

SEXUAL HEALTH IN HIV-INFECTED MEN

By

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William L. Jeffries IV

I dedicate this work to all those we have lost to AIDS.

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Abstract of Thesis Presented to the Graduate School
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The purpose of this thesis is to explore sexual health outcomes within a sample of HIV-infected men. Much of the extant research on sexual health within this population has been solely focused on sexual risk and disease transmission. While these topics are of critical importance, they provide very limited insight into the meanings of sexuality and contexts in which sexual interactions occur for HIV-infected men. In this thesis, I address sexuality as being normative to HIV-infected men's existence and critical to their perceptions of themselves along lines of age, race/ethnicity, gender, and sexual orientation. I specifically examine the role of sociodemographic, health-related, and substance use correlates in the distribution of sexual health outcomes for this sample.

I analyze baseline, 12-month, and 24-month data collected as part of a prospective cohort study entitled, "Predictors of Outcomes in HIV-Infected Men." I use four self-reported indicators of sexual health: sexual activity, erectile function, sexual drive, and sex life satisfaction. Bivariate analyses are conducted to measure aggregate change for both cross-sectional and longitudinal phases. For longitudinal analyses, however, I utilize transition matrices in order to depict individual-level change.

Analyses indicate that indicators of sexual health are consistently related to one another. At the individual-level, sexual health change is not likely for the majority of men. When change occurs, it tends to be negative change. This pattern is consistent across sexual health indicators, despite men with worse sexual health outcomes being lost to attrition. Men who experience better sexual health are those who are younger, cohabiting, heterosexual, physically and mentally healthier, and moderately using chemical substances. These patterns are also consistent over time.

I conclude by articulating the role of sexual health correlates in the distribution of sexual health outcomes. I also discuss implications of this study for clinical and public health practitioners who work with populations of HIV-infected men.

CHAPTER 1 INTRODUCTION

In the age of highly active antiretroviral therapies (HAART), sexual health in human immunodeficiency virus (HIV)-infected men has emerged as an area of concern for both biomedical and social scientists researching this population. Sexuality and sexual health were inevitably of less importance during the time when HIV guaranteed HIV-infected persons certain death (Cusick and Rhodes 2000). Advances in HIV treatment have not only accounted for considerable longevity for HIV-infected men, but they have also raised concerns regarding the future prevalence of HIV in the United States (Schiltz and Sandfort 2000). The increased longevity and health of HIV-infected men mean that more men remain engaged in normative daily life, including sex and sexual relationships.

Given the potential for improved health-related quality of life (QOL) that these men now face, many are concerned about an upsurge in HIV incidence due to sexual attitudes and behaviors becoming more lax in terms of prevention (Cusick and Rhodes 2000; Wolitski et al. 2001). Some, for example, comment that sexual risk behaviors, particularly among gay and bisexual HIV-infected men, are increasing because these men may perceive HIV to be a manageable chronic condition (Bailey and Hart 2005). Others outright question goals of “condoms every time” prevention messages (Kippax 2002). Upon such intervention protocols, some populations of HIV-infected men have become exhausted (Halkitis, Wolitski, and Gomez 2005). It is clear that many HIV-infected men continue to be sexual and care about a satisfying sexual life.

This thesis explores sexual health outcomes in HIV-infected men. Much of the prior research that has examined sexual health within this population focused on disease transmission and prevention. While both are important public health topics, little research has examined

sexual health within the broader context of QOL. By understanding the dynamic nature of sexual experiences and the quality of these experiences for HIV-infected men, we can gain much insight into the complexity of health and, importantly, disease transmission. It is my goal to outline the importance of sexual health within this very vulnerable population.

I analyze data from a prospective, cohort study of HIV-infected men who live in North-Central Florida. I use several indicators of sexual health: sexual activity, erectile function, sexual drive, and sex life satisfaction, all of which are gathered through self-reports. One benefit these indicators is that they provide insight into the objective nature of sexual health. They simultaneously highlight the subjective perception of the men's sexual experiences. In my analyses, I describe the sexual health of the sample, examine correlates of the sexual health indicators, and analyze changes in sexual health over time.

My analyses reveal that sexuality and sexual relationships form a key domain of everyday life among HIV-infected men. Many of the men are engaging in sexual activities and, as a whole, have only mild erectile dysfunction. They also report moderate levels of sexual drive and satisfaction with their sex lives. Remarkable stability in sexual behavior exists across the 24-month observational period. In addition, there is appreciable stability in physical performance, sexual drive, and satisfaction with their sex lives. The modest changes observed reveal declining sexual health. At both cross-sectional and longitudinal phases of analysis, sexual health is positively associated with youth, cohabitation with a sexual partner, avoiding HIV by way of homosexual contact, good physical and mental health, and, to a lesser extent, moderate substance use.

I advise clinical and public health practitioners to be aware that sexual activity is a reality for a substantial number of HIV-infected men. I outline key factors that may be implicated in

declining sexual health over time. I also follow suit with other sexual health researchers by offering ways to increase sexual health among HIV-infected men. I especially caution practitioners to be attentive to issues of age, health, sexual orientation, and substance use as these variables play key roles in the distribution of HIV and sexual health outcomes among HIV-infected men.

In the following chapter, I provide the rationale for this undertaking. Here, I define sexual health and its relevance for the population of HIV-infected men in the United States. I also delineate sociodemographic, health-related, and substance-use correlates, which prior clinical and population-based studies have found to be of significance for these men. In Chapter 3, I describe the data and the methodology used to assess sexual health and changes in sexual health. Chapter 4 contains the results of my analyses in the form of text and tables. I begin this chapter by describing the univariate nature of the sample. I describe associations between sexual health indicators, and I explain the ways in which sexual health indicators are associated with other correlates. This chapter also includes depictions of how sexual health changes over time. The final chapter concludes with a discussion on the relevance of sexual health correlates and change in sexual health. I end by offering implications of this study to health professionals working with HIV-infected men.

CHAPTER 2 BACKGROUND AND SIGNIFICANCE

This chapter provides the conceptual framework and rationale that guide the project. I draw on a host of literature that is relevant to the study of sexual health in populations of HIV-infected men. A number of these sources are drawn from sociology and public health. Others are taken from psychology and the biomedical sciences. It is this synthesis that highlights the need to study sexual health of HIV-infected men. I conclude by specifying the research questions to be addressed.

The Importance of Sexual Health

Sexual health is a complex, multi-dimensional concept that encompasses a variety of phenomena related to both sexuality and physical and socioemotional well-being (Sandfort 2006). The World Health Organization (n.d.; as cited in Sandfort 2006:224) states that:

Sexual health is a state of physical, emotional, mental and social well-being related to sexuality; it is not merely the absence of disease, dysfunction or infirmity. Sexual health requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence. For sexual health to be attained and maintained, the sexual rights of all persons must be respected, protected and fulfilled.

Within this broad definition of sexual health include topics such as sexual activity, function, drive, and satisfaction, all of which are extensively explored in this thesis.

As a critical dimension of men's well-being, sexual health can have grave consequences for men's health and survivorship. For example, the presence of a sexually transmitted infection (STI) can adversely affect the ability to have healthy sexual relationships and, subsequently, serve as a precursor to mental and emotional problems (Laumann and Michael 2001). In addition, STIs can cause sterility or have negative impacts on the birth of a child (Laumann et al. 1994).

The most salient consequence is risk of HIV/AIDS, which in the United States and throughout the world is primarily transmitted by way of sexual contact (World Health Organization 2005). To place it in the proper health context, HIV/AIDS has reached pandemic proportions, affecting every nation of the world. Currently, the poor, developing regions of sub-Saharan Africa and equatorial India, both ravaged by the onslaught of HIV/AIDS, have tens of millions of people infected with HIV. More disturbing is the number of orphaned children that has exponentially increased due to the spread of HIV/AIDS in both Africa and India (World Health Organization 2005; UNAIDS 2005). In many poor regions of the world, including sub-Saharan Africa and India, HIV/AIDS is most often spread via sexual contact between men and male and female sex workers, and secondarily between intravenous drug-using men and regular female sexual partners (Morison et al. 2001; Mitra 2004; Ubaidullah 2005; UNAIDS 2005). Consequently, many researchers have called attention to the need for an understanding of sexual health, including preventive behaviors (Ubaidullah 2004; Dandona et al. 2005; Datye et al. 2005; World Health Organization 2005; UNAIDS 2005).

Understanding sexual health as more than avoiding infectious disease pertinent to all men's lives. Compromises to sexual health, namely in the form of sexual dysfunction or other sexual problems, have profound negative psychosocial consequences. Men who feel that their sexual health has declined may feel less masculine than they did prior to the onset of sexual problems (Rosser et al. 1997; Jenkins et al. 2004). The assault to masculine identity could erode the mental health of men due to the socially constructed link between sexuality and identity (Kimmel 1990; Connell 1995). Likewise, sexual problems can negatively interrupt men's social and cultural identities. In most societies, sexuality is a normative component of existence and human nature (Laumann et al. 1994; Bolin and Whelehan 2001). Moreover, as a core component

of human identity, sexuality serves to join humans in socially intimate bonds. Thus, sexual health is relevant for men because of its ability to impact emotional intimacy with romantic partners. Sexuality is a vital component of most romantic relationships and the discontinuation of it is problematic for many (Schiltz and Sandfort 2000).

Sexual Health and HIV-Infected Men

Until fairly recently, sexual health has been primarily addressed from a biomedical standpoint (Laumann et al. 1994). Such is not surprising given the need to produce viable medical treatment for men encountering sexual problems. Yet, in the case of HIV, biomedical knowledge alone is not sufficient to understanding the nature of HIV transmission. The reason is that HIV complicates the sexual decision-making practices of men who are infected (Gochros 1992; Rhodes and Cusick 2000; Halkitis and Wilton 2005). The choices that these men make in engaging in sexual intercourse involve all the complexity that non-infected men face (Schiltz and Sandfort 2000). Yet, the possibility of infecting another partner or the possibility of acquiring an additional life-altering STI makes sexuality all the more confounding (Bimbi and Parsons 2005).

To the extent that HIV-infected men share similar social and sexual identities with non-infected men warrants investigation of their sexual health. This undoubtedly requires knowledge of the social and sexual factors that characterize these men as well as how these factors may temporally shift. Such will prove vital in understanding how and why, for example, some populations of HIV-infected men knowingly engage in unprotected intercourse (Remien et al. 1995; Remien et al. 2001; Bancroft et al. 2005). Therefore, in many ways, the need to understand the sexual health of HIV-infected men is even more imperative than understanding the sexual health of men in general.

The Initial Research Wave: Disease Transmission

During the early days of the HIV epidemic, prevention of disease transmission was one of the major foci of most initiatives. Such is not surprising given the rapidly rising HIV incidence and prevalence rates during the late 1980s. Both HIV-positive and HIV-negative persons were expected to curtail sexual intercourse for the sake of limiting the amount of exposures that could take place (Schiltz and Sandfor 2000; Feinleib and Michael 2001). Individuals who were HIV-infected suffered a great deal of stigma due to the types of behaviors that were associated with HIV disease transmission as well as overall uncertainty that society had towards a disease of such mystery (Shilts 1987; Gochros 1992). Consequently, the sexuality of HIV-infected persons was often viewed as being inherently risky, and HIV interventions tended to focus upon the cessation of sexual risk behaviors (Ostrow et al. 1989; Meyer-Bahlberg et al. 1991).

As we are now in the third decade of HIV/AIDS prevention initiatives, condom use messages are widespread, even to the point where a number of condom commercials advocate “condoms every time.” A number of researchers agree that HIV-positive people and people who are deemed at-risk for HIV know the risks associated with HIV (Cusick and Rhodes 2000; Schiltz and Sandfort 2000; Bimbi and Parsons 2005; Halkitis and Wilton 2005; Halkitis, Wolitski, and Gómez 2005). However, knowing the risks associated with HIV transmission and taking precautions to protect oneself and one’s partners from HIV are vastly different. Rhodes and Cusick (2000), for example, have demonstrated that the balance between HIV risk cognition and intimacy with sexual partners is highly complex. They suggest that HIV-infected men may knowingly engage in unprotected sex in order to satisfy desires for emotional intimacy. Similarly, Remien, Carballo-Diéguez, and Wagner (1995) argue that desires for emotional intimacy can result in decreased condom use with regular sexual partners of HIV-infected men. Therefore, it is clear that prevention initiatives must go beyond merely advocating for

consistency of condom use—they must also take into account HIV-infected men’s understandings of sexual health.

In the United States, the HIV pandemic is largely driven by sexual contact. In the year 2004, 89 percent of all HIV cases in the United States were associated with some form of sexual contact (Centers for Disease Control and Prevention 2004). Of all HIV transmissions, 57 percent were among men who have sex with men (MSM). Similar figures have been noted in prior years for this country. In Florida, the state in which data for this thesis were collected, 91 percent of all HIV cases in 2004 were due to sexual contact (Florida Department of Health 2004). Of the total number of HIV transmissions, 68 percent were among MSM. Given that sexual contact is the primary mode of transmission for HIV cases, it is necessary to understand the contextual factors that give rise to men’s sexual contact. Doing so will permit comment upon the meanings and consequences of sexual intercourse for this population. It is only then that we may understand the nature of high risk sexual behaviors that drive the HIV pandemic.

Sexual Intercourse

Though prevention is a necessity for the HIV pandemic, and abstinence effectively reduces transmission rates, it is naïve to assume that HIV-infected men will not engage in sexual intercourse. HIV-infected men had active sex lives prior to acquiring HIV (Wiktor et al. 1990; Bancroft et al. 2005). Many HIV-infected men are in long-term relationships with wives or partners who may not be HIV-infected (Cusick and Rhodes 2000; Rhodes and Cusick 2000). A considerable number of these men also live within social contexts where there are immense pressures to have sex (Schiltz and Sandfort 2000). This is particularly true for gay, and to a lesser extent bisexual, men due to the hypersexualized nature of gay social establishments that cater to the social and sexual needs of these men (Bimbi and Parsons 2005; Halkitis et al. 2005). Clearly, the sociocultural context of some communities of HIV-infected men is such that sex is

expected to occur as part of these men's lived experiences (Schiltz and Sandfort 2000; Van Kesteren et al. 2005). Consequently, interference with sexual activity results in lower overall quality of life (QOL). The majority of HIV-infected men remain sexually active after the discovery of their HIV infection (Ostrow et al. 1989; Wiktor et al. 1990; Shiltz and Sandfort 2000).

Socioemotional Experience

HIV-infected men without sexual partners may actively seek sexual partners in order to satisfy socioemotional and sexual needs that they may have. Partner availability is often a problem for these men due to marginalization from HIV infection and sexuality within the context of infection (Gochros 1992; Halkitis 2001). These men may feel a sense of great loss because of the lack of emotional intimacy that they have without the presence of a stable sexual partner (Ross and Ryan 1995). This may, in turn, lead to a host of psychosocial distresses ranging from minor depression to suicide, and to increased risky sexual practices (Meyer-Bahlburg et al. 1991).

Sexuality for HIV-infected men is similar to sexuality for men not infected with HIV. One of the primary differences is that for HIV-infected men, the additional dimension of disease transmission often complicates the initiation of new sexual partnerships or the stability of current partnerships. The majority of studies that have examined sexuality for HIV-infected men have extensively focused on the risk of disease transmission (Remien et al. 2001; Cove and Petrak 2004; Bancroft et al. 2005; Halkitis et al. 2005). Such consideration has led to a great deal of stigma surrounding the sexuality of HIV-infected men (Halkitis and Wilton 2005). Such stigma has been found to adversely affect coping mechanisms that these men use throughout the course of HIV infection (Bailey and Hart 2005).

To this end, sexuality should be examined as an issue of QOL for HIV-infected men. Sandfort, Graaf, and Bijl (2003) have demonstrated that sexuality is a vital component of QOL, particularly for MSM. In their nationally representative sample of 5,998 Dutch respondents, they found that homosexual men had considerably lower levels of quality of life in comparison to heterosexual men. Subsequently, they reasoned that this was due to sociocultural factors that continue to marginalize both homosexual identities and behaviors. Considering that the Netherlands is often regarded as far more tolerant of homosexuality than the United States, it is probable that MSM in the United States are likely to rate comparably lower on quality of life indices in comparison to their Dutch counterparts. This finding is especially relevant for HIV-infected men given decreased QOL due to disease infection and that far more than half of the U.S. population of HIV-infected persons are MSM (Centers for Disease Control and Prevention 2004a). HIV-positive men, especially those that are MSM, continue to bear the burden of social stigma due to notions of sexuality being associated with an HIV-positive serostatus (Schiltz and Sandfort 2000; Halkitis 2001).

Others proposing QOL approaches to sexuality for HIV-infected persons have more extensively examined the relational contexts of sexual encounters. O'Leary (2001) has shown that QOL ranks considerably higher among people who have healthy sexual relationships. Intimacy with sexual partners has been found to be strongly associated with improved physical and mental health for HIV-infected men in partnerships (Remien, Carballo-Diéguez, and Wagner 1995). These men face a number of challenges such as the negotiation of sexual safety, relationship security, and management of sexual stigma, as they initiate sexual partnerships (Cusick and Rhodes 2000; Rhodes and Cusick 2000). Also, living with HIV infection adds to the stress of initiating and maintaining relationships (Cusick and Rhodes 2000). Despite the

challenges that they face, however, the formation of healthy partnerships has proven to be beneficial for the psychosocial well-being of these men (Halkitis and Wilton 2005; Theodore et al. 2004).

Physical Performance

The quality of the sexual encounters of HIV-infected men also warrants attention, especially the role that sexual dysfunction plays in these men's lives. The prevalence of sexual dysfunction is greater for HIV-infected men, in comparison to HIV-negative men, because of low self-efficacy due to HIV-infection, the use of HAART, and other health-related conditions (Catalan and Meadows 2000; Schiltz and Sandfort 2000; Halkitis and Wilton 2005). HIV-infected men may also feel less than masculine due to the psychosocial distress that ensues as a result of decreased sexual functioning (Jenkins et al. 2004). The current sentiment of HIV literature is that sexuality remains vitally important to masculine identities of HIV-positive men despite decreases in sexual activity for some (Wagner et al. 1997; Richters, Hendry, and Kippax 2003; Bancroft et al. 2005; Schiltz and Sandfort 2000). This is particularly true for gay men, who often attribute the need for sexual activity to perceptions of sexual identity (Halkitis 2001). Due to the importance of sexuality, many HIV-positive men are forced to re-think their sexual identities when sexual problems are present. The inability to sexually perform may lead to a host of mental health issues further complicating the impact of deteriorating health in these men (Schiltz and Sandfort 2000; Bokhour et al. 2001; Jenkins et al. 2004).

In addition, HIV-infected men may justify the engagement of health risk behaviors in order to preserve or promote sexual function (Halkitis 2001; Richters et al. 2003; Cove and Petrak 2004). For example, sexual dysfunction has been noted as a key reason that HIV-positive men do not use condoms. HIV-positive men often lose erections because of decreased sensitivity associated with condom usage (Rosser et al. 1997; Wagner et al. 1997; Richters et al. 2003;

Bancroft et al. 2005). The lack of sexual sensitivity is crucial given that disease progression and the use of highly active anti-retroviral therapies (HAART) naturally diminish erection quality in HIV-positive men (Meyer-Bahlburg et al. 1991; Wagner et al. 1997). Cove and colleagues (2004) found that HIV-positive MSM, due to sexual difficulties, sometimes adopt the receptive role in sex and, thus, relinquish the negotiation of condom use to the insertive partner alone. The engagement in receptive anal intercourse, in addition, has been found to be associated with both erectile dysfunction and inconsistent condom usage (Cove et al. 2004; Purcell et al. 2005a). Other studies have found that HIV-positive men reporting any level of erectile dysfunction are significantly less likely to use condoms with both HIV-positive and HIV-negative partners (Bancroft et al. 2005; Purcell et al. 2005a).

Correlates of Sexual Health

Like overall health and well-being, sexual health involves more than the absence of disease inhibiting sexual function (Sandfort 2006). To unravel sexual health's importance for HIV-infected men involves a clear understanding of the factors known to affect sexual health in this population. In this regard, correlates of sexual health are important. Sexual health is not normally distributed throughout the population of HIV-infected men, but varies depending upon a number of factors. I outline three sets of factors related to the distribution of sexual health in HIV-infected men: sociodemographics, health, and substance use.

Sociodemographics

Age is perhaps the most salient factor affecting HIV-infected men's sexual health. Yet, the effects of age are often overlooked or taken for granted in studies examining the sexual health of HIV-infected men (for examples, see Meyer-Bahlburg et al. 1991 and Rosser et al. 1997). Given the effects of aging upon overall health, however, it is likely that sexual health will worsen as HIV-infected men progress throughout the lifecourse. Virtually every study of sexual

dysfunction focusing on age has noted its predictive power in the decline of sexual function (Feldman et al. 1994; Laumann et al. 1994; Laumann, Paik, and Rosen 2001; Aytac et al. 2000; Moinpour et al. 2000). Often, age has been found to be the most significant predictor of erectile dysfunction (Laumann, Paik, and Rosen 1999; Moreira et al. 2001). Gentili and Mulligan (1998) noted the association between age and decreased sex drive, time toward ejaculation, ejaculate volume, and perineal strength. Purcell and colleagues (2005), who specifically examined age as a predictor of sexual health among HIV-infected men, noted its influence in the use of Viagra, which is suggestive that older HIV-infected men have greater erectile difficulties than younger men.

Though most literature examining sexual health outcomes in HIV-infected men does not specifically examine race/ethnic differences, studies on men in the general population tend to suggest that ethnic minority men have worse sexual health than non-Hispanic white men (House and Williams 2000). One reason to suspect this is that racial/ethnic minorities tend to have worse overall health in comparison to whites (Laumann et al. 1994). Using the most comprehensive data on sexual dysfunction prevalence in the United States, Laumann and colleagues (2001) found that non-Hispanic blacks were significantly less likely to find sex pleasurable in comparison to whites. Non-Hispanic men of other races experienced a greater lack in sexual interest and more difficulty climaxing. (Hispanic men, on the other hand, reported less performance anxiety than white men.) HIV-infected black men may experience more erectile dysfunction in comparison to other men as well (Moreira et al. 2001). This may be due to more conservative attitudes about sexuality in the black community resulting in black men not seeking help when sexual problems arise (Neese et al. 2003; Jenkins et al. 2004).

Although probability samples suggest that racial/ethnic minority men may have worse sexual health outcomes than white men, some clinical samples tend to report no race/ethnic differences (Jonler et al. 1995; Milde, Hart, and Fearing 1996; Litwin, Nied, and Dhanani 1998). Many of such samples include few, if any, Hispanics and men of other race/ethnicities (Moinpour et al. 2000; Neese et al. 2003; Jenkins et al. 2004). Moreover, the outcome of consideration in clinical samples is usually erectile function, which provides no insight into other indicators of sexual health, such as the presence/absence of sexual activity, sexual drive, and satisfaction with one's sex life.

Socioeconomic status (SES), though closely tied to race/ethnic minority status, is also negatively related to sexual health outcomes. Many scholars have highlighted the distribution of sexual health along a socioeconomic gradient such that men with higher education and income levels possess better levels of sexual function and experiences than other men (Frank, Anderson, and Rubinstein 1978; Laumann et al. 1994; Litwin et al. 1998; Aytac et al. 2000; Moinpour et al. 2000; Moreira et al. 2001). One reason for this is that education provides men with knowledge of behaviors that are protective against sexual problems while, simultaneously, decreasing the chances that they will experience stress conducive to sexual health problems. Also, men with greater education are more likely to know of effective treatment options when they encounter sexual problems, such as erectile and orgasmic disorders. Like education, income affords men with the immediate access to effective treatment of sexual problems when they arise (Laumann et al. 1994). SES is crucial to the sexual health of HIV-infected men given that HIV disproportionately affects the poor and that many men experience declines in income subsequent to HIV incapacitation (Schiltz and Sandfort 2000; Halkitis et al. 2005).

For HIV-infected men, sexual behavior is of importance because it highlights the conditions in which sexual health is experienced. Cohabitation, for example, provides HIV-infected men with the availability of sexual partners. Because these men have more opportunities for sex, they are likely to have sex. Likewise, such men are less likely to experience arousal difficulties or be anxious about performing (see Laumann et al. 2001). It is probable, therefore, that men who live with sexual partners in cohabiting relationships experience greater sexual confidence, and thus, better ratings on various dimensions of sexual health (i.e., erectile function and sex drive). Several studies have emphasized the importance of studying HIV-infected men's sexual health given that many of them live with sexual partners (Remien et al. 1995; Cusick and Rhodes 2000; Rhodes and Cusick 2000; Remien et al. 2001; Theodore et al. 2004). Yet, sexual orientation cannot be ignored in the case of HIV-infected gay and bisexual men, who comprise most HIV cases in the United States (Centers for Disease Control and Prevention 2004). These men, most of whom acquire HIV from sex with other men, are likely to suffer more adverse sexual health outcomes in comparison to heterosexual men (Laumann et al. 2001; Moreira et al. 2001). Reasons include orientation dysphoria, discrimination, and lower overall perception of QOL (Catalan and Meadows 1992; Rosser et al. 1997; Sandfort et al. 2003; Sandfort 2006).

Health

As a dimension of physical and psychological well-being in HIV-infected men, sexual health is greatly impacted by men's present health states. In the general population, men with poor health have been shown to be at elevated risks for multiple categories of sexual dysfunction, especially decreased erection quality and lack of sex drive (Laumann et al. 2001). Declines in sexual health are especially pronounced with the onset of chronic disease conditions (i.e., diabetes, hypercholesterolemia, hypertension), their treatments, and the stress associated with

these conditions (Feldman et al. 1994; Prisant et al. 1994; Milde et al. 1996; Kutner et al. 2000; Moreira et al. 2001; Laumann et al. 2001; Lewis 2004). Similarly, prostate cancer has been shown to decrease the likelihood that men will have healthy erectile function and pleasurable sexual experiences (Bokhour et al. 2001; Fergus, Gray, and Fitch 2002; Jenkins et al. 2004). For HIV-infected men, particularly those who have developed AIDS, the impact of poor health upon sexual health outcomes is more critical because medications used to treat HIV can also adversely affect erectile function (Gochros 1992; Catalan and Meadows 2000; Schiltz and Sandfort 2000; Collazos et al. 2002; Colson et al. 2002).

Laumann and colleagues (1994, 2001) discuss at length the effects of adverse mental health upon sexual function and quality for men in the general population. Yet, for HIV-infected men, mental health plays a more salient role in sexual health outcomes. Subsequent to discovering their HIV status, many HIV-infected men suffer serious bouts with depression (Catalan et al. 1992; Dupras and Morisset 1993; Sandfort et al. 1995). Many fear the loss of enjoyable sexual experiences as well as infection of their sexual partners (Sandfort et al. 2000). Often, their initial response to discovering a positive serostatus includes the avoidance of sex for extended periods of time (Sandfort et al. 2000). Depression may also lead HIV-infected men to feel unattractive to potential partners (Gochros 1992; Halkitis 2001). As a result, they may refrain from actively pursuing sexual encounters (Dupras and Morisset 1993). When they do engage in sex, however, the effects of depression are likely to result in insufficient erections and unpleasurable experiences (Dupras and Morisset 1993; Rosser et al. 1997).

Substance Use

The negative effects of substance use upon sexual risk behaviors of HIV-infected men is well-discussed throughout the HIV literature (Gochros 1992; Halkitis 2001; Bimbi and Parsons 2005; Purcell et al. 2005a; Theodore et al. 2004; Purcell, Ibañez, and Schwartz 2005). However,

much less is known about the roles that chemical substances play in the etiology of sexual health outcomes other than risk among HIV-infected men. For Purcell and colleagues' (2005a) sample of HIV-infected men, alcohol use was correlated with Viagra use, which is suggestive that men who drink alcohol tend to have more erectile difficulties. Using samples of men not infected with HIV, others emphasize the negative effects of alcohol upon sexual desire and erectile function, especially among older men (Masters, Johnson, and Kolodny 1986; Feldman et al. 1994; Laumann et al. 2001). On the other hand, in some studies moderate levels of drinking were associated with improved erectile function and sexual desire due to alcohol's use in relaxation prior to sexual encounters (Rimm et al. 2000; Moreira et al. 2002; Bacon et al. 2003).

Cigarette smoking tends to promote arterial hardening, which disrupts healthy blood flow in and out of the penis (Gentili and Mulligan 1998). Albeit, tobacco's effect upon sexual health outcomes is somewhat inconclusive. Some studies have found smoking to be independently related to erectile dysfunction, especially among men over the age of 50 (Feldman et al. 1994; Mannino, Klevens and Flanders 1994; Bacon et al. 2003). Yet, other studies report no differences between smokers and non-smokers (Moreira et al. 2002; Gazzaruso et al. 2004). Studies examining tobacco's effects upon sexual health in HIV-infected men are clearly warranted (Burkhalter et al. 2005; Miguez-Burbano et al. 2005).

HIV-infected men often use illicit drugs in order to enhance the number and quality of sexual encounters (Halkitis 2001; Purcell et al. 2005b). Many HIV-infected men continue to have sex while actively using these substances (Goldberg et al. 1993; Palha and Esteves 2002). They sometimes report the enhancement of erections, sexual pleasure, and libido (Purcell et al. 2005b). Additionally, they may also experience better control over early ejaculation and, thus, greater satisfaction with their sex lives (Palha and Esteves 2002). However, the immediate

benefits of substance use are short-lived (Mathis 1970; Mirin et al. 1980; Masters et al. 1986; Goldberg 1993; Palha and Esteves 2002). More long-term use has been implicated in declines of sexual interest and orgasm (Mathis 1970; Mirin et al. 1980; Palha and Esteves 2002; Purcell et al. 2005a). Specific to HIV-infected men, illicit drug use is correlated with Viagra use, suggesting that drugs lead to decreased erectile quality (Purcell et al. 2005a).

Research Questions

The overall intent of this thesis is to describe the sexual health of HIV-infected men. In the past, studies have primarily focused on disease transmission and, thus, viewing the sexualities of these men as problematic. Consequently, little is known about the correlates of sexual health in HIV-infected men. In addition, the overwhelming majority of studies of sexual health in this population have been cross-sectional. Few have attended to sex drive and sex life satisfaction as viable dimensions of sexual health for HIV-infected men (Ross and Ryan 1995; Schiltz and Sandfort 2000). I proceed with the following research questions:

- What is the character of sexual health in HIV-infected men? What proportion of men are engaging in sexual intercourse? What are their levels of erectile function, sex drive, and sex life satisfaction? How are sexual health indicators associated?
- How are indicators of sexual health correlated with sociodemographic, health-related, and substance use factors? Are there consistent correlation patterns across the indicators of sexual health?
- Do the components of sexual health change over time? If they do change, how do they change? Are changes in sexual health associated with sociodemographic, health-related, substance use, or other sexual health correlates?

Answering these research questions will contribute to our understanding of the experiences of HIV-infected men in several ways. First, we will identify correlates of both psychosocial and physical dimensions of sexual health. Next, we will ascertain the role of overall health and sociodemographics in sexual health outcomes. Finally, we will acquire a better understanding of the changes in sexual health that can occur over time among HIV-infected men.

CHAPTER 3 RESEARCH DESIGN AND METHODS

Data and Sample

The data used for this thesis consisted of baseline, 12-month, and 24-month responses of participants who were recruited as part of a 24-month prospective cohort study entitled “Predictors of Outcomes in HIV-Infected Men.” The purpose of this study was to identify and compare predictors of HIV disease progression as well as develop assessment tools and biomedical interventions for HIV-infected men. Clinicians at three infectious disease clinics in the southeastern United States (i.e., a Veterans Affairs medical center, a university hospital, and a public health department) referred HIV-infected men to the principal investigator, Constance R. Uphold. After an in-depth explanation of the project, men who agreed to participate were enrolled if they met inclusion criteria.

A power analysis was conducted using sample-size calculations set at 5% significance levels for a two-sided, two-sample t-test. Based upon a power of 80%, a sample of 226 participants at baseline was considered ample to detect meaningful differences in the dependent variables in the larger study. Participants were enrolled until this sample size was attained. In order to enroll, participants had to be at least 18 years old, male, and able to speak English. They also had to have positive enzyme-linked immunosorbent assay screening and Western blot tests for HIV. Men taking corticosteroids and testosterone replacement therapy, had symptoms of acute bacterial and viral infections, had been diagnosed with HIV infection less than three months, had a recent (within 30 days) change in antiretroviral medications, and/or were demented or moribund (based upon a clinician’s assessment) were excluded from participation. These sample restrictions were deemed necessary because all of the aforementioned variables could affect immune functioning and other biological markers, which were of primary concern in

the larger study. The majority of the participants (88%) were taking highly active antiretroviral therapy or a combination of three or more medications to fight HIV infection.

At baseline, 131 participants (58%) were patients at a Veterans Affairs medical center, 40 (18%) were patients at a university hospital, and 55 (24%) were patients at the public health department. Participants ranged in age from 20 to 70, with a mean age of 45.7 (SD = 8.72). Slightly over half of the participants (55%) were White. About one-third lived in small towns or rural areas. Before the 12-month follow-up, six patients died and 23 men were withdrawn from the study due to the following: lost contact (15 patients), extreme sickness (4 patients), and geographic move (4 patients). Consequently, 197 men completed the 12-month follow-up. By the time of the 24-month follow-up, an additional 11 men had moved or were not able to be contacted, and four men had died. This resulted in 182 men with complete data at the 24-month follow-up.

Data Collection

Baseline data were collected between January 2001 and November 2002. Twelve-month data were collected between January 2002 and January 2004. Twenty-four month data were collected between January 2003 and March 2005. The men completed self-report questionnaires. Venipunctures were performed to obtain blood samples for analyses of CD4+ T cells and HIV RNA levels. Members of the research team reviewed the patients' medical records to validate demographic and clinical data obtained during the interviews. This study was approved by the human subjects committee of each recruitment site and the institutional review board of the university.

Sexual Health Indicators

Having Sex in the Past Three Months. Participants' involvement in sexual activity was measured at baseline, 12-months, and 24-months via the use of a questionnaire measuring risk

behaviors in HIV-infected men. The men were asked, “Have you had sex in the past 3 months?” They checked boxes indicating if they had sex in the past three months (1) or not (0).

Erectile Function. Erectile function was measured at the 12- and 24-month follow-ups. This was done by using the five-item International Index of Erectile Function (IIEF-5; see Rosen et al. 1999). Participants were asked, “How do you rate your confidence that you could get and keep an erection?” Responses were Likert-coded from (1) very low to (5) very high. In addition, participants were asked, “With stimulation, how often were your erections hard enough for intercourse?” Possible responses ranged from (1) “Almost never or never” to (5) “Almost always or always,” and (0) “no sexual activity” was an option for those who didn’t attempt intercourse. In order to ascertain participants’ perceptions of erection maintenance, they were asked, “During sexual intercourse, how often were you able to maintain your erection?” Responses ranged from (1) “Almost never or never” to (5) “Almost always or always,” with (0) “did not attempt intercourse” being an option for those not attempting intercourse. The same coding scheme was used for the question “When you attempted sexual intercourse, how often was it satisfactory for you?” The fifth question was “During sexual intercourse, how difficult was it to maintain your erection to completion of intercourse?” This item was Likert-coded from (1) “extremely difficult” to “not difficult.” Participants who did not attempt intercourse could answer accordingly (0). Based upon these responses, I created an index by summing all five items of the IIEF-5. Scores ranged from 5 – 25, with higher scores reflecting better erectile function. Men who did not have sex in the past three months did not receive a score on the index. Therefore, analyses using the erectile function index only include men who had sex within three months prior to the 12- and 24-month follow-ups.

Sex Drive and Sex Life Satisfaction. The men were also instructed to rate their sex drives. They were told, “Overall, during the past 30 days, rate your level of sex drive.” Similarly, the men were instructed, “Overall, during the past 30 days, rate how you felt about your sex life.” Both items included an ordinal scale ranging from one to ten, and men wrote in a numeric self-rating for each indicator. All men, including those who did not have sex in the past three months, provided data on their sex drives and satisfaction with sex lives. Therefore, a greater number of men have data for sex drive and sex life satisfaction than for erectile function.

Sociodemographic Correlates

Age was measured at baseline by the use of a demographic questionnaire. Participants were asked their dates of birth. An age variable was subsequently created based upon participants’ birthdates. An item for race/ethnicity was included on the demographic questionnaire. At baseline, participants chose the race/ethnic group with which they identified. Possible responses were Caucasian/white, African-American/black, Hispanic American/Latino, Asian/Pacific Islander, and “other.” Because of a relatively small number of Hispanics (11) and Asian/Pacific Islanders (two), all non-white individuals were grouped together. A dummy variable was created to distinguish non-Hispanic whites (1) from all others (0). Both education—measured at baseline—and household income—measured at all three time points—were used as proxy measures for socioeconomic status (SES). Education data came from the following question: “What is the highest level you went to school?” Responses were ordinally coded based upon the number of years participants attended school, beginning with ninth grade or less (9) through five or more years of college (17). For total household income, participants were given the following categories: less than \$8,240; \$8,241 – 9,999; \$10,000 – 19,999; \$20,000 – 34,999; \$35,000 – 59,999; and \$60,000 or more. Income categories ordinally ranged

from a low of 1 to a high of 6. Participants were also given the option of “refuse to answer” for both education and annual household income.

The participants also reported their cohabitation status on the demographic questionnaire at all three time points. The item provided the men with the following choices: single/never married, married—partner of the same sex, married—partner of the opposite sex, common law married/living as married, living with sexual partner of same sex, living with sexual partner of opposite sex, widowed, divorced, and separated. I subsequently created a dummy variable to denote those who cohabited with any partner (1) versus those who did not (0). The probable mode of transmission for HIV was determined at baseline. Study clinicians asked the men about the following behaviors that could have led to HIV infection: heterosexual contact, homosexual contact, intravenous drug use, blood transfusion, and unknown. Participants specified one or more modes that led to their infection with HIV. Dummy variables were created to denote the presence (1) or absence (0) of each mode of transmission. In this study, men who mentioned homosexual contact as a mode of transmission were grouped together regardless of the presence of other modes of transmission. This was done so that I could note sexual health differences that prior research has purported to exist between homosexually- and heterosexually-active HIV-infected men (Bimbi and Parsons 2005; Halkitis 2001; Halkitis 2005).

Health Correlates

All health measures were taken at baseline, 12 months, and 24 months. Disease comorbidity was measured using the Charlson Comorbidity Questionnaire, which is based on the Charlson Comorbidity Index (Charlson et al. 1987; Katz et al. 1996). This instrument contains 19 categories of disease comorbidity. Each category has an associated weight, which varies depending upon the risk of one-year mortality in comparison to individuals without the condition. Higher scores reflect a greater level of weighted comorbidity. The following are

conditions ascertained in this study (weights in parentheses): myocardial infarction (1), congestive heart failure (1), peripheral vascular disease (1), cerebrovascular disease (1), hemiplegia (2), asthma (1), lung disease (1; emphysema, chronic bronchitis, or chronic obstructive lung disease), ulcer disease (1), diabetes (2), renal abnormalities (2), connective tissue disease (1), Alzheimer's disease (1), mild liver disease (1), cirrhosis of the liver (3), leukemia or polycythemia vera (2), lymphoma (2), other cancer (2), metastasized cancer (6), and AIDS (6). The weighted index score appears in the following analyses.

Depression, another health correlate of interest in this study, was measured using the Center for Epidemiologic Studies Depression Scale (CES-D). This scale includes 20 items pertaining to depressed mood, feelings of guilt and worthlessness, helplessness and hopelessness, psychomotor retardation, loss of appetite, and sleep disturbance (Radloff 1977). All items were Likert-coded on a four-point scale ranging from 0 (rarely or none of the time) to 3 (most or all of the time). Total scores range from 0 to 60. The CES-D has been shown to possess high internal consistency reliability, with Chronbach's alpha scores ranging from .85 to .90 across studies (Radloff 1977). For this sample, Chronbach's alpha coefficient was .86. I also used an indicator of self-reported health. This item was taken from the HIV Cost and Services Utilization Study, from which resulted a tool frequently used to measure quality of life in HIV-infected individuals (Hays et al. 1998). Participants were asked, "In general, would you say your health in the past 4 weeks was: (1) excellent, (2) very good, (3) good, (4) fair, or (5) poor." The men checked the box most accurately reflecting their health.

Substance Use Correlates

Substance use data were collected at all three time points as well. Participants were asked, "On average, how many days per week do you drink alcohol?" They were also asked, "On a typical day when you drink, how many drinks do you have?" An interval-coded variable was

subsequently created in which the product of these two variables was calculated. This alcohol frequency variable is used in my analyses for alcohol usage. In addition, a risk behaviors questionnaire was used to inquire about the use of tobacco. Participants were asked about the use of cigarettes, cigars, and chewing tobacco. A dummy variable was subsequently created to denote the current use of any tobacco products. Also, participants were asked about the use of sedatives and hypnotics, cannabis, stimulants, opioids, cocaine, hallucinogens, and other drugs. Responses for the use of the given drugs were coded yes (1) or no (0). A variable was then created to indicate if participants used any illicit substances. This variable is constructed as a dummy variable in this study.

Procedures

I began by calculating descriptive statistics (means, proportions, and ranges) to ascertain levels of each sexual health indicator for the HIV-infected men in this sample. Due to the ordinal nature of each indicator, Spearman correlations were used to describe associations among having sex in the past three months, erectile function, sex drive, and satisfaction with sex life. To address the second research question, I performed correlations between each of the sexual health indicators and the sociodemographic, health-related, and substance use correlates.

In order to address whether changes in health and lifestyle produced changes in sexual health indicators, I used change scores and transition matrices. Change scores were calculated by subtracting the group mean at either the 12- or 24-month follow-ups from the group mean at either baseline or the 12-month follow-up, respectively. Positive change scores indicate improvement in sexual health indicators, while negative change scores indicate decline. Change scores were calculated only for continuous variables.

Transition matrices allowed me to examine individual-level change in sexual health indicators. Because of data availability, I was able to compare having sex for both the first year

(baseline and 12-month follow-up) and second year (12- and 24-month follow-ups). The remaining three indicators were examined for the second year only.

I recoded the erectile function scale for its use in the transition matrices. Men with scores of 5 – 7, 8 – 11, 12 – 16, 17 – 21, and 22 – 25 were originally considered to have poor, fair, good, very good, and excellent erectile function, respectively. These delineations were made based upon Rosen and colleagues' (1999) assessment of erectile function. However, the majority of men in this sample had excellent erectile function. Therefore, erectile function scores were coded as low (5 – 21) and high (22 – 25) for inclusion in transition matrices. For examining correlates of change in sexual health states, pure erectile function scores were used. Due to the ordinality and relatively small number of cases in each cell of the sex drive and sex life satisfaction variables, I recoded them so that scores of 1 – 3, 4 – 6, and 7 – 10 reflect low, medium, and high measures, respectively, for each variable.

Changes in sexual health indicators were determined by cross-tabulating the sexual health variable at 12 months with its comparable measure at 24 months. This resulted in an origin-destination contingency table where the distribution of the 12-month variable served as the origin and the distribution of the 24-month variable served as the destination. An additional transition matrix describes changes in having sex or not between baseline and 12 months.

After constructing transition matrices, I created a dummy variable to denote whether or not the men experienced a change in each sexual health indicator. This was done so that I could note if any changes in sexual health indicators were associated with sociodemographic, health-related, and substance use variables. For example, among men who did not have sex at baseline, if they reported having sex at the 12-month follow-up, then they were coded as starting sex (1) versus not starting sex (0). Likewise, among men who did have sex at baseline, if they reported not

having sex at the 12-month follow-up, then they were coded as stopping sex (1) versus not stopping sex (0). The same procedure was done to evaluate correlates of change in having sex, erectile function, sex drive, and satisfaction with sex life between 12 and 24 months. All data were analyzed using SAS® Version 8.2.

CHAPTER 4 RESULTS

In this chapter, I provide results of analyses that were conducted to answer my three primary research questions. I describe the univariate distribution of the sample at the 12-month follow-up by providing means or percentages of men on each sexual health, sociodemographic, health-related, and substance-use correlate. Where applicable, I compare the distributions in this sample to other samples of both HIV-positive and HIV-negative men. Next, I provide correlations between each of the sexual health indicators. I also provide correlations between sexual health indicators and each sociodemographic, health-related, and substance-use measure. I then describe longitudinal change through the use of transition matrices and, where applicable, change scores for each sexual health indicator. And, finally, I describe how change in each sexual health indicator is correlated with various sociodemographic, health-related, and substance-use correlates.

Sexual Health Profile

Univariate Analyses

Table 4-1 presents a univariate description of sexuality, sociodemographic, health-related, and substance-use correlates based upon data collected at the 12-month follow-up. About half of the sample reported having sex in the past month. This proportion is comparable to that found for HIV-positive men in other clinical samples (Hoff et al. 1997; Theodore et al. 2004). Men in this sample also reported moderate levels of sex drive and satisfaction with sex life. Of the entire sample of men, satisfaction with sex life and sex drive were rated in the middle, with scores of 5.5 and 5.9, respectively. The mean for erectile function within this sample was 21.2. Based upon Rosen et al.'s demarcations for the IIEF-5, this indicates that overall the men had mild erectile dysfunction in comparison to the general population of American men (Rosen et al.

1999). Only 37 percent of the sample can be classified as having any level of erectile dysfunction (results not shown) according to Rosen et al.'s (1999) scores of 5 – 22. This is substantially less than the proportion of men in Ende et al.'s (2006) sample of HIV-infected men, in which 74 percent of the men had erectile dysfunction.

The average age of the sample was 45.7, which is about six years higher than the age of many other HIV-positive samples (Catalan and Meadows 2000; Ende et al. 2006; Halkitis et al. 2005; Mayne et al. 1996; Sandfort et al. 1995; Theodore et al. 2004; Van Kesteren 2005; Wagner, Rabkin, and Rabkin 1997). This is, however, not surprising considering that about 58 percent of this sample is comprised of veterans, many of whom were retired (results not shown). Except for 11 Hispanics and two Asian-Pacific Islanders, all of the non-white individuals were black; therefore, all non-white men were grouped together. Slightly under half of the sample is non-white, which makes this sample more ethnically diverse than some samples examining sexual health issues in HIV-infected men (Cove and Petrak 2004; Mayne et al. 1996; Remien et al. 1995; Van Kesteren et al. 2005). The racial/ethnic composition of this sample, however, is quite similar to the racial/ethnic composition of HIV-infected men in the United States and Florida (Centers for Disease Control and Prevention 2004a; Florida Department of Health 2004; see also Purcell et al. 2005). The average educational level was 13.2 years, which is about the same as that in the general population (Laumann et al. 1994). Forty-nine percent of the sample had an annual household income that was \$10,000 – 34,999.

Twenty-three percent of the sample lived with a sexual partner of either the same or opposite sex. In terms of sexuality-related modes of transmission, this sample is distinctive in that it includes a substantial number of men who became infected by having sex with women; it does not primarily focus on men who acquired HIV from sex with other men as does most other

samples (Bancroft et al. 2005; Cove and Petrak 2004; Halkitis 2001; Mayne et al. 1996; Meyer-Bahlburg et al. 1991; Purcell et al. 2005; Remien et al. 1995; Richters et al. 2003; Ross and Ryan 1995; Rosser et al. 1997; Van Kesteren et al. 2005). Of the entire sample, slightly more than two-fifths acquired HIV via homosexual contact, which is considerably less than the general proportion of men acquiring HIV from other men for both the United States and the state of Florida (Centers for Disease Control and Prevention 2004a; Florida Department of Health 2004).

This sample was fairly healthy. The average depression score was 13, which is lower than Radloff's (1977) cut-off to denote depressive symptoms in the general population. Also, this score is considerably lower than that found in other studies that used the CES-D in order to assess depression in HIV-positive men, which indicates that this sample is less depressed than some other samples (see Lyon and Younger 2001; Mayne et al. 1996; Perdue et al. 2003). Most participants rated their health in the past four weeks as good (3.2). Fifty-nine percent of the sample reported that their general health was good, very good, or excellent (results not shown). In comparison to Laumann and colleagues' (1994) nationally-representative sample of non-HIV infected men, this sample had poorer self-reported health. The men also reported an average of about 3 comorbid conditions, and 38% of the men reported no comorbid conditions.

Only 36% of the sample reported using any alcohol (results not shown); of these men, the average alcohol frequency score was 3.4. Other substance use was reported by a considerable portion of this sample. Slightly over half of the sample, about double the proportion that is found in the general population, reported the use of tobacco (Laumann et al. 1994). Burkhalter et al.'s (2005) and Miguez-Burbano et al.'s (2005) studies, which specifically examined tobacco use among HIV-infected men, both found the proportion of smokers to be about two-thirds.

About one-fourth of my sample reported the current use of illicit drugs. This is similar to the proportion of men in Purcell et al.'s (2005a) sample who reported illicit drug use.

Bivariate Analyses

Table 4-2 presents interitem correlations of all sexual health indicators. There was a fair amount of consistency in the strength of the correlations between all indicators. Each correlation is moderately strong, ranging from .33 to .47. The correlation between sex drive and having sex in the past three months was the weakest. The moderate levels of association among sexual health components indicated the distinctive nature of each component. Men who had sex in the past three months reported stronger sex drives and greater satisfaction with their sex lives. A higher sex drive was also associated with greater satisfaction with one's sex life. Erectile function items were asked only of men who report sexual activity in the previous month. Better erectile function was associated with a stronger sex drive and greater satisfaction with sex life.

Table 4-3 presents correlations between each of the indicators of sexual health and all sociodemographic, health-related, and substance-use correlates. Approximately half of the sociodemographic correlations are statistically significant across multiple indicators of sexual health. Having sex in the past three months was most strongly correlated with cohabitation with a partner. Having sex was also associated with having higher household income. In addition, younger men were slightly more likely to report having sex in the three months prior to the 12-month follow-up.

Better erectile function was most strongly correlated with being younger. Men who did not acquire HIV infection by way of homosexual contact reported marginally higher erectile function. Similarly, reporting a better sex drive was likely among younger men and men cohabiting with a partner. Acquiring HIV via sex with another man was moderately associated with a decrease in sex drive. Satisfaction with sex life had more significant, though weak,

correlations than any of the other sexual health indicators. Greater satisfaction was reported among men who were non-white, less educated, cohabiting with a sexual partner, and not infected through homosexual contact.

The health-related correlates were the strongest performing set of variables. More than half of the health correlations were significantly associated with indicators of sexual health. Having sex in the preceding three months was not associated with any health correlates. However, men who had better self-reported health and less depressive symptom scores on the CES-D also reported higher erectile function. Though not as strong as self-reported health and depression, the number of comorbid conditions was also negatively correlated with erectile function: men with fewer comorbid conditions reported better erectile function. Health indicators were correlated with sex drive in a similar way. Fewer comorbidities, lower depression level, and better self-reported health were associated with a higher-rated sex drive. Satisfaction with sex life was only associated with depression, with greater satisfaction being present among men who were less depressed.

The use of substances was interesting for this sample. It was the poorest performing set of correlations, with only about a third reaching statistical significance. Having sex during the three months prior to the 12-month follow-up, a stronger sex drive, and greater sex life satisfaction were *positively* associated with alcohol consumption. I also observed higher satisfaction among tobacco users. Drug use was unassociated with all of the sexual health indicators.

Longitudinal Transitions Depicting Changes in Sexual Health Indicators

Longitudinal analyses of sexual health indicators among HIV-infected men are rare, but they are important because they reveal the extent to which sexual health indicators change over time and how change is affected by other covariates (Kippax et al. 1998; Wagner et al. 1997). I used two types of longitudinal techniques. First, I calculated change scores for erectile

dysfunction, sex drive, and sex life satisfaction in order to describe aggregate change for the indicators of sexual health. Next, I used transition matrices. They provided additional insight into change in sexual health, in comparison to change scores, because they describe change at the level of the individual. For each transition matrix, participants who did not have data at the starting point of the transition were excluded from the matrix. For example, when examining the transition of having sex between the 12- and 24-month follow-ups, only men who had data at 12 months were included in the matrix. This was done so that each transition contained the full number of participants possible at the start of each transition.

Table 4-4 displays the transition for having sex in the past three months at baseline and the 12-month follow-up. First, it is important to note that considerable stability in having sex is observed between the two time points. Of the 116 men who were not sexually active at baseline, 70 percent of them also were not sexually active at the 12-month follow-up. However, 16 percent of the sexually inactive men at baseline did have sex within three months of the 12-month follow-up. Of the 116 sexually inactive men, a total of 15 percent were lost to attrition at the 12-month follow-up. This is a higher proportion of attrition than among sexually active men. One hundred ten men reported having sex at baseline. Of the sexually active men, 19 percent became sexually inactive at the 12-month follow-up. The majority (70 percent) of sexually active men at baseline remained sexually active one year later. Of the men that did not have sex at baseline, 11 percent were lost to attrition at the 12-month follow-up.

Table 4-5 presents the change in sexual activity for the second year. Stability in activity status remains most typical. Specifically, 75 percent of sexually inactive men at 12 months remained inactive at 24 months. Likewise, 67 percent of sexually active men at 12 months were also sexually active at 24 months. Among men who experienced a change in sexual activity, 15

percent became sexually active at the 24-month follow-up. Yet, 25 percent of the sexually active men at 12 months indicated that they were no longer sexually active at the 24-month follow-up. Ten percent of the sexually inactive men and seven percent of the sexually active men were lost to attrition by the time of the 24-month follow-up.

In Table 4-6, I present change in erectile function between the 12- and 24-month follow-ups. (Although only 95 men reported having sex at 12 months, a total of 115 men provided erectile function data. It was later discovered that 27 people who said that they did not have sex at 12 months *did* provide erectile function data; however, seven men that reported having sex at 12 months *did not* complete the erectile function instrument. Therefore, an additional 20 people are included in the data for erectile function.) The change score for erectile function was -0.66, which indicates that the mean level of erectile dysfunction for the sample decreased by 0.66 points on Rosen et al.'s (1999) 25-point index. The diagonal cells formed by low and high erectile function at the two time points reveal stability in erectile function. Slightly more than half of the men who reported low erectile function at 12 months also reported low erectile function at 24 months. There is also a considerable level of high erectile function at 12 months, a level sustained by 55 percent of the sample at 24 months. A greater percentage of the participants who had low levels of erectile function (33 percent), in comparison to men with high levels (27 percent), were lost to attrition at the 24-month follow-up.

Table 4-7 depicts change in sex drive between the 12- and 24-month follow-ups. The change score for sex drive is -0.14, which indicates the sample only minimally decreased its overall sex drive level on the 10-point scale. The diagonal cells formed by low, medium, and high sex drive at the two time points reveal considerable stability in sex drive between the two time points. From the 12- to the 24-month follow-up, 16.6 percent of the sample (30 participants

occupying the cells above the diagonal) acquired a higher level of sex drive. However, 21 percent of the sample (38 participants occupying the cells below the diagonal) decreased its level of sex drive during the same time period. A greater percentage of the participants who scored low on sex drive (13 percent) were lost to 24-month follow-up than those who scored medium or low (eight percent for both).

Table 4-8 depicts the change in satisfaction with sex life between the 12- and 24-month follow-ups. Here, the change score is -0.41, which indicates that the sample decreased its level of satisfaction by about a half a point on the 10-point scale. Approximately one-half of participants scored the same for each level of satisfaction with sex life, suggesting modest stability in this indicator over time. In general, one's level of satisfaction with his sex life at the 12-month follow-up was highly associated with his level of satisfaction with his sex life at the 24-month follow-up. Seventeen percent of the sample (30 participants in the cells above the diagonal) acquired a higher level of satisfaction with sex life between the 12- and 24-month follow-ups. However, 26 percent (47 participants in the cells below the diagonal) acquired a lower level of satisfaction with sex life between the 12- and 24-month follow-ups. A greater percentage of participants who reported medium (13 percent) and high (eight percent) levels of satisfaction with their sex lives were lost to follow-up in comparison to men who reported low (five percent) levels of satisfaction with their sex lives.

Correlates of Transition in Sexual Health Indicators

In this section, I present correlations of transition in sexual health measures. Each sociodemographic, health-related, substance-use, and sexual health (where applicable) indicator is presented as a possible correlate of an improvement or decline in the corresponding sexual health measure. In order to ensure that the sociodemographic, health-related, substance-use, or sexual health measure was not a consequence of the measure of interest, I included these

variables as they were measured at the time point preceding the transition in sexual health. For example, in Table 4-9a, the income level used to determine if income is correlated with starting or stopping sex at the 24-month follow-up is the income measured at the 12-month, not 24-month, follow-up.

Table 4-9 displays the onset and cessation of having sex being correlated with sociodemographic, health-related, substance-use, and sexual health indicators. This is done for change between baseline and the 12-month follow-up as well as the 12- and 24-month follow-ups. Age is marginally correlated with the onset ($\rho = -.19$) and cessation ($\rho = .19$) of having sex within the three months prior to 12- and 24-month follow-ups. Younger men were more likely to start having sex in comparison to older men, while older men were more likely to stop having sex in comparison to younger men. Men who were cohabiting with a sexual partner at baseline and the 12-month follow-up were significantly less likely than men who were not cohabiting with a sexual partner to stop having sex at the 12- ($\rho = -.20$) and 24-month ($\rho = -.29$) follow-ups.

Though its significance is marginal, the number of comorbid conditions was positively correlated with the onset of sexual activity between the 12- and 24-month follow-ups ($\rho = .18$). This signifies that men with greater weighted comorbidity were more likely to start having sex at 24 months than men with less comorbidity. The frequency of alcohol use, on the other hand, was positively correlated with the cessation of sexual activity at the 12-month follow-up for men who had sex within three months of baseline data collection ($r = .19$). For men who did not report sexual activity within three months of the 12-month follow-up, the use of any illicit drugs was positively correlated with the onset of sexual activity. Men who reported having sex at the 12-month follow-up and reported a higher level of satisfaction with sex life at the 12-month follow-

up were less likely to stop having sex at 24 months than men who reported a lower satisfaction with sex life at the 12-month follow-up ($\rho = -.24$).

In Table 4-10, I present correlations of both improvement and decline in erectile function between the 12- and 24-month follow-ups. For men who had high erectile function at the 12-month follow-up, being older was positively associated with a transition to low erectile function at the 24-month follow-up ($\rho = .33$). Annual household income was negatively correlated ($\rho = -.25$) with a decline in erectile function at 24 months. This means that for men who had high erectile function at 12 months, a higher household income at 12 months was protective against acquiring lower erectile function at 24 months. Men who had a higher depression level, in comparison to men with low depression, at the 12-month follow-up were marginally more likely to report a decline in erectile function at the 24-month follow-up ($\rho = .37$). Likewise, among men who had high erectile function at 12 months, poorer self-reported health at 12 months was correlated with a transition to low erectile function at the 24-month follow-up ($\rho = .28$). Again, the use of illicit drugs at the 12-month follow-up protectively worked for men who had low erectile function at the 12-month follow-up. For these men, drug use marginally increased the likelihood of reporting high erectile function at the 24-month follow-up ($\rho = .33$).

Table 4-11 displays correlations of improvements and declines in sex drive and satisfaction with sex life between the 12- and 24-month follow-ups. Among men who reported medium and high levels of sex drive at the 12-month follow-up, men with higher education were significantly less likely to report a decline in sex drive at the 24-month follow-up ($\rho = -.18$). Similarly, income was negatively predictive of reporting a decline in sex drive ($\rho = -.18$) and satisfaction with sex life ($\rho = -.27$) between the 12- and 24-month follow-ups for men who reported medium or high scores at 12 months for each of these indicators. Among men who reported low

or medium levels of sex life satisfaction at the 12-month follow-up, men who acquired HIV by way of homosexual contact were marginally less likely to report an improvement in satisfaction with their sex lives at the 24-month follow-up ($\rho = -.18$). Similarly, an increased number of comorbidities at the 12-month follow-up made men who reported low or medium sex life satisfaction less likely to report an improvement with sex life satisfaction at the 24-month follow-up ($\rho = -.23$).

On the other hand, among men who reported low or medium levels of sex drive at the 12-month follow-up, reporting the use of any tobacco products at the 12-month follow-up was marginally predictive of an improvement in sex drive at the 24-month follow-up ($\rho = .18$). Sexual activity within the three months prior to the 12-month follow-up played a protective role for both sex drive and satisfaction with sex life at the 24-month follow-up. Having sex made men less likely to report declines in sex drive ($\rho = -.20$) and sex life satisfaction ($-.16$) if they reported medium or high levels on these indicators at the 12-month follow-up. In addition, erectile function at the 12-month follow-up served as a buffer against a decline in sex drive at the 24-month follow-up; erectile function at the 12-month follow-up was negatively correlated with a decline in sex drive between the 12- and 24-month follow-ups ($\rho = -.29$).

Table 4-1. Univariate distribution of sexuality, sociodemographic, health-related, and substance-use correlates (12 months)¹

	Mean (or %)	Range
<i>Sexual Health Correlates</i>		
Had sex in past month (%)	48.2	0 – 1
Erectile function ²	21.2	5 – 25
Sex drive ³	5.9	1 – 10
Quality of sex life ³	5.5	1 – 10
<i>Sociodemographic Correlates</i>		
Age	45.8	20 – 70
White (%)	54.8	0 – 1
Non-White (%)	45.2	0 – 1
Education (years)	13.2	9 – 17
Annual household income ⁴	\$10,000 – 19,999	\$ 0 – 60,000 or more
Cohabitation (%)	26.5	0 – 1
Homosexual mode of transmission (%)	42.6	0 – 1
<i>Health Correlates</i>		
Comorbidity index	3.3	0 – 13
Depression index	13.0	0 – 47
Self-reported health	3.2	1 – 5
<i>Substance Use</i>		
Alcohol frequency	3.4	0 – 42
Tobacco use (%)	53.8	0 – 1
Illicit drug use (%)	24.3	0 – 1

Notes:

¹N = 197, ²N = 115, ³N = 181. ⁴The mode is presented here due to the ordinality of the income variable..

Source: *Predictors of Outcomes in HIV-Infected Men*
 North Florida/South Georgia Veterans Health System;
 Constance R. Uphold, Principal Investigator

Table 4-2. Interitem spearman correlations between indicators of sexual health (12 months)^{1,2}

	Had sex in past month	Quality of sex life	Sex drive	Erectile Function
Had sex in past month	--	.40***	.33***	NA
Sex life satisfaction	--	--	.47***	.45***
Sex drive	--	--	--	.47***
Erectile Function	--	--	--	--

Notes:

¹*** p ≤ .001, ²N = 181.

Source: *Predictors of Outcomes in HIV-Infected Men*
North Florida/South Georgia Veterans Health System;
Constance R. Uphold, Principal Investigator

Table 4-3. Interitem spearman correlations between sexual health, sociodemographic, health-related, and substance-use correlates (12 months)^{1,2}

	Had sex in past 3 months	Erectile Function ³	Sex drive ⁴	Satisfaction with sex life ⁴
<i>Sociodemographics</i>				
Age	-.15*	-.30***	-.13†	-.02
White	-.06	-.00	-.09	-.13†
Education	-.05	-.00	-.05	-.12†
Annual household income	.20**	.03	.07	-.02
Cohabitation	.32***	-.02	.18**	.14†
Homosexual contact	-.01	-.17†	-.21**	-.18**
<i>Health-Related</i>				
Comorbidity index	-.05	-.15*	-.17*	-.10
Depression	-.02	-.32***	-.16*	-.23***
Self-reported health	-.04	-.28***	-.17*	-.10
<i>Substance Use</i>				
Alcohol frequency ⁵	.14*	-.04	.16*	.14†
Tobacco use	.10	.09	.09	.16*
Illicit drug use	.03	.03	.06	.04

Notes:

¹*** p ≤ .001, ** .001 < p ≤ .01, * .01 < p ≤ .05, † .05 < p ≤ .10. ²N = 197, ³N = 115, ⁴N = 181.

⁵Pearson correlations are presented due to alcohol frequency being an interval-level variable.

Source: *Predictors of Outcomes in HIV-Infected Men*
North Florida/South Georgia Veterans Health System;
Constance R. Uphold, Principal Investigator

Table 4-4. Change in having sex between baseline and 12 months^{1,2}

	12 Months		
	No	Yes	Lost to Follow-up
<i>Baseline</i>			
No (n=116)	.70	.16	.15
Yes (n=110)	.19	.70	.11

Notes:

¹N = 226; chi-square = 72.6, p < .001. ²Each cell shows destination probability based upon row proportions.

Source: *Predictors of Outcomes in HIV-Infected Men*
North Florida/South Georgia Veterans Health System;
Constance R. Uphold, Principal Investigator

Table 4-5. Change in having sex between 12 and 24 months^{1,2}

	24 Months		
	No	Yes	Lost to Follow-up
<i>12 Months</i>			
No (n=102)	.75	.15	.10
Yes (n=95)	.25	.67	.07

Notes:

¹N = 197; chi-square = 58.1, p < .001. ²Each cell shows destination probability based upon row proportions.

Source: *Predictors of Outcomes in HIV-Infected Men*
North Florida/South Georgia Veterans Health System;
Constance R. Uphold, Principal Investigator

Table 4-6. Transition matrix depicting erectile function between 12 and 24 months^{1,2}

	24 Months		
	Low	High	Lost to Follow-up
<i>12 Months</i>			
Low (n=42)	.57	.10	.33
High (n=73)	.18	.55	.27

Notes:

¹N = 115; chi-square = 27.64, p < .001. ²Each cell shows destination probability based upon row proportions.

Source: *Predictors of Outcomes in HIV-Infected Men*
North Florida/South Georgia Veterans Health System;
Constance R. Uphold, Principal Investigator

Table 4-7. Transition matrix depicting sex drive between 12 and 24 months^{1,2}

	24 Months			
	Low	Medium	High	Lost to Follow-up
<i>12 Months</i>				
Low (n=40)	.50	.28	.10	.13
Medium (n=51)	.29	.33	.29	.08
High (n=90)	.10	.16	.67	.08

Notes:

¹N = 181; likelihood ratio chi-square = 51.34; p < .001. ²Each cell shows destination probability based upon row proportions.

Source: *Predictors of Outcomes in HIV-Infected Men*
North Florida/South Georgia Veterans Health System;
Constance R. Uphold, Principal Investigator

Table 4-8. Transition matrix depicting satisfaction with sex life between 12 and 24 months^{1,2}

	24 Months			
	Low	Medium	High	Lost to Follow-up
<i>12 Months</i>				
Low (n=55)	.55	.24	.16	.05
Medium (n=52)	.35	.37	.15	.13
High (n=74)	.11	.28	.53	.08

Notes:

¹N = 181; likelihood ratio chi-square = 43.62, p < .001. ²Each cell shows destination probability based upon row proportions.

Source: *Predictors of Outcomes in HIV-Infected Men*
North Florida/South Georgia Veterans Health System;
Constance R. Uphold, Principal Investigator

Table 4-9. Spearman correlations of change in having sex with sociodemographic, health-related, substance-use, and sexual health measures¹

	Started ² having sex (baseline to 12 months; n=99)	Stopped ² having sex (baseline to 12 months; n=98)	Started ³ having sex (12 to 24 months; n=92)	Stopped ³ having sex (12 to 24 months; n= 88)
<i>Sociodemographics</i>				
Age	.02	.11	-.19†	.19†
White	-.15	.05	-.04	-.14
Education	.02	.03	-.06	-.06
Annual household income	-.03	-.05	.05	-.17
Cohabitation	-.04	-.20*	.07	-.29**
Homosexual contact	-.04	-.04	-.03	-.00
<i>Health-Related</i>				
Comorbidity index	.07	.02	.18†	-.01
Depression	.14	.01	.08	.04
Self-reported health	.13	.06	.01	.03
<i>Substance Use</i>				
Alcohol frequency ⁴	.04	.19†	-.07	.09
Tobacco use	.04	-.06	-.02	-.08
Illicit drug use	-.03	.06	.29**	-.10
<i>Sexual Health</i>				
Sex drive	--	--	.01	-.10
Sex life satisfaction	--	--	-.09	-.24*

Notes:

¹*** $p \leq .001$ ** $.001 < p \leq .01$ * $.01 < p \leq .05$ † $.05 < p \leq .10$. ²Sociodemographic, health-related, substance-use, and sexual health variables are measured at baseline. ³Sociodemographic, health-related, substance-use, and sexual health variables are measured at 12 months. ⁴Pearson correlations are presented due to alcohol frequency being an interval-level variable.

Source: *Predictors of Outcomes in HIV-Infected Men*
North Florida/South Georgia Veterans Health System;
Constance R. Uphold, Principal Investigator

Table 4-10. Spearman correlations of change in erectile function with sociodemographic, health-related, substance-use, and sexual health measures^{1,2}

	Improved erectile function (12 to 24 months; n=28)	Declining erectile function (12 to 24 months; n=53)
<i>Sociodemographics</i>		
Age	-.04	.33*
White	-.09	-.08
Education	-.02	-.12
Annual household income	-.09	-.25†
Cohabitation	.23	-.07
Homosexual contact	.00	-.19
<i>Health-Related</i>		
Comorbidity index	-.08	-.00
Depression	.18	.37†
Self-reported health	-.06	.28*
<i>Substance Use</i>		
Alcohol frequency ³	.20	-.01
Tobacco use	-.03	-.01
Illicit drug use	.33†	.03
<i>Sexual Health</i>		
Sex drive	.21	.01
Sex life satisfaction	.05	.06

Notes:

¹*** $p \leq .001$ ** $.001 < p \leq .01$ * $.01 < p \leq .05$ † $.05 < p \leq .10$. ²Sociodemographic, health-related, substance-use, and sexual health variables are measured at 12 months. ³Pearson correlations are presented due to alcohol frequency being an interval-level variable.

Source: *Predictors of Outcomes in HIV-Infected Men*
North Florida/South Georgia Veterans Health System;
Constance R. Uphold, Principal Investigator

Table 4-11. Spearman correlations of change in sex drive and satisfaction with sex life with sociodemographic, health-related, substance-use, and sexual health measures^{1,2}

	Improved sex drive (12 to 24 months; n=82)	Declining sex drive (12 to 24 months; n=130)	Improved satisfaction with sex life (12 to 24 months; n=97)	Declining satisfaction with sex life (12 to 24 months; n=113)
<i>Sociodemographics</i>				
Age	.04	.07	.12	.12
White	.01	-.07	-.04	-.04
Education	.03	-.18*	-.02	-.09
Annual household income	.16	-.18*	.05	-.27**
Cohabitation	-.08	-.09	-.08	-.03
Homosexual contact	-.07	.01	-.18†	-.08
<i>Health-Related</i>				
Comorbidity index	.03	.11	-.23*	.03
Depression	.13	.02	-.06	-.01
Self-reported health	.13	.08	-.15	.10
<i>Substance Use</i>				
Alcohol frequency ³	.15	-.04	.15	.02
Tobacco use	.18†	.08	-.07	.15
Illicit drug use	-.08	.08	-.12	-.03
<i>Sexual Health</i>				
Had sex	.13	-.20*	-.07	-.16†
Erectile function	-.04	-.29**	.06	-.05
Sex drive	---	---	.01	-.09
Sex life satisfaction	-.13	.03	---	---

Notes:

¹*** p ≤ .001 ** .001 < p ≤ .01 * .01 < p ≤ .05 † .05 < p ≤ .10. ²Sociodemographic, health-related, substance-use, and sexual health variables are measured at 12 months. ³Pearson correlations are presented due to alcohol frequency being an interval-level variable.

Source: *Predictors of Outcomes in HIV-Infected Men*
North Florida/South Georgia Veterans Health System;
Constance R. Uphold, Principal Investigator

CHAPTER 5 DISCUSSION

In the opening chapter, I outlined the importance of studying the sexual health of HIV-infected men. It was here that I argued that sexual health not be examined as only an issue pertaining to HIV prevention among HIV-infected men. I also asserted the importance of examining sexual health as an issue related to quality of life in these men, much as it is now regarded as an issue of quality of life in all men. In this regard, I stated that sexual expression is normative for HIV-infected men and that by understanding the components that lead to sexual expression and quality, we can then understand the extent to which HIV prevention measures can be undertaken in this population. Instead of viewing sexual health as the mere absence of disease, I conceptualized it in terms of the men's participation in sexual activity as well as the quality of their sexual experiences (i.e., sexual function). I also included socioemotional measures of sexual health (i.e., drive and satisfaction with sex life) in order to capture psychosocial significance of sexuality for the men in my sample. Additionally, I outlined the importance of sociodemographic, health-related, and substance use correlates that have been suggested by prior studies as covariates of sexual health.

In keeping with the rationale of this study, I posed three key research goals. The first was to assess the character of sexual health in my sample. This was done by simply observing the men's responses for whether or not they had sex, erectile function, level of sex drive, and level of sex life satisfaction. Second, I observed the extent to which my four indicators of sexual health correlated with sociodemographic, health-related, and substance use correlates as well as the consistency with which these correlates related to sexual health indicators. My last objective was to note if sexual health varied longitudinally. Here, I tested whether changes in sexual health were correlated with sociodemographic, health-related, and substance use correlates.

The Cross-Sectional and Longitudinal Relation of Sexual Health Indicators

As would be expected for indicators of sexual health, correlations exist between having sex and more subjective measures (i.e., sex drive and satisfaction with sex life). Likewise, more subjective measures are correlated with erectile function. Simply put: HIV-infected men who have higher sex drives and satisfaction with their sex lives are more likely to have sex. Similarly, those who have sex are likely to enjoy it. Prior research has shown that HIV-infected men who have active sex lives are likely to also experience higher levels of self-worth and self-affirmation (Schiltz and Sandfort 2001; Bimbi and Parsons 2005; Halkitis and Wilton 2005). Gochros (1992) and Sandfort et al. (1995) suggest that sex may actually help some HIV-infected men cope with loneliness, fear, and alienation due to their HIV-status and/or sexual orientation in the case of gay and bisexual men. Consequently, the positive correlation between having sex and satisfaction with sex life is consistent with the hypothesis that HIV-infected men who have active sex lives also have more positive psychological outlooks. Additionally, it is not very likely that these correlations appeared due to chance alone. All significance levels for the interitem correlations of sexual health indicators were less than .0001.

Longitudinal analyses, a major strength of this study, offer further validation of the interrelatedness of sexual health indicators (see Tables 4-9 and 4-11). Yet, these analyses offer an interesting perspective on the ways that various indicators affect other indicators over time. Men who, at one point in time, are actively having sex are not likely to experience declines in their motivation for sexual activity. Nor are they likely to experience declines in satisfaction with their sex lives. Men who experience such declines are those who do not have sex. At the same time, men who are not satisfied with their sex lives are likely to cease sexual activity. This suggests that how men think about their sexual lives plays a role in whether they continue to engage in sexual activity. Due to small sub-samples in Tables 4-9, 4-10, and 4-11, I am unable

to provide a definitive answer as to the role of sex drive in predicting erectile function.

However, that a significant proportion of my findings are statistically significant attests to the power each sexual health indicator has in predicting the other. These findings shed light upon the roles of sociodemographic, health-related, and substance use covariates as outlined later in this chapter.

Nonetheless, correlations between indicators of sexual health are only moderate. I propose several reasons for this observation. To begin, sexual activity alone does not necessarily produce a higher rating on measures indicating the quality of one's sexual experiences or sex life. For some men, the initiation of sexual intercourse may result in a host of psychosocial distresses that are not accommodated through intercourse alone. The HIV-literature has consistently reported findings on many of the negative outcomes of sex for HIV-positive men (Gochros 1992; Bailey and Hart 2005; Bancroft et al. 2005; Bimbi and Parsons 2005). Included are fear of (re)infecting sexual partners, guilt for nondisclosure of HIV status, self-punishment, and, increased guilt for altogether engaging in sexual activity (Schiltz and Sandfort 2000; Bimbi and Parsons 2005; Halkitis and Wilton 2005). Because of these factors, men who experienced negative outcomes subsequent to sexual activity, but were included in my measure of satisfaction with sex life, likely contributed to this correlation being only moderate.

Another reason for the moderate associations between having sex and more subjective measures is that sexual contact is sometimes a direct consequence of their sexual partners wanting sex more than the men. This is particularly true for men who may be partnered with individuals who are HIV-negative (Remien et al. 1995; Remien et al. 2001). As outlined in the beginning of this thesis, HIV-negative partners are likely to have better overall erectile function and libido than HIV-infected partners. As a result, when HIV-negative individuals encourage

their partners to have sex with them, the HIV-infected men may not have as an enjoyable experience as would be the case if their libido or erectile function were higher.

Additionally, there is a great deal of complexity involved with HIV-infected men's sexual encounters that cannot be captured by all indicators that I have used for sexual health. As asserted by Halkitis and Wilton (2005:34), "[s]ex functions on many levels and incorporates intrapersonal, interpersonal, and temporal paradigms." Sex takes on a very different meaning for HIV-infected men once they discover their HIV-status. A number of these men likely faced rejection upon disclosure of their serostatus to potential partners (Gochros 1992; Schiltz and Sandfort 2000). Also, "having sex" may mean very different things to different men. HIV-infected men engage in a wide range of behaviors that are not limited to vaginal or anal intercourse, which require firm erections. For some, sex may refer to receptive and/or insertive oral sex (Van Kesteren et al. 2005). Others may base their ratings of sex drive and sex life satisfaction on mutual masturbation (Richters et al. 2003; Jenkins et al. 2004). Some HIV-infected gay men who choose to be celibate may rate their "satisfaction with sex life" based upon the quality of their relationship with a sexual partner rather than actual sexual intercourse (Ross and Ryan 1995). These are possible reasons why the relationship between erectile function and sexual quality and drive is not as strong as we may have expected. To alleviate the uncertainty of what "having sex" may mean to different HIV-infected men, future studies should seek to collect longitudinal data with specific measures for all types of sexual activity—active and passive mutual masturbation, oral sex, and anogenital contact—as others have done (Meyer-Bahlburg et al. 1991; Hart et al. 2003; Richters et al. 2003; Theodore et al. 2004).

Furthermore, the questions that this study asked pertaining to sex drive and sex life satisfaction were asked of all men, not only men reporting sexual activity at the 12-month

follow-up. To the extent that sexual activity is key to the gender and sexual identities of men in general, men who did not have sex at the 12-month follow-up were likely to rate their sex drives and lives lower than men who did have sex (Halkitis 2001). Moreover, having a lower sex drive and sex life satisfaction could also be a reason that the men were not having sex. Halkitis and Wilton (2005) have argued that sexual activity for HIV-infected men extends well beyond the physical pleasure and emotional bonds of which it may be indicative. Sex also serves as an affirmation of their existence as human beings. Previous research suggests that HIV-infected men who do not have sex lives may also have lower levels of self-worth. If this is true of men in my sample, it may help to explain the more correlation between having sex and sex life satisfaction, and having sex and sex drive.

How Does Individual-Level Sexual Health Change Over Time?

Stability in sexual health, at least at the level of the individual, is a hallmark for participants in my sample. Over time, men tend to maintain their levels on each sexual health indicator. This lack of variability at the individual level shows that change, in the grand scheme of things, is not likely for each person. The indicator with the lowest probability of change is the most objective: having sex.

Yet, sexual health does change for some individuals. And, when it changes, it is more likely to change for the worse than for the better. For all indicators of sexual health, a greater proportion of men having high levels at one time point reported lower levels at the following time point than did men with low levels at the first time point reporting higher levels at the next. Yet, a greater proportion of men with low levels of sexual health were lost to attrition. That this trend of declining sexual health persisted amid a greater proportion of “sicker” men being lost for the follow-up shows that, like other health outcomes, sexual health will generally decrease over time. The normal course of an individual’s HIV disease progression, confounded by a host

of other health conditions, is likely to play a vital role the observed sexual health trajectory. In the case of *sexual* health, however, age becomes quite salient in this trajectory and, perhaps, operates in tandem with declining health. For this sample, due to it being approximately six years older than most samples of HIV-infected men, sexual health problems are likely to present themselves more often anyway.

Why Does Sexual Health Change? Examining Group-Level Characteristics

Sociodemographic Effects

Older men in my sample were more apt to report lower erectile function, sex drive, and likelihood of having sex in comparison to younger HIV-infected men. These findings are to be expected given the negative effects of age upon libido, erectile function, and, consequently, sexual activity for men in the general population (Feldman et al. 1994; Gentili and Mulligan 1998; Laumann et al. 1994; Laumann et al. 1999; Aytac et al. 2000; Moinpour et al. 2000; Laumann et al. 2001; Moreira et al. 2001). Longitudinal analyses support this finding based upon the cross-sectional analyses. It is clear that older men are more likely to stop having sex, whereas younger men are likely to begin to have sex (see Table 4-9). The primary reason for this is erectile function, as age is strongly associated with erectile function decline among the 53 cases who began the year with high erectile function (see Table 4-10). Because erectile function decreases with age and is necessary in order to have sexual intercourse, the observable effects of age are not surprising.

Yet, the effects of age must be considered relative to its absent association with sex life satisfaction, which suggests that older men may be more content with or accepting of their lower erectile function, libido, and likelihood of sexual intercourse. Overall changes in life situations—such as relationship dissolution, the death of a spouse or partner, and deteriorating health—may force older HIV-infected men to reconsider the role of sexual intercourse in their

lives. This reconsideration may lead to some level of satisfaction with their sex lives despite not having intercourse or the desire for it as do younger men. Yet, for others, the renegotiation of sexuality may mean that they choose to engage in other forms of potentially satisfying sexual intimacy, such as manually and orally stimulating their partners (see Fergus et al. 2002).

Though sexual health outcomes have been shown to vary between whites and non-whites in the general population, it is surprising that race/ethnicity was not associated with the likelihood for sexual intercourse, erectile function, or sex drive (Laumann et al. 1994; Laumann et al. 2001). Race/ethnic minority status was marginally associated with an *increase* in sex life satisfaction, which contrasts findings regarding racial/ethnic sexual health disparities in the literature. Several possibilities may account for these inconsistencies. That non-whites rated their sexual health at equal or better levels than whites is suggestive that sexual health may not vary as much by race/ethnicity among HIV-infected men as it does in the general population. Both white and non-white HIV-infected men have to manage the added stresses and hardships brought on by HIV-infection. Thus, they are likely to be more similar sexual health than are white and non-white men in the general population. For example, men who become HIV-infected, regardless of race/ethnicity, are often deemed “high risk” (i.e., due to high numbers of sexual partners, unprotected anal intercourse with men, and intravenous drug use, CDC 2005). Specific to this sample, white and non-white men did not differ in education levels, a factor known to be associated with increased sexual health outcomes. For these reasons, the racial/ethnic variation that we observe in sexual health outcomes within the general population may be less due to HIV-infected men of different race/ethnicities being altogether more alike.

Alternatively, the lack of association between race/ethnicity and sexual health indicators could be due to the distribution of risk covariates among white men in this sample. White men

were likely to have acquired HIV via homosexual contact (results not shown), a known risk factor for sexual problems (Bahr and Weeks 1989; Rosser et al. 1997; Catalan and Meadows 2000). (Men who acquired HIV by way of homosexual contact also reported a greater number of greater level of chronic disease comorbidity.) White men, on average, also had lower levels of self-reported health (results not shown), which is also a predictor of sexual health (Laumann et al. 2001). For these reasons, white men in this sample reported lower levels of sex life satisfaction and equal, not better, levels on the other indicators. It is likely that the race/ethnic role in the etiology of sexual health was masked due to the disproportionate physical and psychosocial health burden carried by white men in this sample.

Last, it is possible that the positive effect of race/ethnic minority status upon sex life satisfaction is indeed due to race/ethnic minority status being independently associated with increased sex life satisfaction. This explanation may at first glance appear untenable in comparison to the other two due to the well-established findings regarding race/ethnic sexual health disparities based upon large-scale population-level samples in the United States and abroad (Laumann et al. 1994; Laumann et al. 2001; Moreira et al. 2001; Lewis 2004). However, this explanation is rather defensible if we take note that population health data provide only partial insight into the sexual health of HIV-infected men assessed in *clinical* samples, in which we would expect men of different race/ethnic backgrounds to be more similar than are men in the general population. Several clinical samples have reported no racial/ethnic differences in erectile function among whites and non-whites (Jonler et al. 1995; Milde et al. 1996; Litwin et al. 1998). Moreover, Kutner et al. (2000) found that older, white hemodialysis patients were significantly more likely to complain of sexual dysfunction problems in comparison to older blacks. Among those with adverse health conditions—which would include HIV—some have commented upon

the protective effects of racial/ethnic minority status for non-Hispanic blacks and, particularly, Hispanics (House and Williams 2000; Williams and Collins 2002).

The only socioeconomic status (SES) indicator to be associated with increased sexual health was annual household income; yet, it was only associated with an increased likelihood of having sex. This association, however, was spurious because people who cohabited were more likely to report higher income ($\rho = .33, p < .001$). Further analyses confirmed that the predictive power of income upon having sex waned when cohabitation was added to a logistic regression model containing income (results not shown). Undoubtedly, the presence of a sexual partner in one's household increases the likelihood that one's household will have additional income (Haas 2002). Education's weak, negative association with sex life satisfaction is likely due to higher education being present among men who were white and acquired HIV by way of homosexual contact, which both exhibit negative associations with sex life satisfaction.

While SES may not serve promote positive sexual health outcomes, it certainly performs as a buffer to declining erectile function, sex drive, and sex life satisfaction. In this regard, SES serves as a promoter of sexual health stability. This finding is supported by a large research literature on health disparities, which documents the value of socioeconomic resources in preserving health capital over time (House and Williams 2000; Lynch and Kaplan 2000; Williams and Collins 2002). As a socioeconomic resource, education provides HIV-infected men who encounter sexual health problems with knowledge of viable treatment options. In turn, income, which more often than not, results from high levels of education, allows for immediate access to medical care that, at the least, has the ability of preventing a decline in sexual health. Those without such socioeconomic resources are considerably more vulnerable to sexual health decline when sexual problems present themselves. Ultimately, while men with high SES may

not do better in terms of sexual health at any one point in time, they certainly have protection from rapid declines in sexual health.

Cohabitation with sexual partners provided HIV-infected men in this sample with greater opportunities for having sex. Therefore, men who cohabited were more likely to have sex as well as possess higher sex drives and satisfaction with their sex lives. This cross-sectional finding persists over time by decreasing the likelihood that cohabiting men cease to have sex. Such is not surprising given comparable findings from national data sources (Laumann et al. 1994, 2001). It is clear that the presence of a sexual partner in the household exerts a positive influence upon how HIV-infected men think about their sexual motivations, satisfactions, and, ultimately, their likelihood of having sex at all. Among HIV-infected men who are married or are in committed partnerships, having been with a partner for an extended period of time often leads to them developing stronger sexual bonds with him/her. Thus, intimately “knowing” one’s cohabiting partner serves to enhance the quality of sexual experiences shared (see Cusick and Rhodes 2000; Rhodes and Cusick 2000). Additionally, everyday life stresses—such as those associated with managing household tasks or health worries due to HIV—may be alleviated with the presence of a sexual partner in one’s home (Haas 2002). Given that stress has strong, negative effects upon sexual interest and satisfaction, it is not at all surprising that men in this sample who cohabited rated sex drive and sex life satisfaction higher than other men.

On the other hand, the presence of a sexual partner in one’s home does not guarantee that one’s physical functioning will increase. HIV-infected cohabiting men in my sample, despite experiencing improvements in sexual health, did not experience increased erectile function. In this study, this finding persisted for cross-sectional and longitudinal analyses. Thus, while a sexual partner may help one to maintain libido, satisfaction, and opportunities for having sex, a

partner's presence may do nothing at all for helping an HIV-infected man's erectile function. Many causes of erectile dysfunction are physiological in nature (Dupras and Moriset 1993; Kutner et al. 2000; Bokhour et al. 2001; Laumann et al. 2001; Collazos et al. 2002; Colson et al. 2002; Bacon et al. 2003; Cove and Petrak 2004; Gazzaruso et al. 2004). Moreover, the causes of erectile dysfunction (i.e., diabetes, high cholesterol, heart disease, HIV, and medications taken for these conditions) are not easily mollified by the presence of a sexual partner. As a physiological problem among men with ill health, especially HIV-infected men, erectile dysfunction is likely to require medical attention. Other studies of chronically-ill men support this assertion (see Fergus et al. 2002; Jenkins et al. 2004).

Men who acquired HIV by way of homosexual contact, in comparison to other men, experienced lower levels of erectile function, sex drive, and sex life satisfaction. Yet, the predictive power of mode of transmission is most evident in terms of satisfaction with one's sex life. Men who became infected through homosexual contact were not likely to experience improvements in sex life satisfaction while other men were. Being less satisfied at the outset and remaining that way over time says much about how sexual orientation and its inevitable sequelae stifle sexual enjoyment for these men. Existing literature on the disproportionate sexual health burden borne by HIV-infected men who have sex with men (MSM) supports this notion (Catalan and Meadows 1992; Rosser et al. 1997; Laumann et al. 2001; Moreira et al. 2001; Sandfort et al. 2003; Sandfort 2006).

HIV-infected MSM are still marginalized by a society that, by and large, illegitimizes homosexual relations (Sandfort et al. 2003). Often, these men suffer from internalized homophobia, in which they express dislike toward themselves as homosexually-active men. Internalized homophobia has been implicated in the etiology of HIV-infected MSM's problems

with self-esteem, sexual orientation dysphoria, and fear of AIDS—all of which lead to these men experiencing less pleasurable sexual experiences, more erectile difficulties, and decreased confidence in their sexual capabilities (Bahr and Weeks 1989; Rosser et al. 1997).

These adverse effects are amplified for MSM who lack access to a visible gay community, which helps to buffer the homophobia perpetuated by society at large (Malebranche 2003; Mays et al. 2004). MSM who tend to lack access to such communities tend to be those who live in non-urban areas and/or are men of color (Mays et al. 2004). Both rural areas and communities of color tend to be more socially conservative than are large cities and communities more common to whites (Laumann et al. 1994). Thus, they are likely to express greater levels of disapproval toward homosexuality. Yet, even the inaccessibility of gay organizations or nightclubs may play a role in rural and non-white MSM internalizing homophobia. Other studies of HIV-infected men which, like mine, possess high numbers of non-white MSM and MSM who live in non-urban areas may help elucidate these variables in the etiology of internalized homophobia and, ultimately, adverse sexual health.

Though men who become HIV-infected by having sex with other men suffer negative outcomes when they have sex, sex remains important for them. For this reason, HIV-infected MSM in my sample were no less likely than other men to have sex; also, they were no more likely than other men to stop having sex over time. These findings underscore the role that sexual activity has in affirming gender and sexual identities in the lives of HIV-infected MSM. Hegemonic constructions of masculinity have traditionally relegated gay and bisexual men to a “feminine” status due to their sexual preferences for other men (Connell 1995; Halkitis 2001). Yet, despite being perceived as effeminate within this traditional framework of gender, these men often engage in sexual behaviors that validate their statuses as men and, thus,

(over)compensate for their perceived lack of virility (Kimmel and Levine 1989; Kimmel 1990). As a result, gay and bisexual men as a whole tend to have more sexual partners over the lifecourse than do men in the general population (Laumann et al. 1994; Laumann et al. 2001). In addition, they sometimes seek out “gay-friendly” environments (i.e., nightclubs and bathhouses) that, although conducive risk, make sex readily available to them. For gay and bisexual men, who for any number of reasons (i.e., self-hate for being non-homosexual, fear of further spreading HIV within the homosexual community, or a limited pool of sexual partners) experienced little or no sexual activity upon initially becoming HIV-infected, the maintenance of an active sexual life may be what affirms and continually reaffirms their identities as sexual minority men (see Gochros 1992; Halkitis et al. 2004; Bailey and Hart 2005; Bimbi and Parsons 2005; Halkitis and Wilton 2005).

Health Effects

This study highlights the role of health-related covariates in decreasing erectile function, sex drive, and sex life satisfaction. In concordance with prior research, HIV-infected men who suffer from and take medications for chronic diseases are likely to experience decreased abilities to maintain strong erections and have pleasurable sexual experiences (Feldman et al. 1994; Prisant et al. 1994; Milde et al. 1996; Kutner et al. 2000; Moreira et al. 2001; Laumann et al. 2001). This is particularly true for men with more advanced HIV infections. The combination of disease progression and medications for HIV, as well as other conditions, very well amplify sexual health problems (Catalan and Meadows 2000; Schiltz and Sandfort 2000; Colson et al. 2002; Halkitis and Wilton 2005). The persistence of this pattern over time, most notably in terms of erectile function and sex life satisfaction substantiates the effects of physical and psychosocial health as major determinants of sexual health.

However, in this sample it is noteworthy that the subjective measures of health—depression and self-reported health—have much stronger effects than does the objective measure of weighted comorbidities. Additionally, depression is the only health-related covariate consistently related to negative sexual health outcomes. This pattern is also apparent over time, especially in the decline of erectile function. These findings suggest that the way HIV-infected men *think* of their own health may be just as salient in the etiology of sexual health as are objective indicators of health (e.g., doctor’s reports).

Still, as was the case with mode of transmission, ill health was not associated with a lower likelihood of having sex. To the contrary, the presence of an increased number of comorbidities is associated with men’s *initiation* of sexual activity. This finding is contrary to findings by Dupras and Moriset (1993). Perhaps men with ill physical and mental health, despite the arousal and satisfaction problems that they encounter, use sex to help them cope with the frustration of ill health. They may use sex as a way to validate themselves in light of their declines in health and well-being. This is especially true for younger men, for whom sex generally carries more meaning (Halkitis et al. 2004). Additionally, to the extent that societal norms are changing in favor of being “sex-positive,” even for HIV-infected men, sex may be perceived as a means to better health and psychological functioning (Schiltz and Sandfort 2000). On the other hand, men in my sample were generally healthy and had less depression than HIV-infected men in other samples (Radloff 1977; Mayne et al. 1996; Lyon and Younger 2001; Perdue et al. 2003). This suggests that the effects of physical and mental health upon sex may vary depending upon the extent to which samples of HIV-infected men exhibit ill health.

Substance Effects

Although substance use covariates poorly performed as correlates of sexual health for my sample, the fact that alcohol use was positively related to several indicators warrants comment.

For my participants, alcohol use did not occur to the point of excess. On average, the men drank about one drink about three days a week. As others have suggested, it is likely that HIV-infected men rely upon moderate alcohol use in order to “set the mood” for sexual activity (Cove and Petrak 2004). In addition, alcohol may help to relax them so that they feel more comfortable engaging in sexual activity. It decreases the men’s inhibitions, which possibly results in them having an increased libido, as was the case for my participants. Findings from both population-level and HIV-infected samples support this line of reasoning (Rimm et al. 2000; Moreira et al. 2002; Bacon et al. 2003; Bimbi and Parsons 2005; Purcell et al. 2005b).

Yet, I make this argument with caution. As my findings demonstrate, moderate alcohol use may do nothing for promoting better erectile function, and it may lead to a cessation of sexual activity over extended periods of time. While moderate drinking may serve HIV-infected men as an enhancer to sexual mood—thus, increasing the likelihood of sexual contact and, consequently, satisfaction with sex—erectile function is likely to remain unchanged by it. For reasons not explorable in this study, men who drink even moderately may be prone to cease sexual activity. Amid heavier drinking, erectile function and sexual activity are likely to suffer a great deal, especially as drinking occurs over extended periods of time (Masters et al. 1986; Feldman et al. 1994; Laumann et al. 2001).

The use of tobacco did not negatively affect the likelihood of having sex, erectile function, sex drive, or sex life satisfaction for my sample of HIV-infected men. To the contrary, tobacco use unexpectedly exhibits a positive association with sex life satisfaction (cross-sectionally) and sex drive (longitudinally). I present several explanations for these findings. Tobacco is likely acting as buffers to stress, which is implicated as a contributor to a host of sexual problems (Laumann et al. 1994, 2001). Therefore, the finding that men who smoke experience some

modest improvements, at least in a subjective sense, is not completely unlikely. Second, HIV-infected men have elevated stress levels, yet exhibit a reversed pattern of tobacco use than does the general population (smoking is the norm; see Burkhalter et al. 2005; Miguez-Burbano et al. 2005). Third, HIV-infected men are qualitatively different, due to the increases in stress and changes in overall life situations, than men in the general population, for whom well-established findings have validated the negative effects of tobacco use (Feldman et al. 1994; Mannino et al. 1994; Gentili and Mulligan 1998; Bacon et al. 2003). Fourth, the findings regarding the effects of tobacco tend to evaluate tobacco use in samples of men who used tobacco over extended periods of time or are among the aged; they typically focus on erectile function as the sole indicator of sexual health. This study does not test for long-term effects, and the evident effects in my sample do not apply to erectile function. And, finally, the use of tobacco in the etiology of sexual problems is not *completely* conclusive as some studies have found no effects (Moreira et al. 2002; Gazzaruso et al. 2004).

My findings on the use of illicit substances is suggestive that the use of these substances, provided that it is moderate (which is the case for my sample), may not present as many sexual difficulties as expected. To the contrary, HIV-infected men are likely to experience significant improvements on some indicators of sexual health (i.e., erectile function). Though illicit drug use in HIV-infected men is likely to result in a greater number of arousal, orgasmic, and erectile over *extended* periods of time, the short-term effects can indeed be positive. Palha and Esteves (2002) comment that during the early phases (approximately the first six months) of the use of opioids, some men experience decreases in orgasm-related difficulties. For this reason, HIV-infected men, who, upon using illicit substances witness improvements in erectile quality, libido, and orgasm, are likely to continue usage.

Men in my sample who used substances at one time point were more likely than non-users to begin having sex at the following time point. It is quite probable, therefore, that illicit substance use acts as a motivator for sexual activity by way of, as seen above, improved erectile function. Others offer support for this line of reasoning (Goldberg et al. 1993; Palha and Esteves 2002; Theodore et al. 1994). Such an outcome may be especially salient for HIV-infected gay and bisexual men, who, due to the nature of commercial sex venues and sexual sub-cultures catering to non-heterosexual men, may present drugs in order to attract sexual partners and enhance the quality of their sexual experiences (Wagner et al. 1997; Bimbi and Parsons 2005; Purcell et al. 2005b). With improvements in erectile function being rather visible, the likelihood of having sex dramatically increases. The non-association of substance use to sexual health indicators witnessed at the cross-sectional level is perhaps a balance between the positive and negative outcomes of substance use.

Implications for Practice

This thesis has demonstrated the role that sociodemographic, health-related, and substance use correlates play in the etiology of sexual health outcomes for HIV-infected men. Conceptualized to include self-reports of sexual activity, function, drive, and satisfaction, sexual health in this sample proved to be both dynamic and stable. While most men tended to maintain their levels of sexual health over time, group-level change tended to be affected by the relevant covariates that I proposed in this thesis. I conclude by offering several recommendations to inform medical and public health practice.

Among HIV-infected men, those who are older, sicker, and acquired HIV via homosexual contact are those who are most at risk for encountering erectile difficulties and lower ratings for sexual experiences. Though this study did not focus on sexual risk, several researchers have noted that due to decreased sexual sensitivity, erectile dysfunction may result in men not using

condoms during sexual intercourse (Rosser et al. 1997; Richters et al. 2003; Cove and Petrak 2004; Bancroft et al. 2005; Purcell et al. 2005). For this reason, men who suffer from erectile problems may benefit from the use of sexual enhancements, such as Viagra. Efforts should be made to ensure that sexual enhancements are used with caution (see Wagner et al. 1997). These men, especially those engaging in homosexual sex, should be encouraged to maintain the use of condoms and withdrawal prior to ejaculation as the use of Viagra has been found to be associated with increased rates of unprotected sex (Kim, Kent, and Klausner 2002). The risks that result from the use of sexual enhancements, however, may not be as applicable to HIV-infected men who, like men in my sample, do not live in large urban centers with well-developed sexual subcultures conducive to sexual risk (Kippax et al. 1998).

Sex may be a grave reality for HIV-infected men, most notably among those who are younger, cohabiters, and moderate drinkers. For this reason, HIV-infected men may benefit from serosorting, a process by which they choose partners who are also HIV-infected. Though not effective against other sexually transmitted infections (STIs), serosorting has proven effective against the spread of HIV within some populations of high risk men (AIDS Alert 2004; Mao et al. 2006; see also Wolitski 2005). Men and their partners should be encouraged to get tested together for other STIs prior to engaging in any unprotected sexual activities. Health professionals who work with high risk men not infected with HIV may also find that encouraging serosorting may help prevent subsequent seroconversions (Parsons et al. 2005).

When assessing sexual health among HIV-infected men, health professionals should be extremely clear in the questions asked of these men. For example, instead of asking the men “did you have sex within the past 30 days,” a better question might be, “did you place your penis in anyone’s vagina or anus within the past 30 days.” Questions should also be specific to a range

of activities including all types of intercourse, mutual masturbation, receptive and insertive oral-genital contact, and petting. As this thesis suggests, sex may mean very different things to different people. For example, older men may be content with not having sexual intercourse if they have the availability of other modes of sexual contact, such as mutual masturbation and oral sex. For this reason, a wider assessment of sexual behaviors will result in a better understanding of the reasons some HIV-infected men rate their sexual health differently than others.

Moreover, the racial/ethnic findings gathered from clinical data sources may somewhat differ from results that are anticipated based upon population-level, probabilistic data sources. Due to the limited distribution of behavioral risks, poverty, and, to a lesser extent, geography among those infected with HIV, HIV-infected men are likely to be more alike than are men in the general population. Therefore, the racial/ethnic variation in sexual health outcomes observed in population-level studies may be diminished in clinical studies. In some ways, as was the case with sex life satisfaction in this study, race/ethnic minority status may result in increased sexual health outcomes. Health professionals working with HIV-infected men should, therefore, be aware of this and note that the sexual health of non-white men may not fare as bad as some literatures suggest. In addition, future studies may benefit from the recruitment of high numbers of non-Hispanic blacks, Hispanics, and Asian/Pacific Islanders so that sub-sample analyses can be conducted.

Health professionals that serve HIV-infected gay and bisexual men should realize that they are quite vulnerable to sexual health problems and, over time, may not experience improvements in sexual health as do some heterosexual men. My findings further suggest that sexual contact remains vitally important for them, despite their lower levels of erectile function, sex drive, and sex life satisfaction. Health professionals should encourage gay and bisexual men to abstain

from behaviors (e.g., methamphetamine and tobacco use) that, while quite prevalent in communities of gay and bisexual men, decrease sexual health outcomes over extended periods of use. Gay and bisexual men in relationships may benefit from sexual therapy with their partners (see Bahr and Weeks 1989). For professionals who work with MSM of color and other MSM who do not readily identify as gay or bisexual, their mode of HIV transmission, which is typically known, may suffice as a proxy for sexual orientation as this study has demonstrated (see also Malebranche 2003).

Last, short-term legal and illicit substance use may produce some positive sexual health outcomes for HIV-infected men. Therefore, men who currently use these substances may not wish to abandon usage once these outcomes are realized. Health professionals should seek to inform HIV-infected men of the dangers of long-term substance use for their physical, psychological, and sexual health. As some men may use drugs solely to enhance sexual pleasure and erections, prescribing Viagra and/or other sexual enhancements may result in them abandoning the use of other drugs. As some have demonstrated, these men may benefit from counseling and treatment programs; such programs may, in turn, promote the consistent use of condoms (see Frosch et al. 1996).

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BIOGRAPHICAL SKETCH

William Lyman Jeffries IV earned his Bachelor of Arts degree (*summa cum laude*) from Florida Southern College in 2002. He majored in sociology, criminology, and religion: Christian education. Concurrent to his enrollment as a doctoral student in the University of Florida's Department of Sociology, he is also acquiring his Master of Public Health degree through the Department of Behavioral Science and Community Health. Jeffries' research primarily examines intersections of health and sexualities, with particular foci on men's health and gender as well as racial, ethnic, and socioeconomic health disparities. He has written manuscripts on a wide range of topics including the sociology of male sexual dysfunction, the down-low phenomenon among black men, religion and spirituality in the lives of sexual minorities, and racial/ethnic differences in male sexual behaviors and identities. Jeffries is currently conducting research on sexual health outcomes of HIV-infected men living in North-Central Florida. On a separate project, he is examining sociocultural factors related to HIV/sexually transmitted infection risks and prevention among bisexual black men in New York City and Jacksonville, FL. Jeffries is the recipient of a McKnight Doctoral Fellowship and a Florida Board of Education Summer Fellowship. He was recently awarded the Excellence in Student Abstract Submissions and David Rosenstein Scholarship from the American Public Health Association's HIV/AIDS Section. His current professional memberships include the American Sociological Association, Southern Sociological Society, and American Public Health Association.