3)</td>
<td>Depression (last week)</td>
<td>-0.0230</td>
<td>0.4392(^3)</td>
</tr>
<tr>
<td>(last week)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 – Higher values indicate stronger relationship between variables.
2 – Negative values indicate reciprocal or inverse relationships between variables.
3 - Non significant p-values included to illustrate relationship between significant (p<0.05) and non-significant (p>0.05) associations with substance use, depression, religiosity and spirituality.
<table>
<thead>
<tr>
<th>Religiosity Questions</th>
<th>Question</th>
<th>Depression (last week)</th>
<th>Cocaine use</th>
<th>Crack use</th>
<th>Poppers use</th>
<th>Ecstasy use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worship</td>
<td>How often have you attended a place of worship (e.g., church, temple, mosque) during the past 6 months other than for a wedding or funeral?</td>
<td>1121, 1123 99%</td>
<td>1123, 1125 99%</td>
<td>1133, 1135 99%</td>
<td>1133, 1135 99%</td>
<td>1121, 1123 99%</td>
</tr>
<tr>
<td>Open about sexuality</td>
<td>I am able to be open about my sexuality in my religious community.</td>
<td>838, 840 99%</td>
<td>845, 847 99%</td>
<td>845, 847 99%</td>
<td>845, 847 99%</td>
<td>845, 847 99%</td>
</tr>
<tr>
<td>Religious beliefs and sex with men</td>
<td>My religious beliefs make me feel bad about having sex with other men.</td>
<td>838, 840 99%</td>
<td>1116, 1118 99%</td>
<td>1128, 1130 99%</td>
<td>1128, 1130 99%</td>
<td>1128, 1130 99%</td>
</tr>
<tr>
<td>Choose religious beliefs versus sex with man</td>
<td>I often have to choose my religious beliefs over my desire to be with a man.</td>
<td>838, 840 99%</td>
<td>1128, 1130 99%</td>
<td>1121, 1123 99%</td>
<td>1121, 1123 99%</td>
<td>1121, 1123 99%</td>
</tr>
<tr>
<td>Total Religiosity Index</td>
<td></td>
<td>1123, 1125 99%</td>
<td>1135, 1137 99%</td>
<td>1135, 1137 99%</td>
<td>1135, 1137 99%</td>
<td>1135, 1137 99%</td>
</tr>
</tbody>
</table>

1-Bolded values represent statistically significant relationships (i.e. p-values <0.05)
2-Bold and ** indicates marginally statistically significance (p-value <0.07)
Table 3.6. Chi-square and p-values of spirituality associated with depression and substance use variables

<table>
<thead>
<tr>
<th>Question Header</th>
<th>Question</th>
<th>Risk Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(df, N %, p-value)</td>
</tr>
<tr>
<td></td>
<td>Depression (last 30 days)</td>
<td>Depression (within last week)</td>
</tr>
<tr>
<td>Guidance from Higher Power</td>
<td>I always seek guidance from a higher power in times of need.</td>
<td>1133,1135 99% 1133,1135 99%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.5523 0.6444 0.0604 &lt;0.0001</td>
</tr>
<tr>
<td>Spiritual Connection</td>
<td>My spiritual connection with a higher power helps me cope with negative beliefs that other people have about homosexuality.</td>
<td>1072,1074 99% 1072,1074 99%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.3791 0.7474 0.0038 0.1923</td>
</tr>
<tr>
<td>Spirituality and health</td>
<td>My spiritual beliefs encourage me to do everything I can to stay healthy.</td>
<td>1130,1132 99% 1130,1132 99%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.9779 0.6679 0.0134 0.3080</td>
</tr>
<tr>
<td>Total spirituality index</td>
<td></td>
<td>1134,1136 99% 1134,1136 99%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.8463 0.6302 0.0093 0.2901</td>
</tr>
</tbody>
</table>

1-Bolded values represent statistically significant relationships (i.e. p-values <0.05)
2-Bold and ** indicates marginally statistically significance (p-value <0.07)
<table>
<thead>
<tr>
<th>Variable</th>
<th>Estimate</th>
<th>Standard Error</th>
<th>p-values</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression*Non-prescription substance use</td>
<td>0.137</td>
<td>0.063</td>
<td>0.0298</td>
<td>(0.01, 0.26)</td>
</tr>
<tr>
<td>Crack Use</td>
<td>1.214</td>
<td>0.422</td>
<td>0.0041</td>
<td>(0.39, 2.04)</td>
</tr>
<tr>
<td>Cocaine Use</td>
<td>0.909</td>
<td>0.447</td>
<td>0.0423</td>
<td>(-2.20, -1.25)</td>
</tr>
<tr>
<td>Non-prescription substance abuse</td>
<td>-0.412</td>
<td>0.029</td>
<td>0.0487</td>
<td>(-0.82, 0.02)</td>
</tr>
</tbody>
</table>
Table 3.8 Parameter Estimates of Model Association Relative to Substance Abuse and Depression$^1$

<table>
<thead>
<tr>
<th></th>
<th>Model A</th>
</tr>
</thead>
<tbody>
<tr>
<td>R squared Adjusted$^3$</td>
<td>0.02</td>
</tr>
<tr>
<td>Max R squared</td>
<td>0.075</td>
</tr>
<tr>
<td></td>
<td>0.131</td>
</tr>
<tr>
<td>Depression*Non-prescription substance use</td>
<td>(0.008, 0.254)</td>
</tr>
<tr>
<td></td>
<td>0.0360</td>
</tr>
<tr>
<td></td>
<td>1.322</td>
</tr>
<tr>
<td>Crack Use</td>
<td>(0.541, 2.104)</td>
</tr>
<tr>
<td></td>
<td>0.0009</td>
</tr>
<tr>
<td></td>
<td>1.045</td>
</tr>
<tr>
<td>Cocaine Use</td>
<td>(0.215, 1.875)</td>
</tr>
<tr>
<td></td>
<td>0.0137</td>
</tr>
<tr>
<td></td>
<td>0.0279</td>
</tr>
<tr>
<td>Non-prescription substance abuse</td>
<td>(0.083, 0.475)</td>
</tr>
<tr>
<td></td>
<td>0.0053</td>
</tr>
</tbody>
</table>

1 – Data are shown as beta coefficients, 95% profile confidence intervals, p-values
2 – Lower AICC values indicate a better fitting model
3 – Higher R-Squared Adjusted statistic indicates better predictability of model.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Estimate</th>
<th>Standard Error</th>
<th>p-values</th>
<th>95% Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression*Non-prescription substance use</td>
<td>0.032</td>
<td>0.044</td>
<td>0.473</td>
<td>(-0.055, 0.119)</td>
</tr>
<tr>
<td>Crack Use</td>
<td>-0.411</td>
<td>0.273</td>
<td>0.1315</td>
<td>(-0.947, 0.124)</td>
</tr>
<tr>
<td>Alcohol Use</td>
<td>-0.433</td>
<td>0.209</td>
<td>0.0384</td>
<td>(-0.844, -0.023)</td>
</tr>
<tr>
<td>Non-prescription substance abuse</td>
<td>0.062</td>
<td>0.106</td>
<td>0.5635</td>
<td>(-0.148, 0.271)</td>
</tr>
</tbody>
</table>
APPENDIX A

IRB APPROVAL
DATE: March 6, 2012

MEMORANDUM

TO: Tommie Watkins  
Principal Investigator

FROM: Cari Oliver  
Assistant Director, UAB OIRB

RE: Request for Determination—Human Subjects Research
IRB Protocol #N120215003 – Dissertation Project - Association of Religiosity and Spirituality and HIV Risk Behavior Among MSM

A member of the Office of the IRB has reviewed your application for Designation of Not Human Subjects Research for above referenced proposal.

The reviewer has determined that this proposal is not subject to FDA regulations and is not Human Subjects Research. Note that any changes to the project should be resubmitted to the Office of the IRB for determination.
APPENDIX B

DATA TABLES
For this study sexual risk was assessed using the following:

**Condom use history**- (SA 39-AUSEX_WC 1152 responses, 2 missing).

**SA39. In the past 3 months, did you have anal sex without a condom with any casual male sex partners?**

**AUSEX_WC**

In the past 3 months, did you have anal sex without a condom with any casual male sex partners?

1 = Yes, only with one man  
2 = Yes, with more than one man  
3 = No  
8 = Refuse to Answer

<table>
<thead>
<tr>
<th>AUSEX_WC</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>252</td>
<td>21.88</td>
<td>252</td>
<td>21.88</td>
</tr>
<tr>
<td>2</td>
<td>132</td>
<td>11.46</td>
<td>384</td>
<td>33.33</td>
</tr>
<tr>
<td>3</td>
<td>768</td>
<td>66.67</td>
<td>1152</td>
<td>100.00</td>
</tr>
</tbody>
</table>

This variable was recoded dichotomously where M=missing, O=No, and 1= yes and frequencies presented below:

<table>
<thead>
<tr>
<th>AUSEX_WC_di</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>2</td>
<td>0.18</td>
<td>2</td>
<td>0.18</td>
</tr>
<tr>
<td>0</td>
<td>761</td>
<td>66.70</td>
<td>763</td>
<td>66.87</td>
</tr>
<tr>
<td>1</td>
<td>378</td>
<td>33.13</td>
<td>1141</td>
<td>100.00</td>
</tr>
</tbody>
</table>
Unprotected Anal Intercourse (UAI) With Non-Main Partner

(SA 26-IP_YB-RECEPTIVE ANAL INTERCOURSE; SA 21-IP_AB-INSERTIVE ANAL INTERCOURSE) [Yes/No]

SA 26-IP_YB-RECEPTIVE ANAL INTERCOURSE and SA 21-IP_AB-INSERTIVE ANAL INTERCOURSE were questions posed to participants that asked about unprotected insertive and receptive sex with a NON MAIN partner with in the past three months. 2=NO and cumulatively 563 responded NO and 590 responded YES (590+563=1153).

### SA 26-IP_YB-RECEPTIVE ANAL INTERCOURSE

<table>
<thead>
<tr>
<th>IP_YB</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>177</td>
<td>30.05</td>
<td>177</td>
<td>30.05</td>
</tr>
<tr>
<td>2</td>
<td>412</td>
<td>69.95</td>
<td>589</td>
<td>100.00</td>
</tr>
</tbody>
</table>

This variable was recoded dichotomously where M=missing, O=No, and 1= yes and frequencies presented below:

<table>
<thead>
<tr>
<th>IP_YB_di</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>558</td>
<td>48.90</td>
<td>558</td>
<td>48.90</td>
</tr>
<tr>
<td>0</td>
<td>408</td>
<td>35.76</td>
<td>966</td>
<td>84.66</td>
</tr>
<tr>
<td>1</td>
<td>175</td>
<td>15.34</td>
<td>1141</td>
<td>100.00</td>
</tr>
</tbody>
</table>

### SA 21-IP_AB-INSERTIVE ANAL INTERCOURSE

<table>
<thead>
<tr>
<th>IP_AB</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>290</td>
<td>49.24</td>
<td>290</td>
<td>49.24</td>
</tr>
<tr>
<td>2</td>
<td>299</td>
<td>50.76</td>
<td>589</td>
<td>100.00</td>
</tr>
</tbody>
</table>
This variable was recoded dichotomously where M=missing, O=No, and 1= yes and frequencies presented below:

<table>
<thead>
<tr>
<th>IP_AB_di</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>558</td>
<td>48.90</td>
<td>558</td>
<td>48.90</td>
</tr>
<tr>
<td>0</td>
<td>297</td>
<td>26.03</td>
<td>855</td>
<td>74.93</td>
</tr>
<tr>
<td>1</td>
<td>286</td>
<td>25.07</td>
<td>1141</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Sexual transmitted infection (STI)- Measured by (STD_1); STD_EVER, 1154 respondents and no missing responses. Plan to use as dichotomous (Yes/No).

**STD1. Have you ever had a sexually transmitted disease (STD)?**

**STD_EVER**

- 2 = No
- 1 = Yes
- 8 = Refuse to Answer

<table>
<thead>
<tr>
<th>STD_EVER</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>774</td>
<td>67.07</td>
<td>774</td>
<td>67.07</td>
</tr>
<tr>
<td>2</td>
<td>380</td>
<td>32.93</td>
<td>1154</td>
<td>100.00</td>
</tr>
</tbody>
</table>

This variable was recoded dichotomously where O=No, and 1= yes and frequencies presented below:

<table>
<thead>
<tr>
<th>STD_EVER_di</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>378</td>
<td>33.13</td>
<td>378</td>
<td>33.13</td>
</tr>
<tr>
<td>1</td>
<td>763</td>
<td>66.87</td>
<td>1141</td>
<td>100.00</td>
</tr>
</tbody>
</table>
4) HIV infection results from actual testing of participants

This variable was recoded dichotomously where M=missing, O=HIV-uninfected, and 1=HIV-infected and frequencies presented below:

<table>
<thead>
<tr>
<th>HIV_TEST_VAR</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>13</td>
<td>1.14</td>
<td>13</td>
<td>1.14</td>
</tr>
<tr>
<td>0</td>
<td>538</td>
<td>47.15</td>
<td>551</td>
<td>48.29</td>
</tr>
<tr>
<td>1</td>
<td>590</td>
<td>51.71</td>
<td>1141</td>
<td>100.00</td>
</tr>
</tbody>
</table>
OUTCOME VARIABLES

1) Depression-(GH4-DEPRESSION)

In the last 3 months, approximately how many days did you feel sad or depressed for most of the day?

GH4  Depression

1 = Never
2 = 1 - 2 days
3 = 3 - 6 days
4 = 7 - 10 days
5 = 11 - 20 days
6 = 21 - 30 days
7 = over 30 days
8 = Refuse to Answer

<table>
<thead>
<tr>
<th>GH4</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>182</td>
<td>15.80</td>
<td>182</td>
<td>15.80</td>
</tr>
<tr>
<td>2</td>
<td>390</td>
<td>33.85</td>
<td>572</td>
<td>49.65</td>
</tr>
<tr>
<td>3</td>
<td>266</td>
<td>23.09</td>
<td>838</td>
<td>72.74</td>
</tr>
<tr>
<td>4</td>
<td>149</td>
<td>12.93</td>
<td>987</td>
<td>85.68</td>
</tr>
<tr>
<td>5</td>
<td>73</td>
<td>6.34</td>
<td>1060</td>
<td>92.01</td>
</tr>
<tr>
<td>6</td>
<td>42</td>
<td>3.65</td>
<td>1102</td>
<td>95.66</td>
</tr>
<tr>
<td>7</td>
<td>50</td>
<td>4.34</td>
<td>1152</td>
<td>100.00</td>
</tr>
</tbody>
</table>
This variable was recoded categorically where M=missing, 1=“1-2 Days”, 2=“3-6 days”, and 3=“More than 6 days”.

<table>
<thead>
<tr>
<th>Depress_cat</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>2</td>
<td>0.18</td>
<td>2</td>
<td>0.18</td>
</tr>
<tr>
<td>0</td>
<td>179</td>
<td>15.69</td>
<td>181</td>
<td>15.86</td>
</tr>
<tr>
<td>1</td>
<td>387</td>
<td>33.92</td>
<td>568</td>
<td>49.78</td>
</tr>
<tr>
<td>2</td>
<td>265</td>
<td>23.23</td>
<td>833</td>
<td>73.01</td>
</tr>
<tr>
<td>3</td>
<td>308</td>
<td>26.99</td>
<td>1141</td>
<td>100.00</td>
</tr>
</tbody>
</table>

2) Substance use-(9-questions; SUB 1-9)-*Coded for frequency*

**SUB1** Did you use alcohol in the past 3 months?

<table>
<thead>
<tr>
<th>Alcohol</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>750</td>
<td>65.16</td>
<td>750</td>
<td>65.16</td>
</tr>
<tr>
<td>2</td>
<td>401</td>
<td>34.84</td>
<td>1151</td>
<td>100.00</td>
</tr>
</tbody>
</table>

This variable was recoded dichotomously where M=missing, O=No, and 1=Yes.

<table>
<thead>
<tr>
<th>Alcohol dichotomous</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>3</td>
<td>0.26</td>
<td>3</td>
<td>0.26</td>
</tr>
<tr>
<td>0</td>
<td>394</td>
<td>34.53</td>
<td>397</td>
<td>34.79</td>
</tr>
<tr>
<td>1</td>
<td>744</td>
<td>65.21</td>
<td>1141</td>
<td>100.00</td>
</tr>
</tbody>
</table>
During the past three months, how often did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?

1 = Daily  
2 = A few times a week  
3 = About once a week  
4 = 2-3 times a month  
5 = About once a month  
6 = Less than once a month  
7 = Not at all  
8 = Refuse to Answer

<table>
<thead>
<tr>
<th>&gt;5 drinks of alcohol</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>62</td>
<td>8.27</td>
<td>62</td>
<td>8.27</td>
</tr>
<tr>
<td>2</td>
<td>166</td>
<td>22.13</td>
<td>228</td>
<td>30.40</td>
</tr>
<tr>
<td>3</td>
<td>120</td>
<td>16.00</td>
<td>348</td>
<td>46.40</td>
</tr>
<tr>
<td>4</td>
<td>111</td>
<td>14.80</td>
<td>459</td>
<td>61.20</td>
</tr>
<tr>
<td>5</td>
<td>89</td>
<td>11.87</td>
<td>548</td>
<td>73.07</td>
</tr>
<tr>
<td>6</td>
<td>64</td>
<td>8.53</td>
<td>612</td>
<td>81.60</td>
</tr>
<tr>
<td>7</td>
<td>138</td>
<td>18.40</td>
<td>750</td>
<td>100.00</td>
</tr>
</tbody>
</table>

This variable was recoded as “5 OR MORE DRINKS OF ALCOHOL,” where 7=0=NONE. 1= “Daily,” 2-3= “Weekly,” 4-5= “Monthly,” and 6= “Less than once a month.”

<table>
<thead>
<tr>
<th>ALC_ge5</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing</td>
<td>397</td>
<td>34.79</td>
<td>397</td>
<td>34.79</td>
</tr>
<tr>
<td>None</td>
<td>137</td>
<td>12.01</td>
<td>534</td>
<td>46.80</td>
</tr>
<tr>
<td>Daily</td>
<td>60</td>
<td>5.26</td>
<td>594</td>
<td>52.06</td>
</tr>
<tr>
<td>Weekly</td>
<td>285</td>
<td>24.98</td>
<td>879</td>
<td>77.04</td>
</tr>
<tr>
<td>Monthly</td>
<td>199</td>
<td>17.44</td>
<td>1078</td>
<td>94.48</td>
</tr>
<tr>
<td>&lt;once a month</td>
<td>63</td>
<td>5.52</td>
<td>1141</td>
<td>100.00</td>
</tr>
</tbody>
</table>
**SUB3** Did you use Speed, Tina, Crystal Meth, or Ice in the past 3 months?

2 = No  
1 = Yes  
8 = Refuse to Answer

<table>
<thead>
<tr>
<th>Methamphetamine</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35</td>
<td>3.04</td>
<td>35</td>
<td>3.04</td>
</tr>
<tr>
<td>2</td>
<td>1115</td>
<td>96.96</td>
<td>1150</td>
<td>100.00</td>
</tr>
</tbody>
</table>

This variable was recoded dichotomously where M=missing, O=No, and 1=Yes.

<table>
<thead>
<tr>
<th>Methamphetamine</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>4</td>
<td>0.35</td>
<td>4</td>
<td>0.35</td>
</tr>
<tr>
<td>0</td>
<td>1102</td>
<td>96.58</td>
<td>1106</td>
<td>96.93</td>
</tr>
<tr>
<td>1</td>
<td>35</td>
<td>3.07</td>
<td>1141</td>
<td>100.00</td>
</tr>
</tbody>
</table>

**SUB4** Did you use cocaine alone (powder, blow, coke) in the past 3 months?

2 = No  
1 = Yes  
8 = Refuse to Answer

<table>
<thead>
<tr>
<th>Cocaine</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>371</td>
<td>32.23</td>
<td>371</td>
<td>32.23</td>
</tr>
<tr>
<td>2</td>
<td>780</td>
<td>67.77</td>
<td>1151</td>
<td>100.00</td>
</tr>
</tbody>
</table>
This variable was recoded dichotomously where M=missing, O=No, and 1=Yes.

<table>
<thead>
<tr>
<th>Cocaine</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>3</td>
<td>0.26</td>
<td>3</td>
<td>0.26</td>
</tr>
<tr>
<td>0</td>
<td>769</td>
<td>67.40</td>
<td>772</td>
<td>67.66</td>
</tr>
<tr>
<td>1</td>
<td>369</td>
<td>32.34</td>
<td>1141</td>
<td>100.00</td>
</tr>
</tbody>
</table>

**SUB5 Did you use crack (freebase/hubby) in the past 3 months?**

2  = No
1  = Yes
8  = Refuse to Answer

<table>
<thead>
<tr>
<th>Crack</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>384</td>
<td>33.33</td>
<td>384</td>
<td>33.33</td>
</tr>
<tr>
<td>2</td>
<td>768</td>
<td>66.67</td>
<td>1152</td>
<td>100.00</td>
</tr>
</tbody>
</table>

This variable was recoded dichotomously where M=missing, O=No, and 1=Yes.

<table>
<thead>
<tr>
<th>SUB5_di</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>2</td>
<td>0.18</td>
<td>2</td>
<td>0.18</td>
</tr>
<tr>
<td>0</td>
<td>757</td>
<td>66.35</td>
<td>759</td>
<td>66.52</td>
</tr>
<tr>
<td>1</td>
<td>382</td>
<td>33.48</td>
<td>1141</td>
<td>100.00</td>
</tr>
</tbody>
</table>
**SUB6** Did you use marijuana (pot, weed, hashish, grass, ganja) in the past 3 months?

2 = No
1 = Yes
8 = Refuse to Answer

<table>
<thead>
<tr>
<th>Did you use marijuana (pot, weed, hashish)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUB 6</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
</tbody>
</table>

This variable was recoded dichotomously where M=missing, O=No, and 1=Yes.

<table>
<thead>
<tr>
<th>SUB6_di</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>2</td>
<td>0.18</td>
<td>2</td>
<td>0.18</td>
</tr>
<tr>
<td>0</td>
<td>611</td>
<td>53.55</td>
<td>613</td>
<td>53.72</td>
</tr>
<tr>
<td>1</td>
<td>528</td>
<td>46.28</td>
<td>1141</td>
<td>100.00</td>
</tr>
</tbody>
</table>

**SUB7** Did you use heroin (smack, H, horse) in the past 3 months?

2 = No
1 = Yes
8 = Refuse to Answer

<table>
<thead>
<tr>
<th>Did you use heroin (smack, H, horse) in</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUB 7</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
</tbody>
</table>
This variable was recoded dichotomously where M=missing, O=No, and 1=Yes.

<table>
<thead>
<tr>
<th>SUB7_di</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>2</td>
<td>0.18</td>
<td>2</td>
<td>0.18</td>
</tr>
<tr>
<td>0</td>
<td>1098</td>
<td>96.23</td>
<td>1100</td>
<td>96.41</td>
</tr>
<tr>
<td>1</td>
<td>41</td>
<td>3.59</td>
<td>1141</td>
<td>100.00</td>
</tr>
</tbody>
</table>

**SUB8** Did you use poppers (rush, amyl nitrate) in the past 3 months?

2 = No
1 = Yes
8 = Refuse to Answer

<table>
<thead>
<tr>
<th>Did you use poppers (rush, amyl nitrate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUB8</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
</tbody>
</table>

This variable was recoded dichotomously where M=missing, O=No, and 1=Yes.

<table>
<thead>
<tr>
<th>SUB8_di</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>2</td>
<td>0.18</td>
<td>2</td>
<td>0.18</td>
</tr>
<tr>
<td>0</td>
<td>1013</td>
<td>88.78</td>
<td>1015</td>
<td>88.96</td>
</tr>
<tr>
<td>1</td>
<td>126</td>
<td>11.04</td>
<td>1141</td>
<td>100.00</td>
</tr>
</tbody>
</table>
SUB9 Did you use ecstasy, GHB, or special K (ketamine) in the past 3 months?

2  =  No
1  =  Yes
8  =  Refuse to Answer

<table>
<thead>
<tr>
<th>Did you use ecstasy, GHB, or special K (</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUB9</td>
<td>1</td>
<td>34</td>
<td>2.95</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1118</td>
<td>97.05</td>
<td>1152</td>
</tr>
</tbody>
</table>

This variable was recoded dichotomously where M=missing, O=No, and 1=Yes.

<table>
<thead>
<tr>
<th>SUB9_di</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>2</td>
<td>0.18</td>
<td>2</td>
<td>0.18</td>
</tr>
<tr>
<td>0</td>
<td>1105</td>
<td>96.84</td>
<td>1107</td>
<td>97.02</td>
</tr>
<tr>
<td>1</td>
<td>34</td>
<td>2.98</td>
<td>1141</td>
<td>100.00</td>
</tr>
</tbody>
</table>

A separate variable “NON PRESCRIPTION SUBSTANCE USE” was created that added SUB 3, SUB 4, SUB 5, SUB 6, SUB 7, SUB 8, AND SUB 9.

<table>
<thead>
<tr>
<th>NP_SUB_TOTAL: Non-prescription substance use total= sum of SUB3_di SUB4_di SUB5_di SUB6_di SUB7_di SUB8_di SUB9_di</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>NP_SUB_TOTAL</td>
<td>2</td>
<td>0.18</td>
<td>2</td>
<td>0.18</td>
</tr>
<tr>
<td>0</td>
<td>398</td>
<td>34.88</td>
<td>400</td>
<td>35.06</td>
</tr>
<tr>
<td>1</td>
<td>276</td>
<td>24.19</td>
<td>676</td>
<td>59.25</td>
</tr>
<tr>
<td>2</td>
<td>235</td>
<td>20.60</td>
<td>911</td>
<td>79.84</td>
</tr>
<tr>
<td>3</td>
<td>173</td>
<td>15.16</td>
<td>1084</td>
<td>95.00</td>
</tr>
<tr>
<td>4</td>
<td>39</td>
<td>3.42</td>
<td>1123</td>
<td>98.42</td>
</tr>
<tr>
<td>5</td>
<td>15</td>
<td>1.31</td>
<td>1138</td>
<td>99.74</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>0.18</td>
<td>1140</td>
<td>99.91</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>0.09</td>
<td>1141</td>
<td>100.00</td>
</tr>
</tbody>
</table>
3) Religiosity (4-questions; SPI 1-WORSHIP; SPI 3-5) [High/Med/Low] How often have you attended a place of worship (e.g., church, temple, mosque) during the past 6 months other than for a wedding or funeral?

**WORSHIP**

How often have you attended a place of worship (e.g., church, temple, mosque) during the past 6 months other than for a wedding or funeral?

1 = Never
2 = Once a week
3 = 2-3 times a month
4 = Once a month
5 = Less than once a month
8 = Refuse to Answer

<table>
<thead>
<tr>
<th>WORSHIP</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>284</td>
<td>24.74%</td>
<td>284</td>
<td>24.74%</td>
</tr>
<tr>
<td>2</td>
<td>254</td>
<td>22.13%</td>
<td>538</td>
<td>46.86%</td>
</tr>
<tr>
<td>3</td>
<td>229</td>
<td>19.95%</td>
<td>767</td>
<td>66.81%</td>
</tr>
<tr>
<td>4</td>
<td>126</td>
<td>10.98%</td>
<td>893</td>
<td>77.79%</td>
</tr>
<tr>
<td>5</td>
<td>255</td>
<td>22.21%</td>
<td>1148</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

This variable was recoded dichotomously where M=missing, O=No, and 1=Yes.
WORSHIP_di: Attended a place of worship? (1=some, 0=never)

<table>
<thead>
<tr>
<th>WORSHIP_di</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>5</td>
<td>0.44</td>
<td>5</td>
<td>0.44</td>
</tr>
<tr>
<td>0</td>
<td>281</td>
<td>24.63</td>
<td>286</td>
<td>25.07</td>
</tr>
<tr>
<td>1</td>
<td>855</td>
<td>74.93</td>
<td>1141</td>
<td>100.00</td>
</tr>
</tbody>
</table>

This variable was recoded WORSHIP="CHURCH ATTENDANCE" as 0= Never, 1=Some, 2=Monthly, 3=weekly,

CHURCH_ATTEND: [from WORSHIP] (0=never, 1=some, 2=monthly, 3=weekly)

<table>
<thead>
<tr>
<th>CHURCH_ATTEND</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>5</td>
<td>0.44</td>
<td>5</td>
<td>0.44</td>
</tr>
<tr>
<td>0</td>
<td>281</td>
<td>24.63</td>
<td>286</td>
<td>25.07</td>
</tr>
<tr>
<td>1</td>
<td>254</td>
<td>22.26</td>
<td>540</td>
<td>47.33</td>
</tr>
<tr>
<td>2</td>
<td>350</td>
<td>30.67</td>
<td>890</td>
<td>78.00</td>
</tr>
<tr>
<td>3</td>
<td>251</td>
<td>22.00</td>
<td>1141</td>
<td>100.00</td>
</tr>
</tbody>
</table>

A new variable was created as “WORSHIP CONTINUOUS” and coded as 1="0", 2="4", 3="3", 4="2", AND 5="1"

WORSHIP_CONT: 0=None -- 4=Weekly

<table>
<thead>
<tr>
<th>WORSHIP_CONT</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>5</td>
<td>0.44</td>
<td>5</td>
<td>0.44</td>
</tr>
<tr>
<td>0</td>
<td>281</td>
<td>24.63</td>
<td>286</td>
<td>25.07</td>
</tr>
<tr>
<td>1</td>
<td>254</td>
<td>22.26</td>
<td>540</td>
<td>47.33</td>
</tr>
<tr>
<td>2</td>
<td>126</td>
<td>11.04</td>
<td>666</td>
<td>58.37</td>
</tr>
<tr>
<td>3</td>
<td>224</td>
<td>19.63</td>
<td>890</td>
<td>78.00</td>
</tr>
<tr>
<td>4</td>
<td>251</td>
<td>22.00</td>
<td>1141</td>
<td>100.00</td>
</tr>
</tbody>
</table>
SPI3. I am able to be open about my sexuality in my religious community.

SPI3 I am able to be open about my sexuality in my religious community.

1 = Strongly agree
2 = Agree somewhat
3 = Disagree somewhat
4 = Strongly disagree
5 = I don't have a religious community
8 = Refuse to Answer

<table>
<thead>
<tr>
<th>I am able to be open about my sexuality</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>146</td>
<td>12.76</td>
<td>146</td>
<td>12.76</td>
</tr>
<tr>
<td>2</td>
<td>158</td>
<td>13.81</td>
<td>304</td>
<td>26.57</td>
</tr>
<tr>
<td>3</td>
<td>125</td>
<td>10.93</td>
<td>429</td>
<td>37.50</td>
</tr>
<tr>
<td>4</td>
<td>428</td>
<td>37.41</td>
<td>857</td>
<td>74.91</td>
</tr>
<tr>
<td>5</td>
<td>287</td>
<td>25.09</td>
<td>1144</td>
<td>100.00</td>
</tr>
</tbody>
</table>

DICHOTOMOUS SPI3=“RELIGIOUS OPENNES” WHERE THE NEW “3” + “4”= “NO”, AND “2” + “1”= “YES.”

<table>
<thead>
<tr>
<th>SPI3_CONT</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>10</td>
<td>0.88</td>
<td>10</td>
<td>0.88</td>
</tr>
<tr>
<td>0</td>
<td>283</td>
<td>24.80</td>
<td>293</td>
<td>25.68</td>
</tr>
<tr>
<td>1</td>
<td>144</td>
<td>12.62</td>
<td>437</td>
<td>38.30</td>
</tr>
<tr>
<td>2</td>
<td>157</td>
<td>13.76</td>
<td>594</td>
<td>52.06</td>
</tr>
<tr>
<td>3</td>
<td>124</td>
<td>10.87</td>
<td>718</td>
<td>62.93</td>
</tr>
<tr>
<td>4</td>
<td>423</td>
<td>37.07</td>
<td>1141</td>
<td>100.00</td>
</tr>
</tbody>
</table>

RELIG_OPEN: [from SP4] (0=NO, 1=YES)

<table>
<thead>
<tr>
<th>RELIG_OPEN</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>293</td>
<td>25.68</td>
<td>293</td>
<td>25.68</td>
</tr>
<tr>
<td>0</td>
<td>547</td>
<td>47.94</td>
<td>840</td>
<td>73.62</td>
</tr>
<tr>
<td>1</td>
<td>301</td>
<td>26.38</td>
<td>1141</td>
<td>100.00</td>
</tr>
</tbody>
</table>
**SPI4.** My religious beliefs make me feel bad about having sex with other men.

**SPI4**

My religious beliefs make me feel bad about having sex with other men.

1 = Strongly agree
2 = Agree somewhat
3 = Disagree somewhat
4 = Strongly disagree
5 = I don't have religious beliefs
8 = Refuse to Answer

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This variable was recoded where M=missing, 0=No religious beliefs, 1=Strongly Disagree, 3=Disagree somewhat, 2=Agree somewhat, and 1=Strongly agree

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**SPI5.** I often have to choose my religious beliefs over my desire to be with a man.

SPI5 I often have to choose my religious beliefs over my desire to be with a man.

1 = Strongly agree
2 = Agree somewhat
3 = Disagree somewhat
4 = Strongly disagree
5 = I don't have religious beliefs
8 = Refuse to Answer

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This variable was recoded where M=missing, 0=No religious beliefs, 1=Strongly Disagree, 3=Disagree somewhat, 2=Agree somewhat, and 1=Strongly agree.

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SPI6. I always seek guidance from a higher power in times of need.

This variable was recoded where M=missing, 0=No religious beliefs, 1=Strongly Disagree, 3=Disagree somewhat, 2=Agree somewhat, and 1=Strongly agree.
SPI7. My spiritual connection with a higher power helps me cope with negative beliefs that other people have about homosexuality.

SPI7 My spiritual connection with a higher power helps me cope with negative beliefs that other people have about homosexuality.

1 = Strongly agree
2 = Agree somewhat
3 = Disagree somewhat
4 = Strongly disagree
5 = I don't have any spiritual connection
8 = Refuse to Answer

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SPI8. My spiritual beliefs encourage me to do everything that I can to stay healthy.

My spiritual beliefs encourage me to do everything that I can to stay healthy.

1 = Strongly agree  
2 = Agree somewhat  
3 = Disagree somewhat  
4 = Strongly disagree  
5 = I don't have any spiritual beliefs  
8 = Refuse to Answer

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A new variable “SPIRITUALITY” was created as a sum of the continuous variables: SPI6+SPI7+SPI8.

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### Pearson Correlation Coefficients

**Prob > |r| under H0: Rho=0**  
**Number of Observations**

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Pearson Correlation Coefficients
Prob > |r| under H0: Rho=0
Number of Observations
APPENDIX C

SAS CODING
Note: Billy provided Tommie with the primary coding used to create variables used across ByH analyses. Gary originally provided Billy with these in 2010. This program should be sufficient to get Tommie started with his dissertation analyses.

This code has been modified by M. Scott Crawford on behalf of Tommie for his dissertation.

Date: 9/10/2012

*SCOTT*;
libname RAW "E:\Research Data\RAW SAS DATASETS";
libname DisData 'E:\Research Data\NEW SAS DATASETS';

Data Disdata.ALL_DATA; set RAW.byhiv_nyblk RAW.byhiv_phil RAW.byhiv_la RAW.byhiv_nylat;

********CONSTRUCTING VARIABLES (OTHER THAN THE SEX ITEMS) FOR THE ANALYSIS********;

****NOTE THAT THE THE RESPONSE OF 94 WAS OMITTED;

IF SITEID=1 OR SITEID=4 THEN ETHNICGRP=1; *LATINOS;
IF SITEID=2 OR SITEID=3 THEN ETHNICGRP=2; *BLACKS;

*THIS CREATES A 2-GROUP SITE VARIABLE FOR BLACKS;
IF SITEID = 2 THEN BLACKSITE=1;*PHILLY;
IF SITEID = 3 THEN BLACKSITE=2;*NYC;

IF 18<=AGE<=25 THEN AGEGROUP=1;
IF 26<=AGE<=35 THEN AGEGROUP=2;
IF 36<=AGE<=45 THEN AGEGROUP=3;
IF 46<=AGE<=71 THEN AGEGROUP=4;

*ALTERNATIVE AGE GROUPING;
IF 18<=AGE<=29 THEN AGEGROUP2=1;
IF 30<=AGE<=39 THEN AGEGROUP2=2;
IF 40<=AGE<=71 THEN AGEGROUP2=3;

*ADRIAN'S NEW TWO-GROUP AGE VARIABLE;
IF 18<AGE<=39 THEN AGEADRIAN=1;
IF 40<AGE<=71 THEN AGEADRIAN=2;

IF EDUC_LEV = 1 THEN EDUCATION = 1; *LESS THAN H.S.;
IF EDUC_LEV = 2 THEN EDUCATION = 2; *H.S. GRAD;
IF EDUC_LEV = 3 OR EDUC_LEV = 4 THEN EDUCATION = 3; *TECH GRAD OR AA DEGREE;
IF 5<=EDUC_LEV<=7 THEN EDUCATION = 3; *BA OR HIGHER;

IF 3<=DEM16<=5 THEN EMPLOY = 0; *NOT WORKING;
IF DEM16 = 2 THEN EMPLOY = 1; *WORKING PART TIME;
IF DEM16 = 1 THEN EMPLOY = 1; *WORKING FULL TIME;

IF DEM17 = 1 OR DEM17 = 2 THEN STUDENT = 1;
IF DEM17 = 3 THEN STUDENT = 0;

IF GH2 = 1 THEN HAVEDOC = 1;
IF GH2 = 2 THEN HAVEDOC = 0;

IF DEM18 = 1 THEN INCOME = 1; *LESS THAN 5k;
IF DEM18 = 2 THEN INCOME = 2; *5k TO 9999K;
IF DEM18 = 3 THEN INCOME = 3; *10K TO 19999K;
IF 4<=DEM18<=10 THEN INCOME = 4; *20000K OR HIGHER;

***THIS CREATES THE SEXUAL ORIENTATION VARIABLE;
IF DEM23 = 2 THEN SEXORIENT = 0; *GAY; *REFERENT GROUP;
IF DEM23 = 1 THEN SEXORIENT = 1; *HETERO;
IF DEM23 = 3 THEN SEXORIENT = 2; *BISEXUAL;
IF DEM23 = 4 THEN SEXORIENT = 3; *OTHER;

**INCARCERATION;
IF DEM21 = 1 THEN JAILED = 0;
IF DEM21 > 1 THEN JAILED = 1;

IF PBIRTH = 2 THEN BORNUS = 0; *BORN OUTSIDE OF US;
IF PBIRTH = 1 THEN BORNUS = 1; *BORN IN US;

**THESE VARIABLES ARE FOR CONSTRUCTING AN LANGUAGE ACCULTURATION SCALE
FOR ONLY
THE HISPANICS**;
IF SITEID = 1 OR SITEID = 4 THEN DO;
LANGREAD = DEM9;
LANGCHILD = VDEM10;
LANGHOME=DEM11;
LANGTHINK=DEM12;
END;

IF LANGREAD=.R THEN LANGREAD = .;
IF LANGCHILD=.R THEN LANGCHILD = .;
IF LANGHOME=.R THEN LANGHOME = .;
IF LANGTHINK=.R THEN LANGTHINK = .;

IF SITEID=1 OR SITEID=4 THEN DO;
LANGFRNDLA=DEM13LA;
LANGFRNDNY=DEM13NYC;
END;

IF LANGFRNDLA=.R THEN LANGFRNDLA = .;
IF LANGFRNDNY=.R THEN LANGFRNDNY = .;

**THE OPERATIONS BELOW COMBINE THE THE LANGUAGE WITH FRIENDS VARIABLES FOR THE TWO LATINO SITES***;

IF SITEID=1 THEN DO;
LANGFRND = LANGFRNDLA;
END;

IF SITEID=4 THEN DO;
LANGFRND = LANGFRNDNY;
END;

**FORMING A LANGUAGE ACCULTURATION SCALE BELOW FOR THE TWO LATINO SITES***;

LANGACCULT=MEAN(OF LANGREAD LANGTHINK LANGCHILD LANGHOME LANGFRND);

****THIS GROUPS THE LANGACCULT VARIABLE INTO THREE GROUPS CORRESPONDING TO ONLY OR MOSTLY SPANISH, ENGLISH AND SPANISH EQUALLY, ONLY OR MOST ENGLISH;

IF 1<=LANGACCULT<=2 THEN ACCULTGROUP=1; *ONLY/MOSTLY SPANISH;
IF 2<LANGACCULT<4 THEN ACCULTGROUP=2; *ENGLISH AND SPANISH ABOUT EQUALLY;
IF 4<=LANGACCULT<=5 THEN ACCULTGROUP=3; *ONLY/MOSTLY ENGLISH;

**CREATING ALCOHOL USE VARIABLE (3 GROUPS);**

IF SUB1=2 THEN ALCGROUP=0; *NO ALC USE;
IF SUB2=7 THEN ALCGROUP=1; *ALC USE BUT NO BINGING;
IF 4<=SUB2<=6 THEN ALCGROUP=2; *SOME BINGING;
IF 1<=SUB2<=3 THEN ALCGROUP=3; *HEAVY BINGING;
**POPPER VARIABLE***************;

IF SUB8=1 THEN POPPERS=1;
IF SUB8=2 THEN POPPERS=0;

ARRAY A SUB3 SUB4 SUB5 SUB6 SUB7 SUB9;
DO OVER A;
IF A=.R THEN A=.;
IF A=2 THEN A=0;
END;

***THIS CREATES A SUM SCORE FOR THE PRECEDING 6 DRUG VARIABLES IN THE ARRAY STATEMENT AND CREATES A THREE-GROUP DRUG VARIABLE OMITTED POT;

DRUGSUM=SUM(OF SUB3 SUB4 SUB5 SUB7 SUB9);

IF DRUGSUM=0 THEN DRUGGROUP=0; *NO DRUG USE NOT CONSIDERING ALC OR POPPERS;
IF DRUGSUM=1 THEN DRUGGROUP=1; *USED 1 DRUG NOT CONSIDERING ALC OR POPPERS;
IF DRUGSUM=>2 THEN DRUGGROUP=2; *USED 2 OR MORE DRUGS NOT CONSIDERING ALC OR POPPERS;

*Billy recoded DRUGGROUP on 12/01/2010 to make it similar to his variables, coded as 1,2,3;
IF DRUGSUM = 0 THEN ILLICITDRUG1 = 0;
ELSE IF DRUGSUM = 1 THEN ILLICITDRUG1 = 1;
ELSE IF DRUGSUM GE 2 THEN ILLICITDRUG1 = 2;
ELSE IF DRUGSUM IN (.R, .) THEN ILLICITDRUG1 = .;

IF DRUGSUM = 0 THEN ILLICITDRUG2 = 0;
ELSE IF DRUGSUM IN (1,2) THEN ILLICITDRUG2 = 1;
ELSE IF DRUGSUM GE 3 THEN ILLICITDRUG2 = 2;
ELSE IF DRUGSUM IN (.R, .) THEN ILLICITDRUG2 = .;

*Use ILLICITDRUG1 because only 48 guys are in the high category (3+ drugs) for ILLICITDRUG2;

*HIV TESTING VARIABLE;
IF HIV_TEST=2 THEN HIVTESTGROUP=0; *NEVER TESTED FOR HIV;
IF HT2=1 OR HT2=2 THEN HIVTESTGROUP=1; *TESTED 1 OR 2;
IF HT2=3 OR HT2=4 OR HT2=5 THEN HIVTESTGROUP=2; *TESTED 3-5;
IF HT2>5 THEN HIVTESTGROUP=3; *TESTED 6+;

*ALTERNATIVE HIV TESTING VARIABLE;
IF HIV_TEST=2 THEN HIVTESTGROUP2=0; *NEVER TESTED FOR HIV;
IF HT2=1 THEN HIVTESTGROUP2=1; *TESTED 1;
IF HT2=2 THEN HIVTESTGROUP2=2; *TESTED 2;
IF HT2>2 THEN HIVTESTGROUP2=3; *TESTED 3+;
***NUMBER OF FRIENDS VARIABLE;
 IF SITEID=1 THEN DO;
  NUMFRIENDS = NAQ1LLA;
 END;

 IF SITEID=2 THEN DO;
  NUMFRIENDS = NAQ1PHIL;
 END;

 IF SITEID=3 THEN DO;
  NUMFRIENDS = NAQ1BNYC;
 END;

 IF SITEID=4 THEN DO;
  NUMFRIENDS = NAQ1LNYC;
 END;

 ***CREATING VARIABLE ON FEELING PART OF GAY COMMUNITY***;

 IF SITEID=1 THEN DO;
  PARTOFGAYCOM = CAA2LLA;
 END;

 IF SITEID=2 THEN DO;
  PARTOFGAYCOM = CAA2BP;
 END;

 IF SITEID=3 THEN DO;
  PARTOFGAYCOM = CAA2BNYC;
 END;

 IF SITEID=4 THEN DO;
  PARTOFGAYCOM = CAA2LNYC;
 END;

 ***CREATING A 3-GROUP VARIABLE FOR NUMFRIENDS;***

 IF 0<=NUMFRIENDS<=5 THEN NUMFRIENDSGRP=1;
 IF 6<=NUMFRIENDS<=20 THEN NUMFRIENDSGRP=2;
 IF NUMFRIENDS>20 THEN NUMFRIENDSGRP=3;

 ****FRIENDS THINK IT IS IMPORTANT TO WEAR CONDOM;

 IF SA3=1 THEN CONDOMIMPORT=1; *VERY IMPORTANT;  
 IF SA3>1 THEN CONDOMIMPORT=0; *LESS THAN VERY IMPORTANT;
*CREATING 3-GROUP VARIABLE FOR THE HT8 VARIABLE ON LIKELY TO BE INFECTED***;

IF 0<=HT8<=2 THEN LIKELYINFECTED=0;
IF 3<=HT8<=6 THEN LIKELYINFECTED=1;
IF 7<=HT8<=10 THEN LIKELYINFECTED=2;

***************THESE COMMANDS ARE DELETING PARTICIPANTS WHO REFUSE TO ANSWER ON THE KEY SEX ITEMS FOR NON-MAIN PARTNERS SO NUMBERS OF PARTNERS WILL ADD UP. THESE DON’T HAVE TO BE DELETED IN THE REGRESSION ANALYSIS OF PREVALENCE***************;

/*IF AI_WAM=.R OR AI_WM=. THEN DELETE;
 IF OMPYPBWC=.R OR OMPYPBWC=. THEN DELETE;
 IF OMPYPBWC=.R OR OMPYPBWC=. THEN DELETE;
 IF IP_AB=.R OR IP_AB=. THEN DELETE;
 IF IP_YB=.R OR IP_YB=. THEN DELETE;
 IF SA23=.R OR SA23=. THEN DELETE;
 IF SA24=.R OR SA24=. THEN DELETE;
 IF SA25=.R OR SA25=. THEN DELETE;
 IF SA28=.R OR SA28=. THEN DELETE;
 IF SA29=.R OR SA29=. THEN DELETE;
 IF SA30=.R OR SA30=. THEN DELETE;*/

***THIS IS DELETING FROM THE ANALYSIS 18 MEN WHOSE HIV TEST RESULT WAS INDETERMINANT;
*IF HIV_RES=4 THEN DELETE;
***THIS CREATES THREE SEROSTATUS GROUPS FOR THE PARTICIPANTS;
IF HIV_TEST=2 THEN
  SEROSTATUS=0;

*NEVER TESTED BEFORE TODAY;
IF HIV_RES=3 THEN
  SEROSTATUS=0;

*DID NOT GET RESULTS OF LAST TEST;
IF HIV_RES=1 THEN
  SEROSTATUS=1;

*SELF REPORTED LAST TEST WAS HIV-NEG;
IF HIV_RES=2 THEN
  SEROSTATUS=2;

*SELF REPORTED LAST TEST WAS HIV-POS;
SELFREPORTNEGATIVE = SEROSTATUS;

IF SEROSTATUS IN (0,1) THEN
  SELFREPORTNEGATIVE = 1;
ELSE IF SEROSTATUS = 2 THEN
SELFREPORTNEGATIVE = 0;

**THIS ADDS THE INDETERMINATE GROUP AS PART OF UNRECOGNIZED INFECTION;

*THIS WAS NOT USED
IN THE MAIN ANALYSIS, THE INDETERMINANTS WERE OMITTED;

*IF HIV_RES=4 THEN SEROSTATUS=0;
*LAST TEST INDETERMINANT;

***FOR HIV+ PARTICIPANTS: CURRENTLY ON ARV DEFINED AS TAKING ARV
WITHIN THE LAST
3 MONTHS;
IF LASTARV=1 THEN
ONARV=1;

*YES WITHIN LAST THREE MONTHS;
IF LASTARV=.S THEN
ONARV=0;

IF 2<=LASTARV<=4 THEN
ONARV=0;

IF LASTARV=.R OR LASTARV=. THEN
ONARV=.;

****THIS CREATES LENGTH OF TIME HIV+ REPRESENTED IN NUMBER OF DAYS
BETWEEN PARTICIPATION
DATE AND DATE TESTED HIV+;
HIVDIAGDATE=PARTDATE-HT7C;

IF 2<=HIVDIAGDATE<=1828 THEN
HIVDIAGGRP=1;

*UP TO 5 YEARS;
IF 1832<=HIVDIAGDATE<=3647 THEN
HIVDIAGGRP=2;

*6-10 YEARS;
IF HIVDIAGDATE>=3667 THEN
HIVDIAGGRP=3;

*OVER 10 YEARS;

***CREATES DATE FOR LENGTH OF TIME SINCE LAST HIV TEST*******;
TIMELASTTEST=PARTDATE-HT4C;

IF -43<=TIMELASTTEST<=183 THEN
TESTTIMEGRP=1;

*TESTED LESS THAN 6 MONTHS BEFORE STUDY ENTRY;
IF 184<=TIMELASTTEST<=365 THEN
TESTTIMEGRP=2;
*TESTED 6-12 MONTHS BEFORE STUDY ENTRY;
IF 365<TIMELASTTEST<=730 THEN
TESTTIMEGRP=3;

*TESTED 12-24 MONTHS BEFORE STUDY ENTRY;
IF 730<TIMELASTTEST<=1095 THEN
TESTTIMEGRP=4;

*TESTED 24-36 MONTHS BEFORE STUDY ENTRY;
IF 1095<TIMELASTTEST<=7216 THEN
TESTTIMEGRP=5;

* TESTED OVER 3 YEARS BEFORE STUDY;
****PERCENT WHO HAD A MAIN PARTNER;
IF CR3MOMAN=1 OR CR3MOMAN=2 THEN
MAINPARTNER=1;
IF CR3MOMAN=3 THEN
MAINPARTNER=0;

****MAIN PARTNER HIV SEROSTATUS;
IF HIVSTATL=1 THEN
HIVSTAT_MAIN=2;

*THIS IS A POSITIVE MAIN PARTNER;
IF HIVSTATL=2 THEN
HIVSTAT_MAIN=1;

*THIS IS A NEGATIVE MAIN PARTNER;
IF HIVSTATL=3 THEN
HIVSTAT_MAIN=0;

*THIS IS A UNKNOWN MAIN PARTNER;
*********************************************************************;
****STUFF BELOW IS FOR MAIN PARTNERS******************************;
*********************************************************************;
****HAD MAIN PARTNER;
IF CR3MOMAN=1 OR CR3MOMAN=2 THEN
DO;
   *INDICATES THAT PARTICIPANT HAD A COMMITTED PARTNER;
   IF ANAL_3MO=1 OR CR_REC=1 THEN
      ANALMAIN=1;
   IF ANAL_3MO=2 AND CR_REC=2 THEN
      ANALMAIN=0;
END;
IF CR3MOMAN=3 THEN
ANALMAIN=0;
****MAIN PARTNERS: PERCENT UNPROTECTED INSERTIVE ANAL INTERCOURSE, UNPROTECTED RECEPTIVE ANAL INTERCOURSE, AND UNPROTECTED ANAL INTERCOURSE IN GENERAL*****;

*MAIN PARTNER, UNPROTECTED INSERTIVE;
IF ANALMAIN = 1 OR ANALMAIN=0 THEN
  DO;
    IF 2<=CR_CUSE<=5 THEN
      INSERTIVE_UA_MAIN = 1;
    IF CR_CUSE=1 THEN
      INSERTIVE_UA_MAIN=0;
    IF CR_CUSE=.S THEN
      INSERTIVE_UA_MAIN=0;
    IF CR_CUSE=.R THEN
      INSERTIVE_UA_MAIN=.
    IF CR_CUSE=. THEN
      INSERTIVE_UA_MAIN=.
  END;

*MAIN PARTNER, UNPROTECTED RECEPTIVE;
IF ANALMAIN = 1 OR ANALMAIN=0 THEN
  DO;
    IF 2<=CRECUSE<=5 THEN
      RECEPTIVE_UA_MAIN = 1;
    IF CRECUSE=1 THEN
      RECEPTIVE_UA_MAIN=0;
    IF CRECUSE=.S THEN
      RECEPTIVE_UA_MAIN=0;
    IF CRECUSE=.R THEN
      RECEPTIVE_UA_MAIN=.
    IF CRECUSE=. THEN
      RECEPTIVE_UA_MAIN=.
  END;

***MAIN PARTNER  THIS COMBINES THE UNPROTECTED INSERTIVE AND UNPROTECTED RECEPTIVE;
IF INSERTIVE_UA_MAIN =1 OR RECEPTIVE_UA_MAIN=1 THEN
  ANY_UA_MAIN=1;

IF INSERTIVE_UA_MAIN =0 AND RECEPTIVE_UA_MAIN=0 THEN
  ANY_UA_MAIN=0;

IF INSERTIVE_UA_MAIN=. AND RECEPTIVE_UA_MAIN=0 THEN
  ANY_UA_MAIN=0;
IF INSERTIVE_UA_MAIN=0 AND RECEPTIVE_UA_MAIN=0 THEN
    ANY_UA_MAIN=0;

IF INSERTIVE_UA_MAIN=0 AND RECEPTIVE_UA_MAIN=0 THEN
    ANY_UA_MAIN=0;

****THIS CREATES UNPROTECTED ANAL WITH AT-RISK PARTNERS TO BE USED FOR HIV-POSITIVE PARTICIPANTS;

**THIS CODE IS FOR MAIN PARTNERS;
IF SEROSTATUS=2 THEN
    DO;
        IF INSERTIVE_UA_MAIN=1 AND (HIVSTAT_MAIN=0 OR HIVSTAT_MAIN=1) THEN
            UA_ATRISKMAIN=1;
        IF RECEPTIVE_UA_MAIN=1 AND (HIVSTAT_MAIN=0 OR HIVSTAT_MAIN=1) THEN
            UA_ATRISKMAIN=1;
        IF INSERTIVE_UA_MAIN=1 AND HIVSTAT_MAIN=2 THEN
            UA_ATRISKMAIN=0;
        IF RECEPTIVE_UA_MAIN=1 AND HIVSTAT_MAIN=2 THEN
            UA_ATRISKMAIN=0;
        IF INSERTIVE_UA_MAIN=0 AND RECEPTIVE_UA_MAIN=0 THEN
            UA_ATRISKMAIN=0;
    END;

*****************************************************;
*STUFF BELOW IS FOR NON-MAIN PARTNERS***********;
*****************************************************;
*HAD ANY NON-MAIN PARTNERS;
*THE CODING BELOW IS VERY SPECIFIC TO OMIT THE DELETED BECAUSE OF THE SKIP PATTERN OF QUESTIONS;
IF AI_WAM = . AND AI_WM = . THEN
    ANALCASUAL=.

IF AI_WAM = .R AND AI_WM = .R THEN
    ANALCASUAL=.

IF AI_WAM = .S AND AI_WM = .R THEN
    ANALCASUAL=.

IF AI_WAM = .S AND AI_WM = 2 THEN
    ANALCASUAL=0;

IF AI_WAM=2 AND (AI_WM=. OR AI_WM=.S) THEN
    ANALCASUAL=0;
IF \( \text{AI\_WAM} = 1 \) OR \( \text{AI\_WM} = 1 \) THEN
\( \text{ANALCASUAL} = 1 \);

****\text{CASUAL PARTNER, UNPROTECTED INSERTIVE};
IF \( \text{IP}\_\text{AB} = . \) THEN
\( \text{INSERTIVE}\_\text{UA}\_\text{CASUAL} = . \);
IF \( \text{IP}\_\text{AB} = .R \) THEN
\( \text{INSERTIVE}\_\text{UA}\_\text{CASUAL} = . \);
IF \( \text{IP}\_\text{AB} = .S \) THEN
\( \text{INSERTIVE}\_\text{UA}\_\text{CASUAL} = 0 \);
IF \( \text{IP}\_\text{AB} = 2 \) THEN
\( \text{INSERTIVE}\_\text{UA}\_\text{CASUAL} = 0 \);
IF \( \text{IP}\_\text{AB} = 1 \) THEN
\( \text{INSERTIVE}\_\text{UA}\_\text{CASUAL} = 1 \);

****\text{CASUAL PARTNER, UNPROTECTED RECEPTIVE};
IF \( \text{IP}\_\text{YB} = . \) THEN
\( \text{RECEPTIVE}\_\text{UA}\_\text{CASUAL} = . \);
IF \( \text{IP}\_\text{YB} = .R \) THEN
\( \text{RECEPTIVE}\_\text{UA}\_\text{CASUAL} = . \);
IF \( \text{IP}\_\text{YB} = .S \) THEN
\( \text{RECEPTIVE}\_\text{UA}\_\text{CASUAL} = 0 \);
IF \( \text{IP}\_\text{YB} = 2 \) THEN
\( \text{RECEPTIVE}\_\text{UA}\_\text{CASUAL} = 0 \);
IF \( \text{IP}\_\text{YB} = 1 \) THEN
\( \text{RECEPTIVE}\_\text{UA}\_\text{CASUAL} = 1 \);

***\text{THIS COMBINES THE UNPROTECTED INSERTIVE AND UNPROTECTED RECEPTIVE FOR NON-MAIN PARTNER};
IF \( \text{INSERTIVE}\_\text{UA}\_\text{CASUAL} = 1 \) OR \( \text{RECEPTIVE}\_\text{UA}\_\text{CASUAL} = 1 \) THEN
\( \text{ANY}\_\text{UA}\_\text{CASUAL} = 1 \);
IF \( \text{INSERTIVE}\_\text{UA}\_\text{CASUAL} = 0 \) AND \( \text{RECEPTIVE}\_\text{UA}\_\text{CASUAL} = 0 \) THEN
\( \text{ANY}\_\text{UA}\_\text{CASUAL} = 0 \);
IF \( \text{INSERTIVE}\_\text{UA}\_\text{CASUAL} = . \) AND \( \text{RECEPTIVE}\_\text{UA}\_\text{CASUAL} = 0 \) THEN
\( \text{ANY}\_\text{UA}\_\text{CASUAL} = 0 \);
IF \( \text{INSERTIVE}\_\text{UA}\_\text{CASUAL} = 0 \) AND \( \text{RECEPTIVE}\_\text{UA}\_\text{CASUAL} = . \) THEN
\( \text{ANY}\_\text{UA}\_\text{CASUAL} = 0 \);
IF \( \text{INSERTIVE}\_\text{UA}\_\text{CASUAL} = . \) AND \( \text{RECEPTIVE}\_\text{UA}\_\text{CASUAL} = . \) THEN
\( \text{ANY}\_\text{UA}\_\text{CASUAL} = . \);
***NUMBER OF NON-MAIN PARTNERS WITH WHOM PARTICIPANTS INSERTED WITHOUT CONDOM****;
IF OMPYPBW.C= . THEN
    INSERTIVE_UA_NUMCASUAL= .;

IF OMPYPBW.C= .R THEN
    INSERTIVE_UA_NUMCASUAL= .;

IF OMPYPBW.C= .S THEN
    INSERTIVE_UA_NUMCASUAL= 0;

IF 1 <= OMPYPBW.C <= 50 THEN
    DO;
        INSERTIVE_UA_NUMCASUAL= OMPYPBW.C;
    END;

****FOR CASUAL PARTNER THIS LOOKS AT THE PERCENTAGE WHO DID INSERTIVE UA WITH AN HIV NEGATIVE NON-MAIN PARTNER AMONG THOSE WHO ENGAGED IN INSERTIVE UA WITH A CASUAL PARTNER;
IF INSERTIVE_UA_CASUAL= 1 THEN
    DO;
        IF SA23>0 THEN
            INSERTIVE_UA_CASUALNEG= 1;
        IF SA23= 0 THEN
            INSERTIVE_UA_CASUALNEG= 0;
    END;

**THIS LAST STATEMENT DOESN'T MATTER BECAUSE THE .S IS ELIMINATED BY THE DO COMMAND;

****NUMBER OF HIV-NEG NON-MAIN PARTNERS WITH WHOM PARTICIPANTS INSERTED WITHOUT CONDOM******;
IF SA23= .S THEN
    INSERTIVE_UA_NUMCASNEG = .;

IF SA23= 0 THEN
    INSERTIVE_UA_NUMCASNEG= 0;

IF SA23>0 THEN
    DO;
        INSERTIVE_UA_NUMCASNEG= SA23;
****PERCENT UNPROTECTED INSERTIVE ANAL WITH HIV-POSITIVE NON-MAIN PARTNER  
(Among those who engaged in unprotected insertive anal sex with any casual partner)****;
IF INSERTIVE_UA_CASUAL=1 THEN
DO;
  IF SA24>0 THEN
    INSERTIVE_UA_CASUALPOS =1;
  IF SA24=0 THEN
    INSERTIVE_UA_CASUALPOS=0;
  IF SA24=. THEN
    INSERTIVE_UA_CASUALPOS=.;
  IF SA24=.R THEN
    INSERTIVE_UA_CASUALPOS=.
  IF SA24=.S THEN
    INSERTIVE_UA_CASUALPOS=.

  **THIS LAST STATEMENT DOESN'T MATTER BECAUSE THE .S IS ELIMINATED BY THE DO COMMAND BECAUSE THEY DID HAVE AN INSERTIVE CASUAL PARTNER;
END;

****NUMBER OF HIV-POSITIVE NON-MAIN PARTNERS WITH WHOM PARTICIPANTS INSERTED WITHOUT CONDOM*****;
IF SA24=.S THEN
  INSERTIVE_UA_NUMCASPOS =.
IF SA24=0 THEN
  INSERTIVE_UA_NUMCASPOS=0;
IF SA24>0 THEN
  DO;
    INSERTIVE_UA_NUMCASPOS=SA24;
  END;

****PERCENT UNPROTECTED INSERTIVE ANAL WITH HIV-UNKNOWN NON-MAIN PARTNER  
(Among those who engaged in unprotected insertive anal sex with any partner)****;
IF INSERTIVE_UA_CASUAL=1 THEN
DO;
  IF SA25>0 THEN
    INSERTIVE_UA_CASUALUNK =1;
  IF SA25=0 THEN
    INSERTIVE_UA_CASUALUNK=0;
IF SA25=. THEN
    INSERTIVE_UA_CASUALUNK=.;

IF SA25=.R THEN
    INSERTIVE_UA_CASUALUNK=.;

IF SA25=.S THEN
    INSERTIVE_UA_CASUALUNK=.;

**THIS LAST STATEMENT DOESN'T MATTER BECAUSE THE .S
IS ELIMINATED BY THE DO COMMAND;
END;

****NUMBER OF HIV-UNKNOWN NON-MAIN PARTNERS WITH WHOM PARTICIPANTS
INSERTED WITHOUT CONDOM*****;
IF SA25=.S THEN
    INSERTIVE_UA_NUMCASUNK = .;

IF SA25=0 THEN
    INSERTIVE_UA_NUMCASUNK = 0;

IF SA25>0 THEN
    DO;
        INSERTIVE_UA_NUMCASUNK = SA25;
    END;

*******************;
****RECEPTIVE*******;
*******************;
***NUMBER OF NON-MAIN PARTNERS WITH WHOM PARTICIPANTS RECEPTIVE
WITHOUT CONDOM****;
IF OMPOPBWC=. THEN
    RECEPTIVE_UA_NUMCASUAL = .;

IF OMPOPBWC=.R THEN
    RECEPTIVE_UA_NUMCASUAL = .;

IF OMPOPBWC=.S THEN
    RECEPTIVE_UA_NUMCASUAL = 0;

IF 1<=OMPOPBWC<=50 THEN
    DO;
        RECEPTIVE_UA_NUMCASUAL = OMPOPBWC;
    END;

***FOR CASUAL PARTNER  THIS LOOKS AT THE PERCENTAGE WHO DID
RECEPTIVE UA WITH AN
HIV NEGATIVE NON-MAIN PARTNER AMONG THOSE WHO ENGAGED IN RECEPTIVE UA
WITH A CASUAL PARTNER;
IF RECEPTIVE_UA_CASUAL = 1 THEN
    DO;
IF SA28>0 THEN
    RECEPTIVE_UA_CASUALNEG=1;

IF SA28=0 THEN
    RECEPTIVE_UA_CASUALNEG=0;

IF SA28=. THEN
    RECEPTIVE_UA_CASUALNEG=.;

IF SA28=.R THEN
    RECEPTIVE_UA_CASUALNEG=.;

IF SA28=.S THEN
    RECEPTIVE_UA_CASUALNEG=.;

**THIS LAST STATEMENT DOESN'T MATTER BECAUSE THE .S IS ELIMINATED BY THE DO COMMAND;**

END;

****NUMBER OF HIV-NEG NON-MAIN PARTNERS WITH WHOM PARTICIPANTS RECEPTIVE WITHOUT CONDOM*****;

IF SA28=.S THEN
    RECEPTIVE_UA_NUMCASNEG =.;

IF SA28=0 THEN
    RECEPTIVE_UA_NUMCASNEG=0;

IF SA28>0 THEN
    DO;
        RECEPTIVE_UA_NUMCASNEG=SA28;
    END;

****PERCENT UNPROTECTED RECEPTIVE ANAL WITH HIV-POSITIVE NON-MAIN PARTNER (AMONG THOSE WHO ENGAGED IN UNPROTECTED RECEPTIVE ANAL SEX WITH ANY PARTNER)*****;

IF RECEPTIVE_UA_CASUAL=1 THEN
    DO;
        IF SA29>0 THEN
            RECEPTIVE_UA_CASUALPOS =1;
        IF SA29=0 THEN
            RECEPTIVE_UA_CASUALPOS=0;
        IF SA29=. THEN
            RECEPTIVE_UA_CASUALPOS=.;
        IF SA29=.R THEN
            RECEPTIVE_UA_CASUALPOS=.;
        IF SA29=.S THEN
            RECEPTIVE_UA_CASUALPOS=.;
**THIS LAST STATEMENT DOESN'T MATTER BECAUSE THE .S IS ELIMINATED BY THE DO COMMAND;
END;

****NUMBER OF HIV-POSITIVE NON-MAIN PARTNERS WITH WHOM PARTICIPANTS RECEPTIVE WITHOUT CONDOM*****;
IF SA29=.S THEN
  RECEPTIVE_UA_NUMCASPOS = .;
IF SA29=0 THEN
  RECEPTIVE_UA_NUMCASPOS=0;
IF SA29>0 THEN
  DO;
    RECEPTIVE_UA_NUMCASPOS=SA29;
  END;

****PERCENT UNPROTECTED RECEPTIVE ANAL WITH HIV-UNKNOWN NON-MAIN PARTNER (AMONG THOSE WHO ENGAGED IN UNPROTECTED RECEPTIVE ANAL SEX WITH ANY PARTNER)*****;
IF RECEPTIVE_UA_CASUAL=1 THEN
  DO;
    IF SA30>0 THEN
      RECEPTIVE_UA_CASUALUNK =1;
    IF SA30=0 THEN
      RECEPTIVE_UA_CASUALUNK=0;
    IF SA30=. THEN
      RECEPTIVE_UA_CASUALUNK=.;
    IF SA30=.R THEN
      RECEPTIVE_UA_CASUALUNK=.;
    IF SA30=.S THEN
      RECEPTIVE_UA_CASUALUNK=.;
  **THIS LAST STATEMENT DOESN'T MATTER BECAUSE THE .S IS ELIMINATED BY THE DO COMMAND;
END;

****NUMBER OF HIV-UNKNOWN NON-MAIN PARTNERS WITH WHOM PARTICIPANTS RECEPTIVE WITHOUT CONDOM*****;
IF SA30=.S THEN
  RECEPTIVE_UA_NUMCASUNK = .;
IF SA30=0 THEN
  RECEPTIVE_UA_NUMCASUNK=0;
IF SA30>0 THEN
DO;
  RECEPTIVE_UA_NUMCASNK=SA30;
END;

*****************************************************************************
***************;

*****THE CODE BELOW CREATES GENERAL MEASURE OF ANY UNPROTECTED ANAL
WITH ANY PARTNER
(ANY UA, ANY INSERTIVE UA, ANY RECEPTIVE UA);

*****************************************************************************
****************
******IF ANY_UA_MAIN=1 OR ANY_UA_CASUAL=1 THEN
  ANY_UA=1;
******IF ANY_UA_MAIN=0 AND ANY_UA_CASUAL=0 THEN
  ANY_UA=0;
******IF ANY_UA_MAIN=0 AND ANY_UA_CASUAL=. THEN
  ANY_UA=0;
******IF ANY_UA_MAIN=. AND ANY_UA_CASUAL=0 THEN
  ANY_UA=0;
******IF ANY_UA_MAIN=. AND ANY_UA_CASUAL=. THEN
  ANY_UA=.
******IF INSERTIVE_UA_MAIN=1 OR INSERTIVE_UA_CASUAL=1 THEN
  ANY_INSERTIVE_UA=1;
******IF INSERTIVE_UA_MAIN=0 AND INSERTIVE_UA_CASUAL=0 THEN
  ANY_INSERTIVE_UA=0;
******IF INSERTIVE_UA_MAIN=0 AND INSERTIVE_UA_CASUAL=. THEN
  ANY_INSERTIVE_UA=0;
******IF INSERTIVE_UA_MAIN=. AND INSERTIVE_UA_CASUAL=0 THEN
  ANY_INSERTIVE_UA=0;
******IF INSERTIVE_UA_MAIN=. AND INSERTIVE_UA_CASUAL=. THEN
  ANY_INSERTIVE_UA=.
******IF RECEPTIVE_UA_MAIN=1 OR RECEPTIVE_UA_CASUAL=1 THEN
  ANY_RECEPTIVE_UA=1;
******IF RECEPTIVE_UA_MAIN=0 AND RECEPTIVE_UA_CASUAL=0 THEN
  ANY_RECEPTIVE_UA=0;
******IF RECEPTIVE_UA_MAIN=0 AND RECEPTIVE_UA_CASUAL=. THEN
  ANY_RECEPTIVE_UA=0;

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IF RECEPTIVE_UA_MAIN=. AND RECEPTIVE_UA_CASUAL=0 THEN
    ANY_RECEPTIVE_UA=0;

IF RECEPTIVE_UA_MAIN=. AND RECEPTIVE_UA_CASUAL=. THEN
    ANY_RECEPTIVE_UA=.;

**********************************************************************
**************;
*THIS IS THE NEW CODE FOR THE NEW DESCRIPTIVE ANALYSIS THAT WILL
COMBINE MAIN
AND NON-MAIN PARTNERS AND USES ALL PARTICIPANTS AS DENOMINATOR. Table
1;

**********************************************************************
**************;
***THIS IS FOR MAIN PARTNERS;
****THIS IS FOR INSERTIVE WITH A HIV+ MAIN PARTNER;
IF HIVSTATL=1 THEN
    DO;
    IF INSERTIVE_UA_MAIN=1 THEN
        INSERTPOS_MAIN=1;
    IF INSERTIVE_UA_MAIN=0 THEN
        INSERTPOS_MAIN=0;
    IF INSERTIVE_UA_MAIN=. THEN
        INSERTPOS_MAIN=.;
    END;

IF HIVSTATL=2 OR HIVSTATL=3 THEN
    INSERTPOS_MAIN=0;

IF HIVSTATL=.S THEN
    INSERTPOS_MAIN=0;

IF HIVSTATL=.R THEN
    INSERTPOS_MAIN=.;

IF HIVSTATL=. THEN
    INSERTPOS_MAIN=.;

****THIS IS FOR INSERTIVE WITH A HIV-NEGATIVE MAIN PARTNER;
IF HIVSTATL=2 THEN
    DO;
    IF INSERTIVE_UA_MAIN=1 THEN
        INSERTNEG_MAIN=1;
    IF INSERTIVE_UA_MAIN=0 THEN
        INSERTNEG_MAIN=0;
    IF INSERTIVE_UA_MAIN=. THEN
        INSERTNEG_MAIN=.;

    END;

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INSERTNEG_MAIN=.;
END;

IF HIVSTATL=3 OR HIVSTATL=1 THEN
INSERTNEG_MAIN=0;

IF HIVSTATL= S THEN
INSERTNEG_MAIN=0;

IF HIVSTATL= R THEN
INSERTNEG_MAIN=.;

IF HIVSTATL= THEN
INSERTNEG_MAIN=.;

****THIS IS FOR INSERTIVE WITH A HIV UNKNOWN MAIN PARTNER;
IF HIVSTATL=3 THEN
DO;
   IF INSERTIVE_UA_MAIN=1 THEN
      INSERTUNK_MAIN=1;
   IF INSERTIVE_UA_MAIN=0 THEN
      INSERTUNK_MAIN=0;
   IF INSERTIVE_UA_MAIN= THEN
      INSERTUNK_MAIN=.;
   END;

IF HIVSTATL=1 OR HIVSTATL=2 THEN
INSERTUNK_MAIN=0;

IF HIVSTATL= S THEN
INSERTUNK_MAIN=0;

IF HIVSTATL= R THEN
INSERTUNK_MAIN=.;

IF HIVSTATL= THEN
INSERTUNK_MAIN=.;

***THIS IS FOR RECEPTIVE MAIN;
****THIS IS FOR RECEPTIVE WITH A HIV+ MAIN PARTNER;
IF HIVSTATL=1 THEN
DO;
   IF RECEPTIVE_UA_MAIN=1 THEN
      RECEPPOS_MAIN=1;
   IF RECEPTIVE_UA_MAIN=0 THEN
      RECEPPOS_MAIN=0;
   IF RECEPTIVE_UA_MAIN= THEN
      RECEPPOS_MAIN=.;

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END;

IF HIVSTATL=2 OR HIVSTATL=3 THEN
RECEPTPOS_MAIN=0;

IF HIVSTATL=.S THEN
RECEPTPOS_MAIN=0;

IF HIVSTATL=.R THEN
RECEPTPOS_MAIN=.

IF HIVSTATL=. THEN
RECEPTPOS_MAIN=.

****THIS IS FOR RECEPITIVE WITH A HIV-NEGATIVE MAIN PARTNER;
IF HIVSTATL=2 THEN
DO;
  IF RECEPTIVE_UA_MAIN=1 THEN
  RECEPTNEG_MAIN=1;

  IF RECEPTIVE_UA_MAIN=0 THEN
  RECEPTNEG_MAIN=0;

  IF RECEPTIVE_UA_MAIN=.
  RECEPTNEG_MAIN=.

END;

IF HIVSTATL=3 OR HIVSTATL=1 THEN
RECEPTNEG_MAIN=0;

IF HIVSTATL=.S THEN
RECEPTNEG_MAIN=0;

IF HIVSTATL=.R THEN
RECEPTNEG_MAIN=.

IF HIVSTATL=. THEN
RECEPTNEG_MAIN=.

****THIS IS FOR RECEPITIVE WITH A HIV UNKNOWN MAIN PARTNER;
IF HIVSTATL=3 THEN
DO;
  IF RECEPTIVE_UA_MAIN=1 THEN
  RECEPUNK_MAIN=1;

  IF RECEPTIVE_UA_MAIN=0 THEN
  RECEPUNK_MAIN=0;

  IF RECEPTIVE_UA_MAIN=.
  RECEPUNK_MAIN=.

END;
IF HIVSTATL=1 OR HIVSTATL=2 THEN
RECEPTUNK_MAIN=0;

IF HIVSTATL=.S THEN
RECEPTUNK_MAIN=0;

IF HIVSTATL=.R THEN
RECEPTUNK_MAIN=.;

IF HIVSTATL=. THEN
RECEPTUNK_MAIN=.

**********************************************************************
*******;
*THIS IS THE NEW CODE FOR THE NEW DESCRIPTIVE ANALYSIS THAT WILL
COMBINE MAIN
AND NON-MAIN PARTNERS AND USES ALL PARTICIPANTS AS DENOMINATOR. TABLE
1;
**********************************************************************
*****;
**THIS IS FOR CASUAL PARTNERS;
**INSERTIVE;
IF INSERTIVE_UA_CASUAL=1 THEN
DO;
  IF INSERTIVE_UA_CASUALPOS=1 THEN
   INSERTPOS_CASUAL=1;

  IF INSERTIVE_UA_CASUALPOS=0 THEN
   INSERTPOS_CASUAL=0;

  IF INSERTIVE_UA_CASUALPOS=. THEN
   INSERTPOS_CASUAL=.;
END;

IF INSERTIVE_UA_CASUAL=0 THEN
INSERTPOS_CASUAL=0;

IF INSERTIVE_UA_CASUAL= . THEN
INSERTPOS_CASUAL= . ;

IF INSERTIVE_UA_CASUAL=1 THEN
DO;
  IF INSERTIVE_UA_CASUALNEG=1 THEN
   INSERTNEG_CASUAL=1;

  IF INSERTIVE_UA_CASUALNEG=0 THEN
   INSERTNEG_CASUAL=0;

  IF INSERTIVE_UA_CASUALNEG=. THEN
   INSERTNEG_CASUAL=.;
END;

IF INSERTIVE_UA_CASUAL=0 THEN
  INSERTNEG_CASUAL=0;

IF INSERTIVE_UA_CASUAL=. THEN
  INSERTNEG_CASUAL=.

IF INSERTIVE_UA_CASUAL=1 THEN
  DO;
    IF INSERTIVE_UA_CASUALUNK=1 THEN
      INSERTUNK_CASUAL=1;
    IF INSERTIVE_UA_CASUALUNK=0 THEN
      INSERTUNK_CASUAL=0;
    IF INSERTIVE_UA_CASUALUNK=.
      THEN
      INSERTUNK_CASUAL=.
  END;

END;

IF INSERTIVE_UA_CASUAL=0 THEN
  INSERTUNK_CASUAL=0;

IF INSERTIVE_UA_CASUAL=.
  THEN
  INSERTUNK_CASUAL=.

**THIS IS FOR RECEPTIVE;
IF RECEPTIVE_UA_CASUAL=1 THEN
  DO;
    IF RECEPTIVE_UA_CASUALPOS=1 THEN
      RECEPPOS_CASUAL=1;
    IF RECEPTIVE_UA_CASUALPOS=0 THEN
      RECEPPOS_CASUAL=0;
    IF RECEPTIVE_UA_CASUALPOS=.
      THEN
      RECEPPOS_CASUAL=.
  END;

IF RECEPTIVE_UA_CASUAL=0 THEN
  RECEPPOS_CASUAL=0;

IF RECEPTIVE_UA_CASUAL=.
  THEN
  INSERTPOS_CASUAL=.

IF RECEPTIVE_UA_CASUAL=1 THEN
  DO;
    IF RECEPTIVE_UA_CASUALNEG=1 THEN
      RECEPNEG_CASUAL=1;
    IF RECEPTIVE_UA_CASUALNEG=0 THEN
      RECEPNEG_CASUAL=0;

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IF RECEPTIVE_UA_CASUALNEG=. THEN
  RECEPNEG_CASUAL=.;
END;

IF RECEPTIVE_UA_CASUAL=0 THEN
  RECEPNEG_CASUAL=0;
END;

IF RECEPTIVE_UA_CASUAL=. THEN
  RECEPNEG_CASUAL=.;
END;

IF RECEPTIVE_UA_CASUAL=1 THEN
  DO;
    IF RECEPTIVE_UA_CASUALUNK=1 THEN
      RECEPTUNK_CASUAL=1;
    IF RECEPTIVE_UA_CASUALUNK=0 THEN
      RECEPTUNK_CASUAL=0;
    IF RECEPTIVE_UA_CASUALUNK=. THEN
      RECEPTUNK_CASUAL=.;
  END;
END;

IF RECEPTIVE_UA_CASUAL=0 THEN
  RECEPTUNK_CASUAL=0;
END;

IF RECEPTIVE_UA_CASUAL=. THEN
  RECEPTUNK_CASUAL=.;

**********************************************************************;
*THIS PUTS THE MAIN AND NON-MAIN PARTNERS TOGETHER FOR EACH SEROSTATUS PARTNER. TO BE USED WITH THE FULL DENOMINATOR. TABLE 1;
**********************************************************************;

**FOR INSERTIVE;
IF INSERTPOS_CASUAL=1 OR INSERTPOS_MAIN =1 THEN
  INSERTPOS_ALL =1;
IF INSERTPOS_CASUAL=0 AND INSERTPOS_MAIN =0 THEN
  INSERTPOS_ALL =0;
IF INSERTPOS_CASUAL= . AND INSERTPOS_MAIN =0 THEN
  INSERTPOS_ALL =0;
IF INSERTPOS_CASUAL=0 AND INSERTPOS_MAIN =. THEN
  INSERTPOS_ALL =0;
IF INSERTPOS_CASUAL= . AND INSERTPOS_MAIN =. THEN
  INSERTPOS_ALL=.;
IF INSERTNEG_CASUAL=1 OR INSERTNEG_MAIN =1 THEN
INSERTNEG_ALL =1;

IF INSERTNEG_CASUAL=0 AND INSERTNEG_MAIN =0 THEN
INSERTNEG_ALL =0;

IF INSERTNEG_CASUAL=0 AND INSERTNEG_MAIN =0 THEN
INSERTNEG_ALL =0;

IF INSERTNEG_CASUAL=0 AND INSERTNEG_MAIN =. THEN
INSERTNEG_ALL =0;

IF INSERTNEG_CASUAL=. AND INSERTNEG_MAIN =. THEN
INSERTNEG_ALL=.

IF INSERTNEG_CASUAL=1 OR INSERTNEG_MAIN =1 THEN
INSERTNEG_ALL =1;

IF INSERTNEG_CASUAL=0 AND INSERTNEG_MAIN =0 THEN
INSERTNEG_ALL =0;

IF INSERTNEG_CASUAL=0 AND INSERTNEG_MAIN =0 THEN
INSERTNEG_ALL =0;

IF INSERTNEG_CASUAL=. AND INSERTNEG_MAIN =. THEN
INSERTNEG_ALL =0;

***FOR RECEPTIVE;
IF RECEPTPOS_CASUAL=1 OR RECEPTPOS_MAIN =1 THEN
RECEPTPOS_ALL =1;

IF RECEPTPOS_CASUAL=0 AND RECEPTPOS_MAIN =0 THEN
RECEPTPOS_ALL =0;

IF RECEPTPOS_CASUAL=0 AND RECEPTPOS_MAIN =0 THEN
RECEPTPOS_ALL =0;

IF RECEPTPOS_CASUAL=. AND RECEPTPOS_MAIN =. THEN
RECEPTPOS_ALL =0;

IF RECEPTPOS_CASUAL=. AND RECEPTPOS_MAIN =. THEN
RECEPTPOS_ALL=.

IF RECEPTNEG_CASUAL=1 OR RECEPTNEG_MAIN =1 THEN
RECEPTNEG_ALL =1;

IF RECEPTNEG_CASUAL=0 AND RECEPTNEG_MAIN =0 THEN
RECEPTNEG_ALL =0;

IF RECEPTNEG_CASUAL=0 AND RECEPTNEG_MAIN =0 THEN
RECEPTNEG_ALL =0;

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IF RECEPTNEG_CASUAL= . AND RECEPTNEG_MAIN = 0 THEN 
RECEPTNEG_ALL = 0;

IF RECEPTNEG_CASUAL= 0 AND RECEPTNEG_MAIN = . THEN 
RECEPTNEG_ALL = 0;

IF RECEPTNEG_CASUAL= . AND RECEPTNEG_MAIN = . THEN 
RECEPTNEG_ALL= .;

IF RECEPTNEG_CASUAL=1 OR RECEPTNEG_MAIN =1 THEN 
RECEPTNEG_ALL =1;

IF RECEPTNEG_CASUAL=0 AND RECEPTNEG_MAIN =0 THEN 
RECEPTNEG_ALL =0;

IF RECEPTNEG_CASUAL= . AND RECEPTNEG_MAIN =0 THEN 
RECEPTNEG_ALL =0;

IF RECEPTNEG_CASUAL=0 AND RECEPTNEG_MAIN = . THEN 
RECEPTNEG_ALL = 0;

IF RECEPTNEG_CASUAL= . AND RECEPTNEG_MAIN = . THEN 
RECEPTNEG_ALL= .;

**THIS CREATES A COMBINED VARIABLE OF UAI (INSERT OR RECEPT) WITH AT-RISK PARTNERS FOR THE 
HIV-POSITIVE SUGROUP. TABLE 5 DV AND ALSO DESCRIPTIVE SUMMARY FOR THE TEXT; 
IF INSERTNEG_ALL=1 OR INSERTUNK_ALL=1 OR RECEPTNEG_ALL=1 OR 
RECEPTUNG_ALL=1 THEN 
UA_HIVNEGUNK=1; 
ELSE UA_HIVNEGUNK=0;

*THIS ELSE COMMAND 
WORKS BECAUSE THERE ARE NO MISSING;

***THIS CREATES A COMBINED VARIABLE OF UAI (INSERT OR RECEPT) WITH 
HIV+ OR HIV? PARTNERS 
FOR HIV-NEGATIVE AND HIV-UNKNOWN PARTICIPANTS. FOR THE TEXT; 
IF INSERTPOS_ALL=1 OR INSERTUNK_ALL=1 OR RECEPTPOS_ALL=1 OR 
RECEPTUNG_ALL=1 THEN 
UA_HIVPOSUNK=1; 
ELSE UA_HIVPOSUNK=0;

****THIS NEXT COMMAND IS OUT OF PLACE;
*****THIS CREATES AND COMBINED NUMBER OF PARTNERS FOR MAIN AND NON-
MAIN SUMMED; 
TOTINSERTPOS=SUM(OF INSERTIVE_UA_NUMCASPOS INSERTPOS_MAIN);

****THIS CREATES NUMBER OF PARTNERS (COMBING MAIN AND CASUAL) FOR 
NEW TABLE 1****;
***THE VARIABLE BELOW THE NUMALL VARIABLE INDICATES THE PERCENTAGE WHO HAD 2 OR MORE PARTNERS***;

`INSERTIVE_NUMPOSALL= SUM(OF INSERTIVE_UA_NUMCASPOS INSERTPOS_MAIN);`

```plaintext
IF INSERTIVE_NUMPOSALL=0 OR INSERTIVE_NUMPOSALL=1 THEN
  TWOPLUS_INSERTPOS=0;

IF INSERTIVE_NUMPOSALL>1 THEN
  TWOPLUS_INSERTPOS=1;

INSERTIVE_NUMNEGALL= SUM(OF INSERTIVE_UA_NUMCASNEG INSERTNEG_MAIN);

IF INSERTIVE_NUMNEGALL=0 OR INSERTIVE_NUMNEGALL=1 THEN
  TWOPLUS_INSERTNEG=0;

IF INSERTIVE_NUMNEGALL>1 THEN
  TWOPLUS_INSERTNEG=1;

INSERTIVE_NUMUNKALL= SUM(OF INSERTIVE_UA_NUMCASUNK INSERTUNK_MAIN);

IF INSERTIVE_NUMUNKALL=0 OR INSERTIVE_NUMUNKALL=1 THEN
  TWOPLUS_INSERTUNK=0;

IF INSERTIVE_NUMUNKALL>1 THEN
  TWOPLUS_INSERTUNK=1;

RECEPTIVE_NUMPOSALL= SUM(OF RECEPTIVE_UA_NUMCASPOS RECEPTRPOS_MAIN);

IF RECEPTIVE_NUMPOSALL=0 OR RECEPTIVE_NUMPOSALL=1 THEN
  TWOPLUS_RECEPTPOS=0;

IF RECEPTIVE_NUMPOSALL>1 THEN
  TWOPLUS_RECEPTPOS=1;

RECEPTIVE_NUMNEGALL= SUM(OF RECEPTIVE_UA_NUMCASNEG RECEPTRNEG_MAIN);

IF RECEPTIVE_NUMNEGALL=0 OR RECEPTIVE_NUMNEGALL=1 THEN
  TWOPLUS_RECEPTNEG=0;

IF RECEPTIVE_NUMNEGALL>1 THEN
  TWOPLUS_RECEPTNEG=1;

RECEPTIVE_NUMUNKALL= SUM(OF RECEPTIVE_UA_NUMCASUNK RECEPTRUNK_MAIN);

IF RECEPTIVE_NUMUNKALL=0 OR RECEPTIVE_NUMUNKALL=1 THEN
  TWOPLUS_RECEPTRUNK=0;

IF RECEPTIVE_NUMUNKALL>1 THEN
  TWOPLUS_RECEPTRUNK=1;
```

************************************************************;
*****NUMBER OF PARTNERS FOR SEROSORTING ANALYSIS***********;
****THIS CAN ALSO BE APPLIED TO THE STRATEGIC POSITIONING OUTCOME;
*****************************************************************************;

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*This creates index of number of partners so we can examine whether
the serosorting
effect was due to groups having different number of partners;

*First way assumes that insertive and receptive involves the same
partner. Thus, we average the insertive and receptive partners instead of summing. This will
undercount the true number of partners;
TOTAL_MEANNEGALL=MEAN(OF INSERTIVE_NUMNEGALL RECEPTIVE_NUMNEGALL);
TOTAL_MEANPOSALL=MEAN(OF INSERTIVE_NUMPOSALL RECEPTIVE_NUMPOSALL);
TOTAL_MEANUNKALL=MEAN(OF INSERTIVE_NUMUNKALL RECEPTIVE_NUMUNKALL);
GRANDTOT_SUMALL1=SUM(OF TOTAL_MEANNEGALL TOTAL_MEANPOSALL
TOTAL_MEANUNKALL);

*This is
summed because the three partner groups reflect unique partners. This would
be applied only to the group of self-reported men who did not serosort;

*Second way assumes that insertive and receptive are unique partners.
Thus, we sum the insertive and receptive partners instead of averaging. This will
overcount the true number of partners;
TOTAL_SUMNEGALL=SUM(OF INSERTIVE_NUMNEGALL RECEPTIVE_NUMNEGALL);
TOTAL_SUMPOSALL=SUM(OF INSERTIVE_NUMPOSALL RECEPTIVE_NUMPOSALL);
TOTAL_SUMUNKALL=SUM(OF INSERTIVE_NUMUNKALL RECEPTIVE_NUMUNKALL);
GRANDTOT_SUMALL2=SUM(OF TOTAL_SUMNEGALL TOTAL_SUMPOSALL
TOTAL_SUMUNKALL);

*This is
summed because the three partner groups reflect unique partners. This would
be applied only to the group of self-reported men who did not serosort;

*Third way calculates number of partners by taking the higher number
for either insertive
or receptive. This should give you a number that follows between the
two approaches above;

*For negative partners;
IF INSERTIVE_NUMNEGALL > RECEPTIVE_NUMNEGALL THEN
DO;
    NEWNUMNEG=INSERTIVE_NUMNEGALL;
END;

IF RECEPTIVE_NUMNEGALL > INSERTIVE_NUMNEGALL THEN
DO;
    NEWNUMNEG=RECEPTIVE_NUMNEGALL;
IF RECEPTIVE_NUMNEGALL=INSERTIVE_NUMNEGALL THEN DO; NEWNUMNEG=RECEPTIVE_NUMNEGALL; END;

*FOR POSITIVE PARTNERS;
IF INSERTIVE_NUMPOSALL > RECEPTIVE_NUMPOSALL THEN DO; NEWNUMPOS=INSERTIVE_NUMPOSALL; END;
.If RECEPTIVE_NUMPOSALL > INSERTIVE_NUMPOSALL THEN DO; NEWNUMPOS=RECEPTIVE_NUMPOSALL; END;
IF RECEPTIVE_NUMPOSALL = INSERTIVE_NUMPOSALL THEN DO; NEWNUMPOS=RECEPTIVE_NUMPOSALL; END;

*FOR UNKNOWN PARTNERS;
IF INSERTIVE_NUMUNKALL > RECEPTIVE_NUMUNKALL THEN DO; NEWNUMUNK=INSERTIVE_NUMUNKALL; END;
IF RECEPTIVE_NUMUNKALL > INSERTIVE_NUMUNKALL THEN DO; NEWNUMUNK=RECEPTIVE_NUMUNKALL; END;
IF RECEPTIVE_NUMUNKALL = INSERTIVE_NUMUNKALL THEN DO; NEWNUMUNK=RECEPTIVE_NUMUNKALL; END;

GRANDTOT_NEWNUM=SUM(OF NEWNUMNEG NEWNUMPOS NEWNUMUNK);

************************GREG'S STUFF*************************************;
*START HERE, NEW CODE FOR GREG;
******************************************************************************;
***FOR THOSE WITH NO CASUAL PARTNER BUT A MAIN PARTNER;
IF ANALCASUAL=0 AND (CR3MOMAN=1 OR CR3MOMAN=2) THEN DO;
  IF ANAL_3MO=2 THEN
    MAININSERT1=0;
  IF ANAL_3MO=1 AND (1<CR_CUSE<=5) THEN
MAININSERT1=1;

IF ANAL_3MO=1 AND CR_CUSE=1 THEN
    MAININSERT1=0;

IF CR_REC=2 THEN
    MAINRECEPT1=0;

IF CR_REC=1 AND (1<CRECUSE<=5) THEN
    MAINRECEPT1=1;

IF CR_REC=1 AND CRECUSE=1 THEN
    MAINRECEPT1=0;

IF MAININSERT1=1 AND MAINRECEPT1=0 THEN
    POSITIONMAIN1=1;

IF MAININSERT1=0 AND MAINRECEPT1=1 THEN
    POSITIONMAIN1=0;

IF MAININSERT1=1 AND MAINRECEPT1=1 THEN
    POSITIONMAIN1=0;

IF MAININSERT1=0 AND MAINRECEPT1=0 THEN
    POSITIONMAIN1=0;

END;

****FOR THOSE WITH NO MAIN PARTNER BUT A CASUAL PARTNER;
IF CR3MOMAN=3 AND ANALCASUAL=1 THEN
    DO;
        IF IP_AB=2 AND IP_YB=1 THEN
            POSITIONCAS1=0;
        
        IF IP_AB=2 AND IP_YB=2 THEN
            POSITIONCAS1=0;
        
        IF IP_AB=1 AND IP_YB=2 THEN
            POSITIONCAS1=1;
        
        **UNPROTECTED INSERTIVE ONLY;
        IF IP_AB=1 AND IP_YB=1 THEN
            POSITIONCAS1=0;
    END;

*FOR THOSE WITH BOTH MAIN AND CASUAL PARTNERS;
IF (CR3MOMAN=1 OR CR3MOMAN=2) AND ANALCASUAL = 1 THEN
    DO;
        IF IP_AB=2 AND IP_YB=1 THEN
            POSITIONCAS=2;
        
        **no insertive sex, but yes receptive UAI**;
        IF IP_AB=2 AND IP_YB=2 THEN
            POSITIONCAS=2;
    END;
POSITIONCAS=0;

** no unprotected anal sex**;
IF IP_AB=1 AND IP_YB=2 THEN
   POSITIONCAS=1;

**insertive UAI, no unprotected receptive**;
IF IP_AB=1 AND IP_YB=1 THEN
   POSITIONCAS=2;

** insert UAI and receptive UAI with casual**;
IF ANAL_3MO=2 THEN
   MAININSERT=0;

IF ANAL_3MO=1 AND (1<CR_CUSE<=5) THEN
   MAININSERT=1;

IF ANAL_3MO=1 AND CR_CUSE=1 THEN
   MAININSERT=0;

IF CR3MOMAN=3 THEN
   MAINRECEPT=0;

IF CR_REC=2 THEN
   MAINRECEPT=0;

IF CR_REC=1 AND (1<CRECUSE<=5) THEN
   MAINRECEPT=1;

IF CR_REC=1 AND CRECUSE=1 THEN
   MAINRECEPT=0;

IF MAININSERT=1 AND MAINRECEPT=0 THEN
   POSITIONMAIN=2;

IF MAININSERT=0 AND MAINRECEPT=1 THEN
   POSITIONMAIN=0;

IF MAININSERT=1 AND MAINRECEPT=1 THEN
   POSITIONMAIN=0;

IF MAININSERT=0 AND MAINRECEPT=0 THEN
   POSITIONMAIN=1;

** no unprotected insert or receptive with main partner**;
IF POSITIONCAS=2 AND POSITIONMAIN=2 THEN
   POSITIONFUN=0;

IF POSITIONCAS=2 AND POSITIONMAIN=1 THEN
   POSITIONFUN=0;

IF POSITIONCAS=2 AND POSITIONMAIN=0 THEN
POSITIONFUN=0;

IF POSITIONCAS=1 AND POSITIONMAIN=2 THEN
POSITIONFUN=1;

IF POSITIONCAS=1 AND POSITIONMAIN=1 THEN
POSITIONFUN=1;

IF POSITIONCAS=1 AND POSITIONMAIN=0 THEN
POSITIONFUN=0;

IF POSITIONCAS=0 AND POSITIONMAIN=2 THEN
POSITIONFUN=1;

IF POSITIONCAS=0 AND POSITIONMAIN=1 THEN
POSITIONFUN=0;

IF POSITIONCAS=0 AND POSITIONMAIN=0 THEN
POSITIONFUN=0;

END;

*****THE VARIABLE BELOW GETS THE FINAL VARIABLE REFLECTING ONLY
UNPROTECTED INSERTIVE
AND NO UNPROTECTIVE RECEPTIVE;
IF POSITIONMAIN1=1 OR POSITIONCAS1=1 OR POSITIONFUN=1 THEN
POSITIONFINAL=1;
ELSE POSITIONFINAL=0;

*******************************************************************************END GREG'S
STUFF*******************************************************************************;
IF HCONFIRMRES=1 AND SEROSTATUS=0 THEN
UNRECOGNIZEUNK=1;
ELSE UNRECOGNIZEUNK=0;

IF HCONFIRMRES=1 AND SEROSTATUS=1 THEN
UNRECOGNIZENEG=1;
ELSE UNRECOGNIZENEG=0;

IF UNRECOGNIZEUNK=1 OR UNRECOGNIZENEG=1 THEN
UNRECOGNIZE=1;
ELSE UNRECOGNIZE=0;

IF SEROSTATUS=0 AND (HCONFIRMRES=1 OR HCONFIRMRES=0 OR HCONFIRMRES=2
OR HCONFIRMRES=7
    OR HCONFIRMRES=8 OR HCONFIRMRES=9) THEN
NEWSEROSTAT=3;

*THIS IS HIV-NEGATIVE/UNAWARE;
IF SEROSTATUS=1 AND (HCONFIRMRES=1 OR HCONFIRMRES=0 OR HCONFIRMRES=2
OR HCONFIRMRES=7
    OR HCONFIRMRES=8 OR HCONFIRMRES=9) THEN
NEWSEROSTAT=3;
*THIS IS HIV-NEG/AWARE BUT THEY ARE COMBINED WITH THE HIV-NEGATIVE/UNAWARE BECAUSE THE PREVALENCE OF RISKY SEX IS HIGHLY SIMILAR IN THESE TWO GROUPS; IF HCONFIRMRES=1 AND (SEROSTATUS=0 OR SEROSTATUS=1) THEN NEWSEROSTAT=1;

*UNRECOGNIZED INFECTION; IF SEROSTATUS=2 THEN NEWSEROSTAT=2;

* HIV+/ AWARE; * NEW UNRECOGNIZED VARIABLE; * HT8 IS HOW LIKELY YOU ARE TO BE INFECTED; IF NEWSEROSTAT=1 AND (1<=HT8<=5) THEN NEWUNAWARE=1;

IF NEWSEROSTAT=1 AND (6<=HT8<=10) THEN NEWUNAWARE=2;

IF NEWSEROSTAT = 1 THEN UNRECOGNIZED = 1;
ELSE IF NEWSEROSTAT IN (2, 3) THEN UNRECOGNIZED = 0;
ELSE IF NEWSEROSTAT IN (. , .R) THEN UNRECOGNIZED = .;

** THESE COMMANDS BRING IN SUBGROUPS OF PARTICIPANTS; * IF SITEID=2 OR SITEID=3; * IF SEROSTATUS=1;
* OR SEROSTATUS=2;
* IF ANALCASUAL=1;
* IF SEROSTATUS=1;
* IF NEWSEROSTAT=2 or NEWSEROSTAT=1;
* IF HIVSTAT_MAIN=2;
* IF ANY_RECEPTIVE_UA=1;
* IF ANY_INSERTIVE_UA=1;
* IF MAINPARTNER=1;
* IF ANY UA CASUAL=0;
* 0 MEANS NO UA WITH CASUAL PARTNERS;
**** THIS CREATES THE SERODISCORDANT/UNKNOWN UA VARIABLE FOR THE REGRESSION ANALYSIS****;
IF NEWSEROSTAT=1 OR NEWSEROSTAT=2 THEN DO;
   IF UA_HIVNEGUNK=1 THEN DISCORDANT_UA = 1;
   IF UA_HIVNEGUNK=0 THEN DISCORDANT_UA=0;
END;

IF NEWSEROSTAT=3 THEN
DO;
  IF UA_HIVPOSUNK=1 THEN
    DISCORDANT_UA = 1;
  
  IF UA_HIVPOSUNK=0 THEN
    DISCORDANT_UA=0;
END;

**THIS IS TO CREATE THE SEROSORTING COMPARISONS FOR HIV+/AWARE AND HIV+/UNAWARE****;
  IF INSERTPOS_ALL =1 AND INSERTNEG_ALL=0 AND INSERTUNK_ALL=0 THEN
    POSSEROSORT_INSERT=1;
  ELSE POSSEROSORT_INSERT=0;

  IF RECEPTR_POS_ALL =1 AND RECEPTRNEG_ALL=0 AND RECEPTRUNK_ALL=0 THEN
    POSSEROSORT_RECEPT=1;
  ELSE POSSEROSORT_RECEPT=0;

  IF ANY_INSERTIVE_UA=1 THEN
    DO;
      IF POSSEROSORT_INSERT=1 THEN
        NEWA=1;
      IF POSSEROSORT_INSERT=0 THEN
        NEWA=0;
      IF POSSEROSORT_INSERT=. THEN
        NEWA=.;
    END;

  IF ANY_RECEPTIVE_UA=1 THEN
    DO;
      IF POSSEROSORT_RECEPT=1 THEN
        NEWB=1;
      IF POSSEROSORT_RECEPT=0 THEN
        NEWB=0;
      IF POSSEROSORT_RECEPT=. THEN
        NEWB=.;
    END;

  IF NEWA=1 AND NEWB=1 THEN
    POSSEROSORT_ALL=1;
  *ELSE POSSEROSORT_ALL=0;
  IF NEWA=1 AND NEWB= . THEN
    POSSEROSORT_ALL=1;

  IF NEWA=. AND NEWB=1 THEN
    POSSEROSORT_ALL=1;
IF NEWA=1 AND NEWB=0 THEN
POSSEROSORT_ALL=0;

IF NEWA=0 AND NEWB=1 THEN
POSSEROSORT_ALL=0;

IF NEWA=0 AND NEWB=0 THEN
POSSEROSORT_ALL=0;

IF NEWA=0 AND NEWB=0 THEN
POSSEROSORT_ALL=0;

IF NEWA=. AND NEWB=1 THEN
POSSEROSORT_ALL=0;

IF NEWA=. AND NEWB=. THEN
POSSEROSORT_ALL=.;

*IF POSSEROSORT_INSERT=1 OR POSSEROSORT_RECEPT=1 THEN
POSSEROSORT_ALL=1;
*ELSE POSSEROSORT_ALL=0;

**THIS CREATES A VARIABLE, FOR HIV+/UNAWARE, REFLECTING EXCLUSIVE UAI
WITH HIV-NEGATIVE
PARTNERS AS SUGGESTED BY THE REVIEWERS FROM AIDS AND BEHAVIOR;

*USE THE CODING BELOW;
**THIS CREATES THE SEROSORTING FOR HIV-NEGATIVE PARTICIPANTS****;

/*IF INSERTNEG_ALL=1 AND INSERTPOS_ALL=0 AND INSERTUNK_ALL=0 THEN
NEGGEROSORT_INSERT=1;
ELSE NEGSEROSORT_INSERT=0;

IF RECEPNeg_ALL=1 AND RECEPPOS_ALL=0 AND RECEPUNK_ALL=0 THEN
NEGGEROSORT_RECEPT=1;
ELSE NEGSEROSORT_RECEPT=0;*/

**NEW VARIABLES FOR NEGATIVE SEROSORTING TO COMBINE INSERTIVE AND
RECEPTIVE POSITIONS;
IF ANY_INSERTIVE_UA=1 THEN
DO;
   IF INSERTNEG_ALL=1 AND INSERTPOS_ALL=0 AND INSERTUNK_ALL=0
THEN
      NEGSEROSORT_INSERT=1;
      ELSE NEGSEROSORT_INSERT=0;
END;

IF ANY_RECEPTIVE_UA=1 THEN
DO;
   IF RECEPNeg_ALL=1 AND RECEPPOS_ALL=0 AND RECEPUNK_ALL=0
THEN
      NEGSEROSORT_RECEPT=1;

ELSE NEGSEROSORT_RECEPT=0;
END;

IF ANY_INSERTIVE_UA=1 AND ANY_RECEPTIVE_UA=1 THEN
  DO;
    IF NEGSEROSORT_INSERT=1 AND NEGSEROSORT_RECEPT=1 THEN
      SSNEG=0;
    ELSE SSNEG=1;
  END;

IF ANY_INSERTIVE_UA=1 AND ANY_RECEPTIVE_UA=0 THEN
  DO;
    IF NEGSEROSORT_INSERT=1 THEN
      SSNEG=0;
    ELSE SSNEG=1;
  END;

IF ANY_INSERTIVE_UA=0 AND ANY_RECEPTIVE_UA=1 THEN
  DO;
    IF NEGSEROSORT_RECEPT=1 THEN
      SSNEG=0;
    ELSE SSNEG=1;
  END;

****FOR SEROSORTING ANALYSIS**********************************************;
----------------------------------------------------------------------------------;
**THIS CREATES A GROUP OF MEN WHO USED A CONDOM WITH ALL PARTNERS AMONG THOSE WHO ENGAGED IN ANAL INTERCOURSE;
----------------------------------------------------------------------------------;
----------------------------------------------------------------------------------;
IF ANALMAIN=1 OR ANALCASUAL=1 THEN
  DO;
    *BRINGS IN MEN WHO HAD ANAL SEX WITH A MAIN OR CASUAL PARTNER;
    IF ANY_INSERTIVE_UA=1 OR ANY_RECEPTIVE_UA=1 THEN
      SOMEUA=1;
    ELSE SOMEUA=0;
    *THIS 0 GROUP ALWAYS USED A CONDOM DURING ANAL SEX;
  END;

IF SOMEUA=0 THEN
  NEWCOMPARISON=0;

*SOMEUA 0 MEANS NO UA;
IF SSNEG=1 THEN
  NEWCOMPARISON=1;

*SSNEG 0 MEANS SEROSORTER;
****THIS CREATES THE CODE FOR STRATEGIC POSITIONING*****;
*** THIS IS FOR THE TWO HIV+ AWARE/UNAWARE GROUPS***;
IF INSERTNEG_ALL=1 OR RECEPNeg_ALL=1 THEN
  DO;
  IF INSERTNEG_ALL=1 AND RECEPNeg_ALL=0 THEN
    POSSTRATEGIC_NEG=0;
  IF INSERTNEG_ALL=0 AND RECEPNeg_ALL=1 THEN
    POSSTRATEGIC_NEG=1;
  IF INSERTNEG_ALL=1 AND RECEPNeg_ALL=1 THEN
    POSSTRATEGIC_NEG=0;
  *COMBINING;
END;

IF INSERTUNK_ALL=1 OR RECEPNeg_ALL=1 THEN
  DO;
  IF INSERTUNK_ALL=1 AND RECEPNeg_ALL=0 THEN
    POSSTRATEGIC_UNK=0;
  IF INSERTUNK_ALL=0 AND RECEPNeg_ALL=1 THEN
    POSSTRATEGIC_UNK=1;
  IF INSERTUNK_ALL=1 AND RECEPNeg_ALL=1 THEN
    POSSTRATEGIC_UNK=0;
  *COMBINING;
END;

******STRATEGIC POSITIONING FOR HIV-NEGATIVE PARTICIPANTS******;
IF INSERTPOS_ALL=1 OR RECEPPOS_ALL=1 THEN
  DO;
  IF INSERTPOS_ALL=1 AND RECEPPOS_ALL=0 THEN
    NEGSTRATEGIC_POS=1;
  IF INSERTPOS_ALL=0 AND RECEPPOS_ALL=1 THEN
    NEGSTRATEGIC_POS=0;
  IF INSERTPOS_ALL=1 AND RECEPPOS_ALL=1 THEN
    NEGSTRATEGIC_POS=0;
  *COMBINING;
END;

IF INSERTUNK_ALL=1 OR RECEPPOS_ALL=1 THEN
  DO;
  IF INSERTUNK_ALL=1 AND RECEPPOS_ALL=0 THEN
    NEGSTRATEGIC_UNK=1;
  IF INSERTUNK_ALL=0 AND RECEPPOS_ALL=1 THEN
    NEGSTRATEGIC_UNK=0;
  IF INSERTUNK_ALL=1 AND RECEPPOS_ALL=1 THEN
    NEGSTRATEGIC_UNK=0;
  *COMBINING;
END;
NEGSTRATEGIC_UNK=0;

*COMBINING;
END;

*PEOPLE HOW HAD BOTH POSITIVE AND UNKNOWN UA PARTNERS;
IF (INSERTPOS_ALL=1 OR RECEPTRPOS_ALL=1) AND (INSERTUNK_ALL=1 OR RECEPTRUNK_ALL=1) THEN DO;
  IF NEGSTRATEGIC_POS=1 AND NEGSTRATEGIC_UNK=1 THEN ALLSTRATEGIC=0;
  ELSE ALLSTRATEGIC=1;
END;

*PEOPLE WHO HAD POSITIVE BUT NOT UNKNOWN UA PARTNERS;
IF (INSERTPOS_ALL=1 OR RECEPTRPOS_ALL=1) AND (INSERTUNK_ALL=0 AND RECEPTRUNK_ALL=0) THEN DO;
  IF NEGSTRATEGIC_POS=1 THEN ALLSTRATEGIC=0;
  ELSE ALLSTRATEGIC=1;
END;

*PEOPLE WHO DID NOT HAVE POSITIVE BUT DID HAVE UNKNOWN UA PARTNERS;
IF (INSERTPOS_ALL=0 AND RECEPTRPOS_ALL=0) AND (INSERTUNK_ALL=1 OR RECEPTRUNK_ALL=1) THEN DO;
  IF NEGSTRATEGIC_UNK=1 THEN ALLSTRATEGIC=0;
  ELSE ALLSTRATEGIC=1;
END;

****HIV TESTING OUTCOME IN THE STUDY;
IF HCONFIRMRES=1 THEN POSTEST=1;

IF HCONFIRMRES NE 1 THEN POSTEST=0;

*MSM NETWORK SIZE;
IF SITEID = 1 THEN DO;
  *LA;
  IF NAQ1LA IN (., .R) THEN
    NETWORK_MSM = .;
  ELSE NETWORK_MSM = NAQ1LA;
END;

IF SITEID = 2 THEN DO;
  *PHILLY;
  IF NAQ1PHIL IN (., .R) THEN
NETWORK_MSM = .;
ELSE NETWORK_MSM = NAQ1PHIL;
END;

IF SITEID = 3 THEN
DO;
*NYC BLACK;
IF NAQ1BNYC IN (. ,.R) THEN
NETWORK_MSM = .;
ELSE NETWORK_MSM = NAQ1BNYC;
END;

IF SITEID = 4 THEN
DO;
*NYC LATINO;
IF NAQ1LNYC IN (. ,.R) THEN
NETWORK_MSM = .;
ELSE NETWORK_MSM = NAQ1LNYC;
END;

*SOME RELIGION/SPIRITUALITY VARIABLES FOR TOMMIE...DERIVED FROM
BILLY'S HOMOPHOBIA PROGRAM...USE OR MODIFY AS NEEDED;
*FREQUENCY OF WORSHIP ATTENDANCE;
IF WORSHIP IN (. ,.R) THEN
WORSHIP_R = .;
ELSE IF WORSHIP = 1 THEN
WORSHIP_R = 1;
*NEVER;
ELSE IF WORSHIP = 5 THEN
WORSHIP_R = 2;
*< 1/MONTH;
ELSE IF WORSHIP = 4 THEN
WORSHIP_R = 3;
*1/MONTH;
ELSE IF WORSHIP = 3 THEN
WORSHIP_R = 4;
*2-3/MONTH;
ELSE IF WORSHIP = 2 THEN
WORSHIP_R = 5;
*1/WEEK;
IF WORSHIP_R IN (. ,.R) THEN
WORSHIPFREQUENCY1 = .;
ELSE IF WORSHIP_R IN (4,5) THEN
WORSHIPFREQUENCY1 = 3;
* > ONCE/MONTH;
ELSE IF WORSHIP_R IN (2,3) THEN
WORSHIPFREQUENCY1 = 2;

*ONCE/MONTH OR LESS;
ELSE IF WORSHIP_R = 1 THEN
WORSHIPFREQUENCY1 = 1;

*NEVER;
IF WORSHIP_R IN (. , .R) THEN
WORSHIPFREQUENCY2 = .;
ELSE IF WORSHIP_R = (5) THEN
WORSHIPFREQUENCY2 = 3;

*1/WEEK;
ELSE IF WORSHIP_R IN (3, 4) THEN
WORSHIPFREQUENCY2 = 2;

*ONCE/MONTH OR MORE;
ELSE IF WORSHIP_R IN (1, 2) THEN
WORSHIPFREQUENCY2 = 1;

<* 1/MONTH OR LESS;
*HOW MANY PEOPLE AT YOUR PLACE OF WORSHIP KNOW YOU HAVE SEX WITH MEN?;
IF SPI2 IN (. , .R) THEN
PEOPLEKNOWMSM1 = .;
ELSE IF SPI2 = .S THEN
PEOPLEKNOWMSM1 = 1;

*NO PLACE OF WORSHIP;
ELSE IF SPI2 IN (4, 5) THEN
PEOPLEKNOWMSM1 = 2;

<* HALF OR NONE;
ELSE IF SPI2 IN (1, 2, 3) THEN
PEOPLEKNOWMSM1 = 3;

* HALF OR MORE;
IF SPI2 IN (. , .R) THEN
PEOPLEKNOWMSM2 = .;
ELSE IF SPI2 IN (.S, 5) THEN
PEOPLEKNOWMSM2 = 1;

*NO PLACE OF WORSHIP OR NONE;
ELSE IF SPI2 = 4 THEN
PEOPLEKNOWMSM2 = 2;

<* HALF, BUT SOME;
ELSE IF SPI2 IN (1, 2, 3) THEN
PEOPLEKNOWMSM2 = 3;

* HALF OR MORE;
*I AM ABLE TO BE OPEN ABOUT MY SEXUALITY IN MY RELIGIOUS COMMUNITY?;
IF SPI3 IN (. , .R) THEN
OPENSEXUALITY3GRP = .;
ELSE IF SPI3 = 5 THEN
OPENSEXUALITY3GRP = 1;

*< NO RELIGIOUS COMMUNITY;
ELSE IF SPI3 IN (3,4) THEN
OPENSEXUALITY3GRP = 2;

*DISAGREE OR STRONGLY DISAGREE;
ELSE IF SPI3 IN (1,2) THEN
OPENSEXUALITY3GRP = 3;

* AGREE OR STRONGLY AGREE;
RUN;

**********************************************************************
****************
**********************************************************************
**********
BEGIN SCOTT CODE

**********************************************************************
**************
September, 2012
**********************************************************************
**************
Coded by:

**********************************************************************
Scott Crawford
**********************************************************************
**************
Cell: 256-496-0209
**********************************************************************
**************
proc contents data=disdata.all_data varnum;
run;

proc freq data=disdata.all_data;
   table _all_;
run;

proc freq data=disdata.all_data;
   table ETHNICGRP * Blacksite;
run;
***BEGIN RECODE;
DATA disdata.dis1;
SET disdata.all_data;

*remove non-Black from dataset;
if rsite ne 'Black' then
  delete;

*****RISK VARIABLES;
if IP_YB = 2 then
  IP_YB_di = 0;
else if IP_YB = 1 then
  IP_YB_di = 1;
else IP_YB_di = .M;

if IP_AB = 2 then
  IP_AB_di = 0;
else if IP_AB = 1 then
  IP_AB_di = 1;
else IP_AB_di = .M;

if AUSEX_WC in (1, 2) then
  AUSEX_WC_di = 1;
else if AUSEX_WC = 3 then
  AUSEX_WC_di = 0;
else AUSEX_WC_di = .M;

*STD/STI;
if STD_EVER = 2 then
  STD_EVER_di = 0;
else if STD_EVER = 1 then
  STD_EVER_di = 1;
else STD_EVER_di = .M;

*NEWSEROSTAT;
if NEWSEROSTAT = 3 then
  HIV_TEST_VAR = 0;

*HIV Negative;
else if NEWSEROSTAT in (1, 2) then
  HIV_TEST_VAR = 1;

*HIV Positive;
else HIV_TEST_VAR = .M;

***PREDICTOR VARIABLES;
if GH4 = 1 then
  Depress_cat = 0;
else if GH4 = 2 then
  Depress_cat = 1;
else if GH4 = 3 then
Depress_cat = 2;
else if GH4 in (4, 5, 6, 7) then
    Depress_cat = 3;
else Depress_cat = .M;

if SUB1 = 2 then
    SUB1_di = 0;
else if SUB1 = 1 then
    SUB1_di = 1;
else SUB1_di = .M;

if SUB2 = 7 then
    ALC_ge5 = 0;
else if SUB2 = 1 then
    ALC_ge5 = 1;
else if SUB2 in (2, 3) then
    ALC_ge5 = 2;
else if SUB2 in (4, 5) then
    ALC_ge5 = 3;
else if SUB2 = 6 then
    ALC_ge5 = 4;
else ALC_ge5 = .M;

if SUB3 = 0 then
    SUB3_di = 0;
else if SUB3 = 1 then
    SUB3_di = 1;
else SUB3_di = .M;

if SUB4 = 0 then
    SUB4_di = 0;
else if SUB4 = 1 then
    SUB4_di = 1;
else SUB4_di = .M;

if SUB5 = 0 then
    SUB5_di = 0;
else if SUB5 = 1 then
    SUB5_di = 1;
else SUB5_di = .M;

if SUB6 = 0 then
    SUB6_di = 0;
else if SUB6 = 1 then
    SUB6_di = 1;
else SUB6_di = .M;

if SUB7 = 0 then
    SUB7_di = 0;
else if SUB7 = 1 then
    SUB7_di = 1;
else SUB7_di = .M;
if SUB8 = 2 then
    SUB8_di = 0;
else if SUB8 =1 then
    SUB8_di =1;
else SUB8_di= .M;

if SUB9 = 0 then
    SUB9_di = 0;
else if SUB9 =1 then
    SUB9_di =1;
else SUB9_di= .M;

****RELIGIOUSITY VARIABLES

**WORSHIP;

*dichotomize;
if WORSHIP= 1 then
    WORSHIP_di = 0;
else if WORSHIP in (2, 3, 4, 5) then
    WORSHIP_di =1;
else WORSHIP_di= .M;

*ordered;
if WORSHIP= 1 then
    CHURCH_ATTEND = 0;

*NEVER;
else if WORSHIP= 5 then
    CHURCH_ATTEND =1;

*SOME;
else if WORSHIP in (4, 3) then
    CHURCH_ATTEND =2;

*MONTHLY;
else if WORSHIP = 2 then
    CHURCH_ATTEND =3;

*WEEKLY;
else CHURCH_ATTEND = .M;

*MISSING;
*continuous;
if WORSHIP= 1 then
    WORSHIP_CONT = 0;

*NEVER;
else if WORSHIP= 5 then
    WORSHIP_CONT =1;
*SOME;
else if WORSHIP= 4 then
  WORSHIP_CONT =2;

*MONTHLY;
else if WORSHIP= 3 then
  WORSHIP_CONT =3;

*MONTHLY;
else if WORSHIP= 2 then
  WORSHIP_CONT =4;

*WEEKLY;
else WORSHIP_CONT =.M;

*MISSING;
*SPI3;
if SPI3= 5 then
  SPI3_CONT = 0;

*No Opinion;
else if SPI3= 1 then
  SPI3_CONT =1;

*SA;
else if SPI3= 2 then
  SPI3_CONT =2;

*A;
else if SPI3= 3 then
  SPI3_CONT =3;

*D;
else if SPI3= 4 then
  SPI3_CONT =4;

*SD;
else SPI3_CONT =.M;

*MISSING;
*SPI3 dichotomize;
if SPI3 in (3,4) then
  RELIG_OPEN = 0;

*NOT OPEN;
else if SPI3 in (1,2) then
  RELIG_OPEN = 1;

*NOT OPEN;
else RELIG_OPEN = .M;

*includes "5" and trully "missing";
*SPI4;
if SPI4= 5 then
    SPI4_CONT = 0;

*No Opinion;
else if SPI4= 1 then
    SPI4_CONT = 4;

*SA;
else if SPI4= 2 then
    SPI4_CONT = 3;

*A;
else if SPI4= 3 then
    SPI4_CONT = 2;

*D;
else if SPI4= 4 then
    SPI4_CONT = 1;

*SD;
else SPI4_CONT = .M;

*MISSING;
*Si5;
if SPI5= 5 then
    SPI5_CONT = 0;

*No Opinion;
else if SPI5= 1 then
    SPI5_CONT = 4;

*SA;
else if SPI5= 2 then
    SPI5_CONT = 3;

*A;
else if SPI5= 3 then
    SPI5_CONT = 2;

*D;
else if SPI5= 4 then
    SPI5_CONT = 1;

*SD;
else SPI5_CONT = .M;

*MISSING;
*SPIRITUALITY VARIABLES;
*Si6;
if SPI6= 5 then
    SPI6_CONT = 0;
*No Opinion;
else if SPI6= 1 then
  SPI6_CONT =4;
*SA;
else if SPI6= 2 then
  SPI6_CONT =3;
*A;
else if SPI6= 3 then
  SPI6_CONT =2;
*D;
else if SPI6= 4 then
  SPI6_CONT =1;
*SD;
else SPI6_CONT =.M;
*MISSING;
*Si7;
if SPI7= 5 then
  SPI7_CONT = 0;
*No Opinion;
else if SPI7= 1 then
  SPI7_CONT =4;
*SA;
else if SPI7= 2 then
  SPI7_CONT =3;
*A;
else if SPI7= 3 then
  SPI7_CONT =2;
*D;
else if SPI7= 4 then
  SPI7_CONT =1;
*SD;
else SPI7_CONT =.M;
*MISSING;
*Si8;
if SPI8= 5 then
  SPI8_CONT =0;
*No Opinion;
else if SPI8= 1 then
  SPI8_CONT =4;
*SA;
else if SPI8= 2 then
  SPI8_CONT =3;

*A;
else if SPI8= 3 then
  SPI8_CONT =2;

*D;
else if SPI8= 4 then
  SPI8_CONT =1;

*SD;
else SPI8_CONT =.M;

*MISSING;
run;

DATA disdata.dis2;
  SET disdata.dis1;

  *****NON PRESCRIPTION SUBSTANCE USE" = sum of (SUB 3, SUB 4, SUB 5, SUB 6, SUB 7, SUB 8, AND SUB 9);
  NP_SUB_TOTAL= sum (of SUB3_di SUB4_di SUB5_di SUB6_di SUB7_di SUB8_di SUB9_di);

  *Create Religiousltty;
  RELIGIOSITY=  sum (of WORSHIP_CONT SPI3_CONT SPI4_CONT SPI5_CONT);

  *Create Spiritualality;
  SPIRITUALITY= sum (of SPI6_CONT SPI7_CONT SPI8_CONT);
  label
    ALC_ge5 = 'ALC_ge5: [SUB2 recode] (0=NONE, 1=Daily, 2=Weekly, 3=Monthly, 4=Less than once a month'
    NP_SUB_TOTAL = 'NP_SUB_TOTAL: Non-prescription substance use total= sum of SUB3_di SUB4_di SUB5_di SUB6_di SUB7_di SUB8_di SUB9_di'
    WORSHIP_di = 'WORSHIP_di: Attended a place of worship? (1=some, 0=never)'
    CHURCH_ATTEND = 'CHURCH_ATTEND: [from WORSHIP] (0=never, 1=some, 2=monthly, 3=weekly'
    WORSHIP_CONT = 'WORSHIP_CONT: 0=None -- 4=Weekly'
    RELIG_OPEN = 'RELIG_OPEN: [from SP4] (0=NO, 1=YES)'
    RELIGIOSITY = 'RELIGIOSITY: sum of WORSHIP_CONT
    SPI3_CONT SPI4_CONT SPI5_CONT'
    SPIRITUALITY = 'SPIRITUALITY: sum of SPI6_CONT SPI7_CONT SPI8_CONT'
    SPI7_CONT SPI8_CONT'
    HIV_TEST_VAR = 'HIV_TEST_VAR: [from NEWSEROSTAT]
  0=negative, 1=positive'
run;
ods rtf file= 'E:\Research Data\SAS OUTPUT\Sas output from dis2 dataset 9_24_24.rtf';
proc contents data=disdata.dis2 varnum;
run;
proc freq data=disdata.dis2;
   table IP_YB_di IP_AB_di AUSEX_WC_di STD_EVER_di HIV_TEST_VAR Depress_cat SUB1_di ALC_ge5 SUB3_di SUB4_di SUB5_di SUB6_di SUB7_di SUB8_di SUB9_di WORSHIP_di CHURCH_ATTEND WORSHIP_CONT SPI3_CONT RELIG_OPEN SPI4_CONT SPI5_CONT SPI6_CONT SPI7_CONT SPI8_CONT NP_SUB_TOTAL RELIGIOSITY SPIRITUALITY/missing;
run;
*Template for checking recodes;
proc freq data=disdata.dis2;
   table sub3 * sub3_di/missing;
run;
proc corr data=disdata.dis2;
   var IP_YB_di IP_AB_di AUSEX_WC_di STD_EVER_di HIV_TEST_VAR Depress_cat;
   with SUB1_di ALC_ge5 SUB3_di SUB4_di SUB5_di SUB6_di SUB7_di SUB8_di SUB9_di WORSHIP_di CHURCH_ATTEND WORSHIP_CONT SPI3_CONT RELIG_OPEN SPI4_CONT SPI5_CONT SPI6_CONT SPI7_CONT SPI8_CONT NP_SUB_TOTAL RELIGIOSITY SPIRITUALITY;
run;
ods rtf close;
APPENDIX D

ByHS CODE BOOK
**M1.** How old are you? Enter the number of years.

<table>
<thead>
<tr>
<th>AGE</th>
<th>Age</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 - 96</td>
<td>range</td>
<td></td>
</tr>
<tr>
<td>98</td>
<td>Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

**DEM2A.** Were you born in one of the 50 states in the United States (not including U.S. territories like Puerto Rico or Guam)?

<table>
<thead>
<tr>
<th>PBIRTH</th>
<th>US Citizen</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>No</td>
</tr>
<tr>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>8</td>
<td>Refuse to Answer</td>
</tr>
</tbody>
</table>

**DEM2B.** Where were you born?

<table>
<thead>
<tr>
<th>DEM2B</th>
<th>Where were you born?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>North America (either Mexico or Canada)</td>
</tr>
<tr>
<td>2</td>
<td>Central America</td>
</tr>
<tr>
<td>3</td>
<td>South America</td>
</tr>
<tr>
<td>4</td>
<td>Caribbean</td>
</tr>
<tr>
<td>5</td>
<td>Africa/Middle East</td>
</tr>
<tr>
<td>6</td>
<td>Europe</td>
</tr>
<tr>
<td>7</td>
<td>Asia</td>
</tr>
<tr>
<td>8</td>
<td>Australia/South Pacific</td>
</tr>
<tr>
<td>9</td>
<td>Other</td>
</tr>
<tr>
<td>98</td>
<td>Refuse to Answer</td>
</tr>
</tbody>
</table>

**DEM3.** What is the total number of years you have been living in the continental U.S.?

<table>
<thead>
<tr>
<th>DEM3</th>
<th>Years in US</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 90</td>
<td>(Years)</td>
</tr>
<tr>
<td>98</td>
<td>Refuse to Answer</td>
</tr>
</tbody>
</table>

**DEM4LA.** How long have you been living in Los Angeles? Please enter the number of years. If you have lived in Los Angeles less than a year, please place a '01' in the 'YEARS' category below.

<table>
<thead>
<tr>
<th>DEM4LA</th>
<th>Years living in LA</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 90</td>
<td>(Years)</td>
</tr>
<tr>
<td>98</td>
<td>Refuse to Answer</td>
</tr>
</tbody>
</table>

**DEM4NYC.** How long have you been living in New York City? Please enter the number of years. If you have lived in New York City less than a year, please place a '01' in the 'YEARS' category below.

<table>
<thead>
<tr>
<th>DEM4NYC</th>
<th>Years living in NYC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 90</td>
<td>(Years)</td>
</tr>
<tr>
<td>98</td>
<td>Refuse to Answer</td>
</tr>
</tbody>
</table>
**DEM4PHIL.** How long have you been living in Philadelphia? Please enter the number of years. If you have lived in Philadelphia less than a year, please place a ‘01’ in the ‘YEARS’ category below.

- **DEM4PHIL** Years living in Philly
  - 0 - 90 = (Years)
  - 98 = Refuse to Answer

**DEM5A.** Was your father born in one of the 50 states of the United States (not including U.S. territories like Puerto Rico or Guam)?

- **FPBIRTH** Father-US Citizen
  - 2 = No
  - 1 = Yes
  - 8 = Refuse to Answer

**DEM5B.** Where was your father born?

- **DEM5B** Fathers birth place
  - 1 = North America (either Mexico or Canada)
  - 2 = Central America
  - 3 = South America
  - 4 = Caribbean
  - 5 = Africa/Middle East
  - 6 = Europe
  - 7 = Asia
  - 8 = Australia/South Pacific
  - 9 = Other
  - 98 = Refuse to Answer

**DEM6A.** Was your mother born in one of the 50 states of the United States (not including U.S. territories like Puerto Rico or Guam)?

- **MPBIRTH** Mother-US Citizen
  - 2 = No
  - 1 = Yes
  - 8 = Refuse to Answer

**DEM6B.** Where was your mother born?

- **DEM6B** Mothers birth place
  - 1 = North America (either Mexico or Canada)
  - 2 = Central America
  - 3 = South America
  - 4 = Caribbean
  - 5 = Africa/Middle East
  - 6 = Europe
  - 7 = Asia
  - 8 = Australia/South Pacific
  - 9 = Other
  - 98 = Refuse to Answer
**DEM7. Do you consider yourself to be Hispanic or Latino?**

<table>
<thead>
<tr>
<th>HISP</th>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

**DEM8. Which racial group or groups do you consider yourself to be in?**

<table>
<thead>
<tr>
<th>RACEA</th>
<th>Race: Asian</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RACEB</th>
<th>Race: Black or African American</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RACEC</th>
<th>Race: American Indian or Alaskan Native</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Yes</td>
<td></td>
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<tr>
<td>8</td>
<td>Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RACED</th>
<th>Race: Native Hawaiian or Pacific Islander</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No</td>
<td></td>
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<td>1</td>
<td>Yes</td>
<td></td>
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<td>8</td>
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</table>

<table>
<thead>
<tr>
<th>RACEE</th>
<th>Race: White</th>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>No</td>
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<tr>
<td>1</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RACEF</th>
<th>Race: None of the above</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

**DEM9. In general, what language(s) do you read and speak?**

<table>
<thead>
<tr>
<th>DEM9</th>
<th>Language- Read and speak</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Only Spanish</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Spanish more than English</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Both equally</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>English more than Spanish</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Only English</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>
DEM10. What was the language(s) you used as a child?

<table>
<thead>
<tr>
<th>VDEM10</th>
<th>Language- Used a child</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Only Spanish</td>
</tr>
<tr>
<td>2</td>
<td>Spanish more than English</td>
</tr>
<tr>
<td>3</td>
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<tr>
<td>5</td>
<td>Only English</td>
</tr>
<tr>
<td>8</td>
<td>Refuse to Answer</td>
</tr>
</tbody>
</table>

DEM11. What language(s) do you usually speak at your home?

<table>
<thead>
<tr>
<th>DEM11</th>
<th>Language- Speak at home</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Only Spanish</td>
</tr>
<tr>
<td>2</td>
<td>Spanish more than English</td>
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<tr>
<td>3</td>
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</tr>
<tr>
<td>4</td>
<td>English more than Spanish</td>
</tr>
<tr>
<td>5</td>
<td>Only English</td>
</tr>
<tr>
<td>8</td>
<td>Refuse to Answer</td>
</tr>
</tbody>
</table>

DEM12. In which language(s) do you usually think?

<table>
<thead>
<tr>
<th>DEM12</th>
<th>Language- Think</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Only Spanish</td>
</tr>
<tr>
<td>2</td>
<td>Spanish more than English</td>
</tr>
<tr>
<td>3</td>
<td>Both equally</td>
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<td>4</td>
<td>English more than Spanish</td>
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<tr>
<td>5</td>
<td>Only English</td>
</tr>
<tr>
<td>8</td>
<td>Refuse to Answer</td>
</tr>
</tbody>
</table>

DEM13LA. What language(s) do you usually speak with your friends here in Los Angeles?

<table>
<thead>
<tr>
<th>DEM13LA</th>
<th>Language - With friends in LA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Only Spanish</td>
</tr>
<tr>
<td>2</td>
<td>Spanish more than English</td>
</tr>
<tr>
<td>3</td>
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<td>4</td>
<td>English more than Spanish</td>
</tr>
<tr>
<td>5</td>
<td>Only English</td>
</tr>
<tr>
<td>8</td>
<td>Refuse to Answer</td>
</tr>
</tbody>
</table>

DEM13NYC. What language(s) do you usually speak with your friends here in New York City?

<table>
<thead>
<tr>
<th>DEM13NYC</th>
<th>Language - With friends in NYC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Only Spanish</td>
</tr>
<tr>
<td>2</td>
<td>Spanish more than English</td>
</tr>
<tr>
<td>3</td>
<td>Both equally</td>
</tr>
<tr>
<td>4</td>
<td>English more than Spanish</td>
</tr>
<tr>
<td>5</td>
<td>Only English</td>
</tr>
<tr>
<td>8</td>
<td>Refuse to Answer</td>
</tr>
</tbody>
</table>
**DEM13PHL.** What language(s) do you usually speak with your friends here in Philadelphia?

Language - With friends in Philly

1 = Only Spanish
2 = Spanish more than English
3 = Both equally
4 = English more than Spanish
5 = Only English
8 = Refuse to Answer

**DEM14.** What zip code do you live in? (Enter 99999 if unknown)

Zip Code

5 = Refuse to Answer

Calculated Variable

ZIP3 = substring(DEM14,3,1)

Calculated Variable

ZIP4 = substring(DEM14,4,1)

**DEM15.** What is the highest level of education you completed?

Education Level

1 = Did not graduate from high school
2 = Graduated from high school or GED
3 = Graduated from a technical school
4 = 2-year college degree (AA degree)
5 = 4-year college degree (BA)
6 = Masters degree (MA, MS, MPH)
7 = Doctoral degree (PhD, JD)
8 = Refuse to Answer

**DEM16.** Are you currently working?

Work Status

1 = Full time
2 = Part time/ Occasional
3 = Unemployed
4 = Retired
5 = Unable to work (disabled)
8 = Refuse to Answer

**DEM17.** Are you currently a full time or part time student?

Student Status

1 = Full time
2 = Part time
3 = Not a student
8 = Refuse to Answer
**DEM18.** Thinking about the past 12 months, how much was your total yearly income before taxes were taken out?

**DEM18** Income

1 = Less than $5,000  
2 = $5,000 - $9,999  
3 = $10,000 - $19,999  
4 = $20,000 - $29,999  
5 = $30,000 - $39,999  
6 = $40,000 - $49,999  
7 = $50,000 - $59,999  
8 = $60,000 - $69,999  
9 = $70,000 - $79,999  
10 = $80,000 or more  
98 = Refuse to Answer

**DEM19.** How many people other than yourself does your income support?

**DEM19** People supported

1 = 0  
2 = 1  
3 = 2  
4 = 3  
5 = 4 or more  
8 = Refuse to Answer

**DEM20.** During the past 12 months, how many times did you run out of money for your basic necessities like rent or food?

**DEM20** Out of Money

1 = Never  
2 = Once  
3 = Twice  
4 = Three times or more  
8 = Refuse to Answer

**DEM21.** Have you ever been arrested and taken to jail or prison?

**DEM21** Arrested

1 = Never  
2 = Once  
3 = Twice  
4 = Three times or more  
8 = Refuse to Answer
**DEM22.** What is your current legal marital status?

**DEM22**

1. Married to a female
2. Divorced
3. Widowed
4. Separated
5. Single, never been married
6. Refuse to Answer

**DEM23.** Do you think of yourself as.....

**DEM23**

1. Heterosexual or "Straight"
2. Homosexual or Gay
3. Bisexual
4. Other
5. Refuse to Answer

**DEM24.** Do you identify with any of the following terms? (Check all that apply)

**DEM24A**

1. Queer
   - 0 = No
   - 1 = Yes
   - 8 = Refuse to Answer

**DEM24B**

1. Same gender loving
   - 0 = No
   - 1 = Yes
   - 8 = Refuse to Answer

**DEM24C**

1. In the life
   - 0 = No
   - 1 = Yes
   - 8 = Refuse to Answer

**DEM24D**

1. On the 'down low'
   - 0 = No
   - 1 = Yes
   - 8 = Refuse to Answer

**DEM24E**

1. None
   - 0 = No
   - 1 = Yes
   - 8 = Refuse to Answer
Recently people have been talking more about men on the down low or DL, but this may mean different things to different people. We would like to know what DL means to you. Which of the following do you feel best describes men who are DL or on the down low? (Check all that apply):

**DEM25A** What DL means to participant: Extremely Masculine

- 0 = No
- 1 = Yes
- 98 = Refuse to Answer

**DEM25B** What DL means to participant: Always tops (men who penetrate during anal or oral sex)

- 0 = No
- 1 = Yes
- 98 = Refuse to Answer

**DEM25C** What DL means to participant: Less likely to have HIV

- 0 = No
- 1 = Yes
- 98 = Refuse to Answer

**DEM25D** What DL means to participant: Have fewer male sex partners than gay identified men

- 0 = No
- 1 = Yes
- 98 = Refuse to Answer

**DEM25E** What DL means to participant: DL only refers to Black men

- 0 = No
- 1 = Yes
- 98 = Refuse to Answer

**DEM25F** What DL means to participant: Have wives or girlfriends

- 0 = No
- 1 = Yes
- 98 = Refuse to Answer

**DEM25G** What DL means to participant: Only have male sex partners

- 0 = No
- 1 = Yes
- 98 = Refuse to Answer

**DEM25H** What DL means to participant: I don't agree with any of these

- 0 = No
- 1 = Yes
- 98 = Refuse to Answer

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DEM25I  What DL means to participant: I never heard of the term “down low” or “DL”  
0 = No  
1 = Yes  
98 = Refuse to Answer

GH1. In general, what do you consider your health to be?  
GH1  General Health  
1 = Excellent  
2 = Good  
3 = Fair  
4 = Poor  
8 = Refuse to Answer

GH2. Do you have a regular doctor or health care provider?  
GH2  Health Care Provider  
2 = No  
1 = Yes  
8 = Refuse to Answer

GH3. What kind of health insurance or medical coverage do you currently have?  
GH3  Insurance Coverage  
1 = No medical coverage  
2 = Medicaid (government insurance for people with low incomes)  
3 = Medicare (government insurance for the elderly and disabled)  
4 = Tricare, formerly known as CHAMPUS (e.g., Gov. insurance for military personnel)  
5 = Veterans Administration coverage  
6 = Private health insurance (e.g., HMO, Blue Cross, other employer-based health plan)  
8 = Refuse to Answer

GH4. In the last 3 months, approximately how many days did you feel sad or depressed for most of the day?  
GH4  Depression  
1 = Never  
2 = 1 - 2 days  
3 = 3 - 6 days  
4 = 7 - 10 days  
5 = 11 - 20 days  
6 = 21 - 30 days  
7 = over 30 days  
8 = Refuse to Answer
**STD1.** Have you ever had a sexually transmitted disease (STD)?

STD\_EVER STD ever

2 = No
1 = Yes
8 = Refuse to Answer

**STD2.** In your lifetime, have you ever been told by a health-care provider that you had a sexually transmitted disease (STD) such as gonorrhea (GC, clap), syphilis, Chlamydia, genital warts, herpes, or hepatitis B?

STD\_HCP STD diagnosed by Health Care Provider

2 = No
1 = Yes
8 = Refuse to Answer

**STD3.** Which STDs has a health care provider told you that you had? (Check all that apply)

STDA STDs: Gonorrhea (GC, Clap)

0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer

STDB STDs: Chlamydia

0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer

STDC STDs: Syphilis ("Bad blood")

0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer

STDD STDs: Genital Warts (anal, penile) (Human Papilloma Virus)

0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer

STDE STDs: Genital Herpes (anal, penile) (Herpes Simplex Virus)

0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer
**STDF** STDs: Hepatitis B

0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer

**STDG** STDs: Other

0 = No
1 = Yes
97 = Don't Know
98 = Refuse to Answer

**STD4.** When was the last time that a health care provider told you that you had an STD?

**STD4** Year of last STD

1 = Less than 1 year ago
2 = 1 - 2 years ago
3 = 3 - 4 years ago
4 = 5 - 7 years ago
5 = 8 - 10 years ago
6 = Over 10 years ago
8 = Refuse to Answer

**STD5.** Is your penis circumcised or cut?

**STD5** Circumcised

2 = No
1 = Yes
8 = Refuse to Answer

**HT1.** Have you ever been tested for HIV before today?

**HIV_TEST** Have you ever been tested for HIV before today?

2 = No
1 = Yes
8 = Refuse to Answer

**HT2.** How many times in your life have you been tested for HIV?

**HT2** Total # of HIV tests

1 - 996 = range
998 = Refuse to Answer

**HT3.** When did you have your first HIV test? (Please take your best guess at the month, if you do not remember the exact month)

**HT3** First HIV test

1/1986 - Current = mm/yyyy
2098 = Refuse to Answer (Year)
HT4. When did you have your most recent HIV test? (Please take your best guess at the month, if you do not remember the exact month)

Most recent HIV test date

1/1986 - Current = mm/yyyy
2098 = Refuse to Answer (Year)

HT5. What was the result of your most recent HIV test?

Result of most recent HIV test

1 = Negative
2 = Positive
3 = Did not get the result of the last test
4 = Indeterminate (neither positive or negative)
8 = Refuse to Answer

HT6. What are the reasons why you have not taken an HIV test prior to today? (Check all that apply)

Reasons why not tested: I'm afraid I might be HIV positive

0 = No
1 = Yes
98 = Refuse to Answer

Reasons why not tested: I'm afraid my result will be reported to the government

0 = No
1 = Yes
98 = Refuse to Answer

Reasons why not tested: I'm afraid people will think I'm gay

0 = No
1 = Yes
98 = Refuse to Answer

Reasons why not tested: I'm afraid people might treat me differently

0 = No
1 = Yes
98 = Refuse to Answer

Reasons why not tested: I don't have the time

0 = No
1 = Yes
98 = Refuse to Answer

Reasons why not tested: I can't afford it

0 = No
1 = Yes
98 = Refuse to Answer
### NOTESTG
Reasons why not tested: I can't get to test site

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
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<td>No</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>98</td>
<td>Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

### NOTESTH
Reasons why not tested: I have been practicing safe sex

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
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<td>No</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>98</td>
<td>Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

### NOTESTI
Reasons why not tested: I know my partners don't have HIV

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
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<td>No</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>98</td>
<td>Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

### NOTESTJ
Reasons why not tested: I am not at risk for HIV

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Count</th>
</tr>
</thead>
<tbody>
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<td>No</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>98</td>
<td>Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

### NOTESTK
Reasons why not tested: It is not important

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
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<td>98</td>
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<td></td>
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</table>

### NOTESTL
Reasons why not tested: I don't know where to get tested

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>98</td>
<td>Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

### NOTESTM
Reasons why not tested: My doctor never recommended I get an HIV test

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>98</td>
<td>Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

### NOTESTN
Reasons why not tested: Other

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>98</td>
<td>Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

### HT7.
When did you first test positive for HIV?

**HT7** Date of first positive HIV test

- **12/1983** - **Current** = mm/yyyy
- **2098** = Refuse to Answer (Year)
**HT8.** How likely is it that you are infected with HIV now? (Click on a number)

   HT8  Likely to be HIV infected today

   1 = extremely unlikely
   2 - 9 = unlabelled scale points
   10 = extremely likely
   98 = Refuse to Answer

**HT9.** How likely do you think it is that you will become infected with HIV in your lifetime? (Click on a number)

   HT9  Likely to be HIV infected in lifetime

   1 = extremely unlikely
   2 - 9 = unlabelled scale points
   10 = extremely likely
   98 = Refuse to Answer

**SA1.** How old were you when you first had anal sex with a male?

   SA1  How old were you when you first had sex with a male?

   1 = Never had anal sex with a man
   2 = Less than 13 years old
   3 = 13 to 15 years old
   4 = 16 to 18 years old
   5 = 19 to 21 years old
   6 = 22 to 25 years old
   7 = Older than 25 years old
   8 = Refuse to Answer

**SA2.** How old were you when you first had vaginal or anal sex with a female?

   SA2  Age at first sex with a female?

   1 = Never had vaginal or anal sex with a female
   2 = Less than 13 years old
   3 = 13 to 15 years old
   4 = 16 to 18 years old
   5 = 19 to 21 years old
   6 = 22 to 25 years old
   7 = Older than 25 years old
   8 = Refuse to Answer

**SA3.** How important would your close male friends say it is to use a condom when having anal sex with a man?

   SA3  Freq. close male friends use condoms with male partners

   1 = Very important
   2 = Somewhat important
   3 = A little important
   4 = Not at all important
   5 = They do not have anal sex with men
   8 = Refuse to Answer
SA4. How important would your close male friends say it is to use a condom when having anal or vaginal sex with a woman?

<table>
<thead>
<tr>
<th>Freq, close male friends use condoms with female partners</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = Very important</td>
<td></td>
</tr>
<tr>
<td>2 = Somewhat important</td>
<td></td>
</tr>
<tr>
<td>3 = A little important</td>
<td></td>
</tr>
<tr>
<td>4 = Not at all important</td>
<td></td>
</tr>
<tr>
<td>5 = They do not have anal or vaginal sex with women</td>
<td></td>
</tr>
<tr>
<td>8 = Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

SA5. At any time during the past three months, have you been in a committed relationship with another man (this could be a lover or boyfriend)?

<table>
<thead>
<tr>
<th>committed relationship in last 3 months</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = Yes, with 1 man</td>
<td></td>
</tr>
<tr>
<td>2 = Yes, with more than 1 man</td>
<td></td>
</tr>
<tr>
<td>3 = No</td>
<td></td>
</tr>
<tr>
<td>8 = Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

SA6. Are you currently in a committed relationship with a man?

<table>
<thead>
<tr>
<th>Committed relationship currently</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = Yes, with 1 man</td>
<td></td>
</tr>
<tr>
<td>2 = Yes, with more than 1 man</td>
<td></td>
</tr>
<tr>
<td>3 = No</td>
<td></td>
</tr>
<tr>
<td>8 = Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

SA7. How long were you in or have been in this relationship? (Choose one)

<table>
<thead>
<tr>
<th>Time in this relationship?</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = Less than 6 months</td>
<td></td>
</tr>
<tr>
<td>2 = 6-11 months</td>
<td></td>
</tr>
<tr>
<td>3 = 1-2 years</td>
<td></td>
</tr>
<tr>
<td>4 = 3-4 years</td>
<td></td>
</tr>
<tr>
<td>5 = 5 or more years</td>
<td></td>
</tr>
<tr>
<td>8 = Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

SA8. How old is he?

<table>
<thead>
<tr>
<th>Age of Lover</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = Less than 16</td>
<td></td>
</tr>
<tr>
<td>2 = 16-20</td>
<td></td>
</tr>
<tr>
<td>3 = 21-25</td>
<td></td>
</tr>
<tr>
<td>4 = 26-30</td>
<td></td>
</tr>
<tr>
<td>5 = 31-35</td>
<td></td>
</tr>
<tr>
<td>6 = 36-40</td>
<td></td>
</tr>
<tr>
<td>7 = 41-50</td>
<td></td>
</tr>
<tr>
<td>8 = Over 50</td>
<td></td>
</tr>
<tr>
<td>98 = Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>
SA9. Which racial/ethnic group or groups best describes him? (Check all that apply)

SA9A Race of Lover: Asian
0 = No
1 = Yes
8 = Refuse to Answer

SA9B Race of Lover: American Indian or Alaskan Native
0 = No
1 = Yes
8 = Refuse to Answer

SA9C Race of Lover: Black or African American
0 = No
1 = Yes
8 = Refuse to Answer

SA9D Race of Lover: Latino or Hispanic
0 = No
1 = Yes
8 = Refuse to Answer

SA9E Race of Lover: Native Hawaiian or Pacific Islander
0 = No
1 = Yes
8 = Refuse to Answer

SA9F Race of Lover: White
0 = No
1 = Yes
8 = Refuse to Answer

SA10. Did you live together at any time during the past 3 months?
SA10 Lived with lover in past 3 months
2 = No
1 = Yes
8 = Refuse to Answer

SA11. In the past 3 months, did he help pay for any of the bills, food, or other expenses?
SA11 Lover helped with expenses in past 3 months
1 = He didn't pay for any of the expenses
2 = Less than half of the expenses
3 = About half of the expenses
4 = More than half of the expenses
5 = He paid for all of the expenses
8 = Refuse to Answer
### SA12. In the past 3 months, did you put your penis in his butt?

**ANAL_3MO** Anal Sex in Past 3 months

1. **2** = No
2. **1** = Yes
3. **8** = Refuse to Answer

### SA13. In the past 3 months, how often was a condom used when you put your penis in his butt?

**CR_CUSE** Condoms during anal sex (penetration) in past 3 months

1. **1** = Always
2. **2** = More than half the time
3. **3** = About half the time
4. **4** = Less than half the time
5. **5** = Never
6. **8** = Refuse to Answer

### SA13a. In the past 3 months, did he put his penis in your butt?

**CR_REC** Anal sex (receiver) in past 3 months

1. **2** = No
2. **1** = Yes
3. **8** = Refuse to Answer

### SA13b. In the past 3 months, how often was a condom used when he put his penis in your butt?

**CRECUSE** Condoms during anal sex (penetration) in past 3 months

1. **1** = Always
2. **2** = More than half the time
3. **3** = About half the time
4. **4** = Less than half the time
5. **5** = Never
6. **8** = Refuse to Answer

### SA14. What is his current HIV status?

**HIVSTATL** HIV Status of Lover

1. **1** = He has HIV
2. **2** = He does not have HIV
3. **3** = Don't know/unsure
4. **8** = Refuse to Answer

### SA15. Could you tell me what you think his HIV status is?

**SA15** Think HIV Status is

1. **1** = He has HIV
2. **2** = He does not have HIV
3. **8** = Refuse to Answer
<table>
<thead>
<tr>
<th>Question</th>
<th>Description</th>
<th>Code</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA16A</td>
<td>Learned of Lovers HIV status: He told me directly</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>SA16B</td>
<td>Learned of Lovers HIV status: I guessed based on other things he has talked about</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>SA16C</td>
<td>Learned of Lovers HIV status: I guessed based on things I had seen in his home</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>SA16D</td>
<td>Learned of Lovers HIV status: Someone else told me</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>SA16E</td>
<td>Learned of Lovers HIV status: His physical appearance</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>SA16F</td>
<td>Learned of Lovers HIV status: We got tested together</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>SA16G</td>
<td>Learned of Lovers HIV status: I saw his test results</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>SA16H</td>
<td>Learned of Lovers HIV status: I went with him to get his test results</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>SA16I</td>
<td>Learned of Lovers HIV status: Other</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
SA17. Does he know your HIV status?

HIVSTATK  Does he know your HIV status?
1 = Yes
2 = No
3 = Don't know/unsure
8 = Refuse to Answer

SA18. How did he learn your HIV status? (Check all that apply)

SA18A  How did he learn your HIV status?: I told him directly
0 = No
1 = Yes
8 = Refuse to Answer

SA18B  How did he learn your HIV status?: Someone else told him
0 = No
1 = Yes
8 = Refuse to Answer

SA18C  How did he learn your HIV status?: We got tested together
0 = No
1 = Yes
8 = Refuse to Answer

SA18D  How did he learn your HIV status?: He saw my test results
0 = No
1 = Yes
8 = Refuse to Answer

SA18E  How did he learn your HIV status?: He went with me to get my test results
0 = No
1 = Yes
8 = Refuse to Answer

SA18F  How did he learn your HIV status?: Other
0 = No
1 = Yes
8 = Refuse to Answer

SA19. Not counting the man you have just told me about, did you have anal sex with another male in the last 3 months? (Do not count men who have used hormones to help them become women or had surgery to give them breasts or a vagina).

AI_WAM  Anal sex with another male
2 = No
1 = Yes
8 = Refuse to Answer
SA20. Did you have anal sex with a male in the past 3 months? (Do not count men who have used hormones to help them become women or had surgery to give them breasts or a vagina).

\[ AI_{WM} \]

- Anal sex with a male with a male in past 3 months
- 2 = No
- 1 = Yes
- 8 = Refuse to Answer

SA21. In the past 3 months, did you put your penis in another man's butt without using a condom?

\[ IP_{AB} \]

- In the past 3 months, did you put your penis in another man's butt without using a condom?
- 2 = No
- 1 = Yes
- 8 = Refuse to Answer

SA22. With how many different men did you put your penis in their butt without using a condom in the past 3 months?

\[ OMPYPBWC \]

- With how many different men did you put your penis in their butt without using a condom in the past 3 months?
- 2 = range
- 98 = Refuse to Answer

SA23. At any time before having sex, how many of these [Response to SA22] men actually told you they were HIV-negative and you had no reason to doubt it?

\[ SA23 \]

- Number told you they were HIV-negative w/ no reason to doubt
- 2 = range
- 98 = Refuse to Answer

SA24. At any time before having sex, how many of these [Response to SA22] men did you know were HIV-positive?

\[ SA24 \]

- How many of these men did you know were HIV-positive?
- 2 = range
- 98 = Refuse to Answer

SA25. How many of these [Response to SA22] men were you not completely sure of their HIV status when you were having sex?

\[ SA25 \]

- How many of these men did you not know their HIV status at all?
- 2 = range
- 98 = Refuse to Answer

SA26. In the past 3 months, did a man put his penis in your butt without using a condom?

\[ IP_{YB} \]

- In the past 3 months, did a man put his penis in your butt without using a condom?
- 2 = No
- 1 = Yes
- 8 = Refuse to Answer
SA27. How many different men put their penis in your butt without using a condom in the past 3 months?

OMPPOPBWC How many different men put their penis in your butt without using a condom in the past 3 months?

1 - 96 = range
98 = Refuse to Answer

SA28. At any time before having sex, how many of these [Response to SA27] men actually told you they were HIV-negative and you had no reason to doubt it?

SA28 How many of these men did you told you they were HIV-negative w/no reason to doubt

0 - 96 = range

SA29. At any time before having sex, how many of these [Response to SA27] men did you know were HIV-positive?

SA29 How many of these men did you know were HIV-positive?

0 - 96 = range
98 = Refuse to Answer

SA30. How many of these [Response to SA27] men were you not completely sure of their HIV status when you were having sex?

SA30 How many of these men did you not know their HIV status?

0 - 96 = range
98 = Refuse to Answer

SA30a. Douching is spraying water or a solution into your butt to clean your inside. Do you douche before or after someone puts their penis in your butt without using a condom?

DOUCHE Douche when no condom used

1 = Always
2 = More than half the time
3 = About half the time
4 = Less than half the time
5 = Never
8 = Refuse to Answer

SA31. In the past three months, did you have anal sex with any male sex partners because they gave you drugs, money, a place to stay, or other things you needed?

CSFORMDH In the past three months, did you have anal sex with any casual male sex partners because they gave you drugs, money, a place to stay, or other things you needed?

1 = Yes, only with one man
2 = Yes, with more than one man
3 = No
8 = Refuse to Answer
**SA32.** How often was a condom used when you had anal sex with a man who gave you drugs, money, or other things you needed?

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Every time</td>
</tr>
<tr>
<td>2</td>
<td>More than half the time</td>
</tr>
<tr>
<td>3</td>
<td>About half the time</td>
</tr>
<tr>
<td>4</td>
<td>Less than half the time</td>
</tr>
<tr>
<td>5</td>
<td>Never</td>
</tr>
<tr>
<td>8</td>
<td>Refuse to Answer</td>
</tr>
</tbody>
</table>

**SA33.** In the past three months, did you give another man drugs, money, a place to stay, or other things so that he would have anal sex with you?

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes, only with one man</td>
</tr>
<tr>
<td>2</td>
<td>Yes, with more than one man</td>
</tr>
<tr>
<td>3</td>
<td>No</td>
</tr>
<tr>
<td>8</td>
<td>Refuse to Answer</td>
</tr>
</tbody>
</table>

**SA34.** How often was a condom used when you had anal sex with a man who you gave drugs, money or other things he needed?

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Every time</td>
</tr>
<tr>
<td>2</td>
<td>More than half the time</td>
</tr>
<tr>
<td>3</td>
<td>About half the time</td>
</tr>
<tr>
<td>4</td>
<td>Less than half the time</td>
</tr>
<tr>
<td>5</td>
<td>Never</td>
</tr>
<tr>
<td>8</td>
<td>Refuse to Answer</td>
</tr>
</tbody>
</table>

**SA35.** Have you had anal or vaginal intercourse with a male-to-female transgender in the past 3 months?

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
</tr>
<tr>
<td>8</td>
<td>Refuse to Answer</td>
</tr>
</tbody>
</table>

**SA36.** In the past 3 months, with how many transgender persons did you put your penis in their butt without using a condom?

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Range (0-96)</td>
</tr>
<tr>
<td>8</td>
<td>Refuse to Answer</td>
</tr>
</tbody>
</table>
SA37. In the past 3 months, how many transgender persons put their penis in your butt without using a condom?

SA37  In the past 3 months, how many transgender persons put their penis in your butt without using a condom?  2

0 - 96 = range
98 = Refuse to Answer

SA38. In the past 3 months, with how many transgender persons did you put your penis in their vagina without using a condom?

SA38  In the past 3 months, with how many transgender persons did you put your penis in their vagina without using a condom?  2

0 - 96 = range
98 = Refuse to Answer

SA39. In the past 3 months, did you have anal sex without a condom with any casual male sex partners?

AUSEX_WC  In the past 3 months, did you have anal sex without a condom with any casual male sex partners?  1

1 = Yes, only with one man
2 = Yes, with more than one man
3 = No
8 = Refuse to Answer

SA40. In the past 3 months, where did you have anal sex with these men without using a condom? (Check all that apply)

SA40A  In the past 3 months, where did you have anal sex with these men without using a condom?: My home  1

0 = No
1 = Yes
98 = Refuse to Answer

SA40B  In the past 3 months, where did you have anal sex with these men without using a condom?: Other person's home  1

0 = No
1 = Yes
98 = Refuse to Answer

SA40C  In the past 3 months, where did you have anal sex with these men without using a condom?: A hotel or motel  1

0 = No
1 = Yes
98 = Refuse to Answer

SA40D  In the past 3 months, where did you have anal sex with these men without using a condom?: A bar/backroom/night club  1

0 = No
1 = Yes
98 = Refuse to Answer
**SA40E**  In the past 3 months, where did you have anal sex with these men without using a condom?: A bathhouse/sex club

- 0 = No
- 1 = Yes
- 98 = Refuse to Answer

**SA40F**  In the past 3 months, where did you have anal sex with these men without using a condom?: An adult/porn bookstore

- 0 = No
- 1 = Yes
- 98 = Refuse to Answer

**SA40G**  In the past 3 months, where did you have anal sex with these men without using a condom?: A public bathroom/rest area/park

- 0 = No
- 1 = Yes
- 98 = Refuse to Answer

**SA40H**  In the past 3 months, where did you have anal sex with these men without using a condom?: A gym

- 0 = No
- 1 = Yes
- 98 = Refuse to Answer

**SA40I**  In the past 3 months, where did you have anal sex with these men without using a condom?: A sex party in a house/hotel

- 0 = No
- 1 = Yes
- 98 = Refuse to Answer

**SA40J**  In the past 3 months, where did you have anal sex with these men without using a condom?: Public transportation area (subway or train station)

- 0 = No
- 1 = Yes
- 98 = Refuse to Answer

**SA40K**  In the past 3 months, where did you have anal sex with these men without using a condom?: The street (alleyway, parking lot)

- 0 = No
- 1 = Yes
- 98 = Refuse to Answer

**SA40L**  In the past 3 months, where did you have anal sex with these men without using a condom?: In a car

- 0 = No
- 1 = Yes
- 98 = Refuse to Answer
**SA41.** Where did you first meet casual male sex partners with whom you had anal sex without using a condom? (Check all that apply)

<table>
<thead>
<tr>
<th><strong>SA41A</strong></th>
<th>Where did you first meet casual male sex partners you had anal sex without a condom?: Internet chat rooms or sex sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = No</td>
<td>1 = Yes</td>
</tr>
<tr>
<td>98 = Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>SA41B</strong></th>
<th>Where did you first meet casual male sex partners you had anal sex without a condom?: A telephone chat line</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = No</td>
<td>1 = Yes</td>
</tr>
<tr>
<td>98 = Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>SA41C</strong></th>
<th>Where did you first meet casual male sex partners you had anal sex without a condom?: A personal ad in a newspaper or magazine</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = No</td>
<td>1 = Yes</td>
</tr>
<tr>
<td>98 = Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>SA41D</strong></th>
<th>Where did you first meet casual male sex partners you had anal sex without a condom?: A gay bar or club</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = No</td>
<td>1 = Yes</td>
</tr>
<tr>
<td>98 = Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>SA41E</strong></th>
<th>Where did you first meet casual male sex partners you had anal sex without a condom?: A straight bar or club</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = No</td>
<td>1 = Yes</td>
</tr>
<tr>
<td>98 = Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>SA41F</strong></th>
<th>Where did you first meet casual male sex partners you had anal sex without a condom?: At a party (not a sex party)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = No</td>
<td>1 = Yes</td>
</tr>
<tr>
<td>98 = Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>SA41G</strong></th>
<th>Where did you first meet casual male sex partners you had anal sex without a condom?: At a sex party</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = No</td>
<td>1 = Yes</td>
</tr>
<tr>
<td>98 = Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>SA41H</strong></th>
<th>Where did you first meet casual male sex partners you had anal sex without a condom?: At a bath house</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = No</td>
<td>1 = Yes</td>
</tr>
<tr>
<td>98 = Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>
SA41I  Where did you first meet casual male sex partners you had anal sex without a condom?: At a bookstore 1
   0 = No
   1 = Yes
   98 = Refuse to Answer

SA41J  Where did you first meet casual male sex partners you had anal sex without a condom?: At a public park or restroom 1
   0 = No
   1 = Yes
   98 = Refuse to Answer

SA41K  Where did you first meet casual male sex partners you had anal sex without a condom?: On the street 1
   0 = No
   1 = Yes
   98 = Refuse to Answer

SA41L  Where did you first meet casual male sex partners you had anal sex without a condom?: Someplace else 1
   0 = No
   1 = Yes
   98 = Refuse to Answer

SS1.  There is no one I can talk to about the important decisions in my life.
SS1  There is no one I can talk to about the important decisions in my life. 1
   1 = Strongly agree
   2 = Agree somewhat
   3 = Disagree somewhat
   4 = Strongly disagree
   8 = Refuse to Answer

SS2.  I have someone who gives me advice when I'm confused or need to sort things out.
SS2  I have someone who gives me advice when I'm confused or need to sort things out. 1
   1 = Strongly agree
   2 = Agree somewhat
   3 = Disagree somewhat
   4 = Strongly disagree
   8 = Refuse to Answer
**SS3.** I feel no one respects who I am.

SS3 I feel no one respects who I am.

<table>
<thead>
<tr>
<th></th>
<th>Strongly agree</th>
<th>Agree somewhat</th>
<th>Disagree somewhat</th>
<th>Strongly disagree</th>
<th>Refuse to Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>8</td>
</tr>
</tbody>
</table>

**SS4.** I have people who accept me as I am.

SS4 I have people who accept me as I am.

<table>
<thead>
<tr>
<th></th>
<th>Strongly agree</th>
<th>Agree somewhat</th>
<th>Disagree somewhat</th>
<th>Strongly disagree</th>
<th>Refuse to Answer</th>
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<td>4</td>
<td>8</td>
</tr>
</tbody>
</table>

**SS5.** No one really understands my most private worries and fears.

SS5 No one really understands my most private worries and fears.

<table>
<thead>
<tr>
<th></th>
<th>Strongly agree</th>
<th>Agree somewhat</th>
<th>Disagree somewhat</th>
<th>Strongly disagree</th>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>8</td>
</tr>
</tbody>
</table>

**SS6.** If I was going through a hard time, I have someone who would be right there with me.

SS6 If I was going through a hard time, I have someone who would be right there with me.

<table>
<thead>
<tr>
<th></th>
<th>Strongly agree</th>
<th>Agree somewhat</th>
<th>Disagree somewhat</th>
<th>Strongly disagree</th>
<th>Refuse to Answer</th>
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<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>8</td>
</tr>
</tbody>
</table>

**SS7.** If I was sick in bed, I have someone who would help take care of me.

SS7 If I was sick in bed, I have someone who would help take care of me.

<table>
<thead>
<tr>
<th></th>
<th>Strongly agree</th>
<th>Agree somewhat</th>
<th>Disagree somewhat</th>
<th>Strongly disagree</th>
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<tbody>
<tr>
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<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>8</td>
</tr>
</tbody>
</table>
SS8. There is no one I can depend on to lend me $50 if I needed it for an emergency.

SS8  There is no one I can depend on to lend me $50 if I needed it for an emergency.

1 = Strongly agree
2 = Agree somewhat
3 = Disagree somewhat
4 = Strongly disagree
8 = Refuse to Answer

SS9. I often feel isolated and alone.

SS9  I often feel isolated and alone.

1 = Strongly agree
2 = Agree somewhat
3 = Disagree somewhat
4 = Strongly disagree
8 = Refuse to Answer

SS10. I have someone who visits, calls or emails me just to see how I am doing.

SS10  I have someone who visits, calls or emails me just to see how I am doing.

1 = Strongly agree
2 = Agree somewhat
3 = Disagree somewhat
4 = Strongly disagree
8 = Refuse to Answer

SS11. No one needs me to take care of them.

SS11  No one needs me to take care of them.

1 = Strongly agree
2 = Agree somewhat
3 = Disagree somewhat
4 = Strongly disagree
8 = Refuse to Answer

SS12. I often provide advice and support to my family and friends.

SS12  I often provide advice and support to my family and friends.

1 = Strongly agree
2 = Agree somewhat
3 = Disagree somewhat
4 = Strongly disagree
8 = Refuse to Answer

ATT10. How much does praying to God reduce a man’s risk of getting HIV?

1 = A lot
2 = Somewhat
3 = A little
4 = Not at all
8 = Refuse to Answer
SPI1. How often have you attended a place of worship (e.g., church, temple, mosque) during the past 6 months other than for a wedding or funeral?

WORSHIP

1 = Never
2 = Once a week
3 = 2-3 times a month
4 = Once a month
5 = Less than once a month
8 = Refuse to Answer

SPI2. Of the people that you know at the place you worship, approximately how many are aware that you have sex with men?

SPI2

1 = All
2 = More than half
3 = About half
4 = Less than half
5 = None
8 = Refuse to Answer

SPI3. I am able to be open about my sexuality in my religious community.

SPI3

1 = Strongly agree
2 = Agree somewhat
3 = Disagree somewhat
4 = Strongly disagree
5 = I don't have a religious community
8 = Refuse to Answer

SPI4. My religious beliefs make me feel bad about having sex with other men.

SPI4

1 = Strongly agree
2 = Agree somewhat
3 = Disagree somewhat
4 = Strongly disagree
5 = I don't have religious beliefs
8 = Refuse to Answer

SPI5. I often have to choose my religious beliefs over my desire to be with a man.

SPI5

1 = Strongly agree
2 = Agree somewhat
3 = Disagree somewhat
4 = Strongly disagree
5 = I don't have religious beliefs
8 = Refuse to Answer
SPI6. I always seek guidance from a higher power in times of need.

1 = Strongly agree
2 = Agree somewhat
3 = Disagree somewhat
4 = Strongly disagree
5 = I don't believe in a higher power
8 = Refuse to Answer

SPI7. My spiritual connection with a higher power helps me cope with negative beliefs that other people have about homosexuality.

1 = Strongly agree
2 = Agree somewhat
3 = Disagree somewhat
4 = Strongly disagree
5 = I don't have any spiritual connection with a higher power
8 = Refuse to Answer

SPI8. My spiritual beliefs encourage me to do everything that I can to stay healthy.

1 = Strongly agree
2 = Agree somewhat
3 = Disagree somewhat
4 = Strongly disagree
5 = I don't have any spiritual beliefs
8 = Refuse to Answer

SUB1. Did you use alcohol in the past 3 months?

2 = No
1 = Yes
8 = Refuse to Answer

SUB2. During the past 3 months, how often did you have 5 or more drinks of alcohol in a row or within a couple of hours?

1 = Daily
2 = A few times a week
3 = About once a week
4 = 2-3 times a month
5 = About once a month
6 = Less than once a month
7 = Not at all
8 = Refuse to Answer
<table>
<thead>
<tr>
<th>SUB3.</th>
<th>Did you use Crystal Meth (Ice or Tina) in the past 3 months?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SUB3</strong></td>
<td>Did you use Speed, Tina, Crystal Meth, or Ice in the past 3 months?</td>
</tr>
<tr>
<td>2 = No</td>
<td></td>
</tr>
<tr>
<td>1 = Yes</td>
<td></td>
</tr>
<tr>
<td>8 = Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUB4.</th>
<th>Did you use cocaine (powder, blow, coke) in the past 3 months?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SUB4</strong></td>
<td>Did you use cocaine alone (powder, blow, coke) in the past 3 months?</td>
</tr>
<tr>
<td>2 = No</td>
<td></td>
</tr>
<tr>
<td>1 = Yes</td>
<td></td>
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</tbody>
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<table>
<thead>
<tr>
<th>SUB5.</th>
<th>Did you use crack (freebase/hubby) in the past 3 months?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SUB5</strong></td>
<td>Did you use crack (freebase/hubby) in the past 3 months?</td>
</tr>
<tr>
<td>2 = No</td>
<td></td>
</tr>
<tr>
<td>1 = Yes</td>
<td></td>
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<tr>
<td>8 = Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUB6.</th>
<th>Did you use marijuana (pot, weed, trees, buddah, grass, ganja) in the past 3 months?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SUB6</strong></td>
<td>Did you use marijuana (pot, weed, hashish, grass, ganja) in the past 3 months?</td>
</tr>
<tr>
<td>2 = No</td>
<td></td>
</tr>
<tr>
<td>1 = Yes</td>
<td></td>
</tr>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUB7.</th>
<th>Did you use heroin (smack, H, horse) in the past 3 months?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SUB7</strong></td>
<td>Did you use heroin (smack, H, horse) in the past 3 months?</td>
</tr>
<tr>
<td>2 = No</td>
<td></td>
</tr>
<tr>
<td>1 = Yes</td>
<td></td>
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<tr>
<td>8 = Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUB8.</th>
<th>Did you use poppers (rush, amyl nitrite) in the past 3 months?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SUB8</strong></td>
<td>Did you use poppers (rush, amyl nitrate) in the past 3 months?</td>
</tr>
<tr>
<td>2 = No</td>
<td></td>
</tr>
<tr>
<td>1 = Yes</td>
<td></td>
</tr>
<tr>
<td>8 = Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUB9.</th>
<th>Did you use ecstasy (E), GHB (G), or special K (ketamine or K) in the past 3 months?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SUB9</strong></td>
<td>Did you use ecstasy, GHB, or special K (ketamine) in the past 3 months?</td>
</tr>
<tr>
<td>2 = No</td>
<td></td>
</tr>
<tr>
<td>1 = Yes</td>
<td></td>
</tr>
<tr>
<td>8 = Refuse to Answer</td>
<td></td>
</tr>
</tbody>
</table>