

PREVENTATIVE HEALTH TEST UTILIZATION AMONG SEXUAL MINORITIES:
A NATIONALLY REPRESENTATIVE POPULATION-BASED STUDY

by

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DEDICATION

Dad
(*malignant melanoma, 1994*)

“What a long strange trip it’s been.” - *The Grateful Dead*

See you again someday...

and

Joan Phillips
(*AIDS, 1995*)

That leopard coat and the convertible...

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ABSTRACT

Little attention has been paid to preventative medical test utilization among sexual minorities and not much attention has been paid to health issues of sexual minorities except in high profile diseases such as HIV/AIDS. Sexual minorities often delay obtaining preventative healthcare because of various barriers such as discrimination, stigmatization within the healthcare system, and due to lack of health insurance coverage. Despite the growing visibility of the LGBTQ community and the July 2015 U.S. Supreme Court landmark decision that extended marriage equality nationwide, health disparities continue to be an ongoing issue within the sexual minority population. The importance of preventative screening is to ultimately reduce morbidity of certain diseases through testing and to identify diseases that could cause mortality if left untreated. There is only a limited number of population-based studies on health disparities among sexual minorities that specifically examine preventative health test utilization. Couching this study in the second demographic transition and the epidemiological transition theories and using the 2013 National Health Interview Survey data from the National Center for Health Statistics, which is among the first to contain nationally representative data on sexual orientation, this research compares participation in preventative health test utilization between the heterosexual and homosexual populations. This research also examines differences in preventative health test utilization among sexual minorities while controlling for confounding sociodemographic variables. Results indicate significant differences in participation levels among the

heterosexual and homosexual population in blood pressure, blood glucose, colon cancer, and HIV screenings and testing. Among the homosexual population, findings indicate significant differences in colon cancer screening and HIV testing. These findings contribute to the existing literature by providing a baseline for population-based research on sexual minorities and their utilization of preventative health tests.

CHAPTER I

Introduction

Poor health within the homosexual population persists because of discrimination and stigmatization within the healthcare system. In addition, other tribulations such as lack of health insurance, deficiencies within social programs, often overlooking sexual minorities, and a shortage of health providers who understand unique health issues affecting sexual minorities, repeatedly impact the health of homosexuals (Cohen 2013; Lim, Brown and Kim 2014). Consequently, there is also a lack in preventative test utilization within the homosexual population. Underutilization of preventative tests may be due to a variety of reasons when compared to the heterosexual population.

Heterosexuals do not experience the same social and structural barriers to healthcare, such as lack of health insurance, higher unemployment, stigma, and discrimination. This may contribute to the increase in health disparities making it difficult for sexual minorities to gain access to or obtain healthcare in respectful environments (Mdodo et al. 2014; Stein and Bonuck 2001). Discriminatory interactions related to sexual orientation are well documented in the healthcare environment, both at interpersonal (Bernhard 2001) and at the institutional levels (Ponce et al. 2010). As a result, sexual minorities are more likely to delay needed care (Buchmueller and Carpenter 2010) and access preventative health measures. Due to the high prevalence of lack of preventative healthcare, sexual minorities are at a higher risk for diseases leading to co-morbidity and overall poorer health.

Sexual minorities are an understudied in population-based samples with respect to preventative test utilization. The importance of preventative screening is to ultimately

reduce individual morbidity of certain diseases through testing and to identify diseases that could lead to mortality if left unknown or untreated. The primary outcome is disease prevention or reduction. For example, most cases of prostate cancer have a good prognosis even without treatment, but other cases or types of cancer may be more aggressive and if left untreated or unknown, the incidence of mortality is much higher (Moyer 2012). In general, there is little research on sexual minority health with the available research mainly focusing on risky behaviors (Mathews et al. 2013; Moeller et al. 2014), consequences of lack of health insurance, and the relationship between sexual minority status and stress (Everett and Molborn 2013; Shilo and Mor 2014). The existing population-based studies of health test utilization of sexual minorities have been limited to human immunodeficiency (HIV), sexually transmitted diseases (STD), a small number of cancer tests such as mammography and papanicolaou (pap) (Fredriksen-Goldsen et al. 2013; Tracy, Schluterman and Greenburg 2013).

This research goes further in exploring differences in preventative health test utilization among the heterosexual and homosexual population using the 2013 public version of the National Health Interview Survey (NHIS). Further, this study examines differences between gay men and lesbians. The findings will contribute to the existing literature by providing a baseline of population-based research on sexual minorities and their utilization of preventative health tests.

CHAPTER II

Literature Review

Unique Health Disparities

Compared to the general heterosexual population, gay men and lesbians may have poorer health due to social stigmatization. Some of these health concerns are potentially linked to the effects of heteronormativity and delaying healthcare due to homosexual stigmatization (Strutz, Herring, and Halpern 2015). Heteronormativity is a term used by social theorists whereby gender and sexuality are separated into hierarchical organized categories. It is used to describe a culturally entrenched belief system which assumes heterosexuality is the norm. Heterosexism is a system of attitudes, bias, and discrimination in favor of opposite-sex sexuality concluding that opposite-sex attraction and relationships are the only norm and therefore superior (Jung and Smith 1993). Heterosexism and heteronormativity have permeated health institutions as a result of prejudice and bias originating from these socially constructed concepts. The consequences of such prejudice often have damaging effects on the lives and well-being of individuals who do not fit into the dominant heterosexual framework within society (Enson 2015).

Individual health risks are shaped by many factors beyond sexual orientation and practice, to include family history and age. However, sexual minority women and men have some specific health concerns. Lesbians have an increased risk for various cancers, obesity-related morbidity, poorer mental health, and substance abuse problems, mainly tobacco and alcohol abuse (Cochran, Sullivan, and Mays 2003; Boehmer, Bowen, and Bauer 2007). In addition, research from the 1997-2003 National Health Interview

Survey demonstrated that women in same-sex relationships were at significantly greater risk for fatal breast cancer than women in heterosexual relationships (Cochran and Mays 2012).

Gay men may have a greater need for medical services than their heterosexual counterparts. Increased health disparities found among gay men are related to risky behaviors such as smoking, (McKirnan et al. 2006), nonprescribed drug use (Trocki, Drabble and Midnanik 2009), and alcohol abuse (Drabble, Midanik and Trocki 2005). They are more likely to suffer from frequent panic attacks, depression, and other mental health disorders (Cochran et al. 2003). In addition, they are at greater risk for HIV and STD infections, especially when many delay testing due to lack of healthcare access or stigma (Gonzalez et al. 2009).

Challenges in Healthcare Obtainment

In order to appreciate the lack of preventative test utilization among sexual minorities, it is imperative that there is an understanding of the contributing factors. Two consistent themes arise from the literature in regards to decreased preventative test obtainment. The first is systemic medical institutional homophobia, historically resulting in discrimination and stereotyping, leading to delays in healthcare and concealment of sexual orientation. This also includes healthcare providers' lack of understanding or knowledge of the unique health issues that sexual minorities endure. The second is lack of health insurance coverage compared to the heterosexual population.

Stigmatization

Homophobia and heterosexism are the most common forms of discrimination in healthcare for sexual minorities (Brotman et al. 2002). Whether the homophobia is real or perceived, it contributes to the lower rates in healthcare access for all sexual minorities (Polek, Hardie, and Crowley 2008). One consequence of real and perceived homophobia is that sexual minorities avoid visiting healthcare providers or, if they do see a provider, they often hold back personal information that is pertinent to receiving quality healthcare (Bjorkman and Malterud 2009; Clark et al. 2001; Institute of Medicine 2011). Through lack of culturally sensitive treatment, health professionals are failing to properly care for this population, continuing a legacy of health disparities historically experienced by homosexuals (Rounds, Burns-McGrath and Walsh 2013).

Lesbians reported more delays in seeking healthcare because of sexuality issues and fear of discrimination (van Dam and Dull 2001). Knowing a patient's sexual orientation allows the healthcare provider the ability for customized care (St. Pierre 2012). Mosack, Brouwer, and Petroll's (2013) study found that when healthcare providers knew of sexual orientation, there was greater healthcare satisfaction with their provider and treatment (Mosack et al. 2013). However, homophobia has created a barrier to disclosure, resulting in healthcare problems (Polek et al. 2008). Lesbians were significantly less likely to have visited a health professional in the past 12 months and were significantly more likely to have unmet medical needs than were women in different-sex relationships (Heck, Sell and Gorin 2006).

Using data from the Washington State Behavioral Risk Factor Surveillance System 2003-2010, Fredrikson-Goldsen et al. (2013) examined screening behaviors,

accessibility to care, chronic conditions, and health outcomes by gender and sexual orientation. The findings for screening behaviors revealed that lesbians were less likely to have had a mammogram when compared to heterosexual women; however, they were more likely to have had an HIV test when compared to heterosexual women. Likewise, gay men were more likely to have had an HIV test. Initially, they found that gay men were significantly less likely than heterosexual men to participate in prostate specific antigen (PSA) testing. However, after adjusting for sociodemographic characteristics, there were no differences among heterosexual and homosexual men (Fredrikson-Goldsen et al. 2013). However, this data from the Washington State Behavioral Risk Factor Surveillance System does not adequately represent the United States' homosexual population. This unique location has longer standing homosexual visibility and increased acceptance, which must be considered when interpreting findings.

Health Insurance

Health insurance coverage is a major factor determining healthcare obtainment, including preventative health tests. The lack of health insurance due to uneven access to domestic partner benefits in many states has substantially contributed to the decline in utilizing healthcare (Ash and Badgett 2006). Ash and Badgett's research found that individuals in same-sex relationships were significantly less likely to have health insurance coverage than were married individuals in different-sex relationships. Similar to Ash and Badgett's 2006 research, Heck et al. (2006) found that women in same-sex relationships were significantly less likely to have health insurance coverage. However, they also found significant differences in insurance coverage or unmet medical needs for men in same-sex relationships compared with men in opposite-sex relationships (Heck et

al. 2006). The Washington State Behavioral Risk Factor Surveillance System survey found that lesbians and bisexual women were less likely than heterosexual women to have health insurance coverage and more likely to experience financial barriers to healthcare. Gay men were less likely to have health insurance coverage when compared to heterosexual men, but this result was not significant after sociodemographic adjustment (Fredriksen-Goldsen et al. 2013). Again, as stated earlier, Washington state is a unique geographical location seen as more homosexual friendly. However, findings from Pals and Waren 2014 study using the 2009 American Community Survey, comparing lesbians in partnerships in “gay-tolerant” states versus other states, revealed that women in same-sex partnerships consistently had lower rates of health insurance coverage than married women in opposite-sex partnerships. This study also found that state-level variation in gay tolerance did not contribute to the access or type of coverage used by women in same-sex partnerships. Although this was a nationally representative population-based study, ACS did not directly ask questions concerning sexual orientation or sexual identity and identified lesbian women by their relationship to the householder and the sex of that householder (Pals and Waren 2014).

Preventative Tests

Overall, the research shows that test utilization among sexual minorities is less prevalent among heterosexual men and women, with HIV and some STD tests as the exceptions (Everett and Mollborn 2014; Dolan and Davis 2008; Heslin et al. 2015). The literature on other preventative test utilization is sparse, especially expanding outside of tests, such as mammography, HIV, and tests that often require no insurance coverage.

Although literature often focuses on the mortality and morbidity of diseases among sexual minorities, for example, HIV, diabetes, and some types of cancers, few studies examine preventative health test utilization. In this research, preventative tests are grouped together based on accessibility and those requiring a physician referral. This not only serves as a method of organization, but also for future evaluation, exploring various relationships between preventative test utilization and sexual orientation. The preventative tests can be divided into three categories: easy to access tests, physician referral tests, and HIV tests.

Easy to Access Tests

Ease of accessibility tests often do not require health insurance and a doctor referral. Most often, these tests are performed at places such as Walgreens, free screening health clinics, preventative health fairs and so forth. Most of these tests may also be performed by the individual, potentially increasing the rate of preventative screening.

The first group of tests examined in this category are tests measuring blood pressure, cholesterol, and blood glucose. Gay men and women may be at risk for worse cardiovascular health outcomes than their heterosexual peers for several reasons such as lack of health insurance coverage, stigmatization, and lower access to healthcare (Everett and Mollborn 2013). Although not all sexual minorities engage in risky behaviors or have health issues such as being corpulent or sedentary, which can contribute to hypertension, some have an elevated risk of likelihood. Undetected or untreated hypertension can damage the heart, brain, eyes, and kidneys prior to clinical signs. Hypertension often leads to heart attack and heart failure, stroke, kidney failure, and

other negative health consequences (American Heart Association 2014). The research of Everett and Mollborn (2013) examined differences in hypertension by sexual orientation, and found that gay men were almost twice as likely to be hypertensive compared to heterosexual men. No differences were noted among lesbians and heterosexual women (Everett and Mollborn 2013). Additionally, HIV infection is considered a risk factor for the development of pulmonary arterial hypertension. Although hypertension among gay men has typically been discovered while undergoing antiretroviral treatment (Isasti et al. 2013), research by Pérez-Benítez et al. (2006) found a relationship between cardiovascular health and concealment of homosexual orientation. Gay men who concealed their sexual orientation were found to have greater cardiovascular recovery (ie. systolic and diastolic blood pressures returning to normal limits) after disclosing their sexual orientation. Research suggests that disclosure may result in a reduction of perceived stress, physical symptoms, and physiological responses (Pérez-Benítez et al. 2006).

High cholesterol level often precedes cardiovascular disease. Although high cholesterol is not always associated with being overweight and obesity, there are strong connections between the two. There is some suggestion that differences in obesity rates by sexual orientation may be due to the variance in social, behavioral, and cultural norms (Cochran et al. 2001). Research by Boehmer et al. (2007) found that lesbians had a higher prevalence of being overweight and obesity when compared to other female sexual orientation groups. They also found that lesbians were at greater risk for morbidity and mortality, related to being overweight and or obesity (Boehmer et al. 2007). As cholesterol screening is the gateway to early detection and control of

dyslipidemia (abnormal total cholesterol), bringing cholesterol levels under control is beneficial for all individuals, and cholesterol screening is the gateway to early detection and control of dyslipidemia. Healthy People 2020 and the Department of Health and Human Services have identified cholesterol management as a key component to preventing other diseases (Robbins et al. 2013).

As some sexual minorities may be at a higher risk of becoming diabetic due to a variety of factors that negatively influence health (Fredriksen-Goldsen et al. 2013), exploring the rate of testing for glucose within this population is important. In fact, adults with diabetes are at increased risk of being diagnosed with and dying from colorectal cancer (Miller 2014). Most of the research available on diabetes and sexual orientation focuses on the diagnosis and not preventative testing. For example, various studies have found that sexual minorities were less likely to be diagnosed with diabetes compared to their heterosexual counterparts (Blosnich and Silenzio 2013) or found no differences in diabetes diagnosis (Conron, Mimiaga and Landers 2010; Dilley et al. 2010). Examining the prevalence of preventative screening test usage may shed light on diabetes morbidity. Although there is extensive research on the prevalence of diabetes among sexual minorities, further research on preventative screening for diabetes is needed to adequately understand if screening tests are being utilized as a preventative strategy among the homosexual population.

Physician Referral Tests

Preventative cancer tests such as colorectal (CRC), PSA, sigmoidoscopy and fecal occult blood test (FOBT) most often require health insurance coverage, unless self-paying, and most likely require a physician referral. Underutilization of cancer

screening has been found especially to affect socially marginalized groups (Brown and Tracy 2008). Fecal occult blood testing may be done at a health facility or for some, completed at home with a special kit. Sigmoidoscopy (used to see inside the sigmoid colon and rectum) and colonoscopy (used to see the inner lining of the large intestine) are procedures in which a tube is inserted through the rectum to view the colon for signs of cancer such as polyps or other health problems.

The American Cancer Society provides guidelines for early detection of cancer. Colon and rectal cancer and polyps testing begins at age 50 for both men and women. Sigmoidoscopy is suggested every five years and colonoscopy every 10 years unless otherwise indicated. Fecal occult blood tests are recommended yearly. PSA screening for men begins at age 50. For women, mammograms begin at age 40 and pap tests start at age 21. These guidelines may be modified as indicated by patient status (American Cancer Society 2015*b*).

Brewer et al. (2010) conducted an online national survey where they found that fewer than half of the respondents knew that human papillomavirus (HPV) can cause anal cancer and oral cancers. However, gay and bisexual men, who are at greater risk of HPV infection, typically knew more than heterosexual men about these topics which could imply a higher expectation of preventative test utilization (Brewer et al. 2010). Research by Heslin et al. (2008) examined rates of colorectal cancer among California gay and bisexual men. This study found that gay/bisexual men had greater odds of ever receiving colorectal testing and lower odds of PSA testing than did heterosexuals (Heslin et al. 2008).

Blosnich et al.'s. (2013) research revealed that just over 59% of heterosexual men

had a PSA test and just over 55% of gay males did (Blosnich and Silenzio 2013). In contrast, Heslin et al.'s (2008) found that gay/bisexual men who lived alone had greater odds of obtaining a PSA test than other homosexual men and heterosexual men (Heslin et al. 2008). Also, gay men may have better access to CRC screening than heterosexual men, as these tests are used to diagnose problems associated with anal sex (Barnett 2004). Sexual orientation was independently associated with increased cancer testing among gay men related to HIV symptoms (Welch 2004). Research by Blosnich et al. (2014) examined health inequalities among sexual minority adults from ten U.S. states in 2010. They found that just over 72% of gay men in their study had colorectal screening compared with only 64% of heterosexual men (Blosnich et al. 2014).

Colorectal cancer is one of the most common cancers affecting U.S. women. Data on colorectal cancer screening, sexual orientation, and sociodemographics were gathered prospectively from 1989 through 2005 from 85,759 U.S. women in the Nurses' Health Study II. Fewer than half of eligible women had ever received a colonoscopy or sigmoidoscopy, and rates did not differ by sexual orientation. No differences in colorectal screening were found between heterosexual and homosexual women and adherence to colorectal screening recommendations was uniformly very low (Austin et al. 2012). Research by Brown and Tracy (2008) found only two papers that addressed colorectal cancer among lesbians and one reported that only 55 percent of the participants (N=36) were up to date with their colorectal cancer screening; of the 10 participants not up to date, only one had obtained a sigmoidoscopy within six months (Brown and Tracy 2008). Blosnich et al. (2014) found that just over 65% of

heterosexual women participated in colorectal screening, a slightly higher percent (59.3%) than lesbians (Blosnich et al. 2014).

Overall, several risk factors have been identified that put all women at an elevated risk of cancer diagnosis. Risk factors for multiple cancers appear to aggregate for lesbians, implying that the risk for lesbians developing cancer is higher than heterosexual counterparts. Aggregation of risk factors include family history, age, smoking^a, alcohol consumption^a, low/no physical activity^a, overweight^a, high-fat diet, parity^a, use of oral contraceptives/hormone therapy, multiple male sexual partners, HPV infection, and lack of screening/low rates of screening^a (Brown and Tracy 2008).

Prevention behaviors of lesbians appears to differ from heterosexual women (Brown and Tracy 2008). Sexual minority women were significantly less likely than heterosexual women to have had a mammogram (Fredricksen-Goldstein et al. 2013). Accumulative evidence on preventative health behaviors among lesbians found that they were less likely to have had a pap test in the past two to three years (Aaron et al. 2001; Kerker, Mostashari, and Thorpe 2006) and were also 2.3 times more likely to have never had a pap test (Valanis et al. 2000). Mammography screening is a particularly important issue as it has been noted that lesbians have the highest concentration of risk factors for breast cancer of any subset of women (American Cancer Society 2006). Austin et al.'s (2013) research on the prevalence of mammography testing from 1989 through 2005 found that mammography testing in the past two years was common (though not universal) and differed only slightly by sexual orientation, heterosexual 84 percent and lesbian 82 percent (Austin et al. 2013). Results from the Cancer Screening Project for

^a Indicates risk factor for which lesbians have higher prevalence rates

Women (2003-2005) found that women who reported ever putting off, avoiding, or changing the place of screenings because of sexual orientation were less likely to be on-schedule for comprehensive screening (breast, cervical, and colorectal). However, only six percent of the respondents put off, avoided, or changed the place of various cancer screenings due to sexual orientation. Thus, the influence of self-reported barriers to screening, such as problems taking time off from work, problems with transportation, medical problems, responsibilities for dependants, body image, and disability, were more likely to influence preventative test utilization (Clark et al. 2009).

HIV Tests

HIV testing has received great attention, in the wake of the HIV/AIDS crisis beginning in the 1980s (Valdiserri 2011). Due to this epidemic, gay men had elevated test utilization. However, as it has been over 30 years since the beginning of the HIV/AIDS epidemic in America, some scholars claim that HIV testing has become normalized (Flowers et al. 2013). In research using online and offline sexual health-seeking patterns among HIV-negative men who have sex with men in 2010, it was found that despite widespread urban implementation of HIV-prevention services, there was very little published on the utilization of these services (Wilkerson et al. 2010). Within the current literature, there is some ambiguity in HIV testing utilization among gay men. About 76% of gay and bisexual men had a HIV test as opposed to heterosexual men in their lifetime (23.89%) (Fredricksen-Goldsen et al. 2013). Likewise, just over 81% of gay men had a HIV test within the last year when compared with just over 35% of heterosexual males (Blosnich et al. 2014). A 2013 study by Chakravarty et al. examined testing rates among HIV-negative homosexual men (N=752) in partnerships and

approximately half of those men had been tested for HIV within the past year. Among the homosexual men in their sample who had engaged in risky sexual risk behavior in the past three months, 27 percent tested within that period and 65 percent within the past year. For men in seroconcordant relationships these rates were 25 and 60 percent respectively and for men in serodiscordant relationships they were 34 and 72 percent (Chakravarty et al. 2012). A 2008 Centers for Disease Control and Prevention (CDC) nationwide study of HIV negative gay men, sixty-one percent reported being tested for HIV within the past year (CDC 2011). According to Chakravarty et al. (2012), the difference between the 2008 CDC findings and their findings may be related to HIV-negative men in long term serodiscordant relationships adapting to risk reducing strategies and/or the perception of being less susceptible to HIV (Chakravarty et al. 2012).

Although it is a common misconception among some women that have sex with women that their risk of HIV is low, testing is still vitally important. This is especially true for women in previous heterosexual relationships. Research from the 1990s reported that many HIV-positive women reported having sex with other women (Bevier et al. 1995). In addition, women who have sex with women are often unaware of the risk of HIV infection (Taylor 1999). The research on HIV testing among lesbians is increasing and much of the research shows over 50 percent of the women who have sex with women have been tested for HIV (Dolan and Davis 2008). Frederick-Goldstein et al. (2013) found that just over 40 percent of the lesbians in their study were tested for HIV, as only about 24 percent of heterosexual women had been tested (Fredrick-Goldstein et al. 2013). Similar findings revealed that just over 50% of lesbians had an

HIV test within the last year, as apposed to 43% of heterosexual women (Blosnich et al. 2014).

The elevated health risks among homosexuals are largely attributed to them being a historically disadvantaged population. Some of the factors are stigmatization and societal discrimination that contribute to the delay or lack of healthcare. Homosexuals are an underserved population with increased odds of diseases which have been largely ignored or neglected. Healthcare research on homosexuals has largely focused on the actual number of diagnosed diseases or contributing factors to disease and comorbidity. Little research has focused on prevention of diseases except HIV and some cancers.

Most studies on lesbian, gay, bisexual, transgender, and queer (LGBTQ) populations have focused on risky behaviors and conditions but little is known about preventative testing utilization. In the category of easy to access tests, there are mixed findings for diabetes testing among heterosexual and homosexuals. Much of the research on blood pressure and cholesterol has focused on diagnosis and increased likelihood of mortality in relation to sexual minority status. For physician referral tests, much of the past research has used the umbrella term colorectal screening, as opposed to individual cancer screening tests such as colonoscopy, sigmoidoscopy, and so forth. Among the small body of literature available, homosexual men were more likely to participate in colorectal screening than of heterosexual men. However, research by Kamen et al. (2014), found that although gay men were more likely to report a lifetime history of cancer (multiple types) diagnosis than heterosexual men, this finding was attenuated when they accounted for the weakened immune system proxy variable. This suggested that causes of cancer diagnosis disparities, such as preventative test utilization,

existed for gay men (Kamen et al. 2014). The findings for PSA test utilization among heterosexual and homosexual men are mixed.

Among women, lesbians were less likely to participate in colorectal screening than heterosexual women. There are mixed findings about mammography and pap testing among heterosexual and homosexual women. Overall, the literature shows that sexual minorities are more likely to participate in HIV testing than heterosexual men and women. Additional research is needed on preventive test utilization due to increased disease incidence related to sexual minority status. This may assist in developing strategies, including social and structural interventions, that will better serve the LGBTQ community, thus decreasing morbidity and mortality and improving their health.

CHAPTER III

Theoretical Framework

The second demographic transition theory and the epidemiological transition theory will provide the theoretical framework for this study. Changes in values and attitudes related to family life, childbearing, and sexuality are part of the second demographic transition (van de Kaa 2004). In the second demographic transition, close attention is paid to the importance of disadvantaged social groups and the spread of some of the new types of trends and family formation, for example, non-marital childbearing and, in many cases, cohabitation. The second demographic transition emerged from the women's rights movement that led to increased opportunities in education and employment. This impacted various demographic outcomes such as delays in age of first marriage and first birth (Lesthaeghe 2014; Lesthaeghe and Neels 2002). The increase in women's rights, along with various changes in societal values and attitudes helped pave the way towards gay rights as well.

Various progressive changes focusing on the rights of the LGBTQ community are seen at the state, national, and societal level and have great potential to influence and contribute to the acceptance and normalization of the LGBTQ community. At the national level, two of the greatest strides for the LGBTQ community were the repeal of the U.S. armed forces "Don't Ask, Don't Tell" policy and the overruling of Section Three of the Defense of Marriage Act (DOMA) by the U.S. Supreme Court. At the societal level, public opinion of the LGBTQ community has become more favorable and the LGBTQ population is being recognized as a demographic group in an increased number

of nationally representative surveys (NHIS 2014; Everett and Molborn 2013; Tracy et al. 2013).

President Obama signed the Don't Ask, Don't Tell Repeal Act of 2010, which effectively eliminated all restrictions prohibiting homosexual individuals from openly serving in the U.S. military (HR 2965; S4023). Preceding this decision, sexual minorities had to remain silent or lie about their sexual orientation because of policies that excluded homosexuals from the U.S. armed forces (10 USC § 654). Gay service members were often discriminated against, systematically persecuted, and promptly separated from the military when their sexual orientation became public (Chauncey 1989; Haggerty 2003; Murphy 1988; Shilts 1993). Although there are discrepancies and contradictory reports on the numbers of service people relieved of duty due to sexual orientation, it is generally agreed that more than 13,000 gay and lesbians were released since "Don't Ask, Don't Tell" was established (Glauser 2011).

In October 2013, the Court's ruling in *United States v. Windsor*, resulted in section three of the DOMA being struck down and found unconstitutional by the U.S. Supreme Court, legalizing same-sex marriage (Harper and Breathitt 2015). This meant that same-sex couples who were married in states where same-sex marriages were legal would receive the same treatment under federal law as married opposite-sex couples (Howe 2015). The Supreme Court in January 2015 agreed to decide whether the Fourteenth Amendment required all states to allow gay and lesbian couples to marry. On June 26, 2015, the U.S. Supreme Court issued a landmark decision in *Obergefell v. Hodges*, extending marriage equality nationwide. Justice Anthony M. Kennedy delivered the opinion for the 5-4 majority. The Court held that the Due Process Clause of the

Fourteenth Amendment guarantees the right to marry as one of the fundamental liberties it protects, and that analysis applies to same-sex couples in the same manner as it does to opposite-sex couples. Judicial precedent has held that the right to marry is a fundamental liberty because it is inherent to the concept of individual autonomy, it protects the most intimate association between two people, it safeguards children and families by according legal recognition to building a home and raising children, and it has historically been recognized as the keystone of social order. Because there are no differences between a same-sex union and an opposite-sex union with respect to these principles, the exclusion of same-sex couples from the right to marry violates the Due Process Clause of the Fourteenth Amendment (*Obergefell v. Hodges* 2015).

It is well documented that marriage provides both physical and psychological health benefits (Carr and Springer 2010). Various benefits may include a spouse's pension, bereavement leave, immigration, employee insurance coverage for family members, medical decisions on behalf of partner, sick leave to care for partner, social security benefits, tax breaks, and visitation rights, and visitation of partner in a hospital or prison. Thus, now that same-sex couples have the choice of being married, it gives them access to the social support that already facilitates and strengthens heterosexual marriages, and psychological and physical health benefits associated with that support (Badgett 2009). The legalization of same-sex marriage may have positive effects on daily life, health and welfare of LGBTQ people, but it is unclear if public policy changes will significantly change the way LGBTQ people are treated in the United States. The main theories about why LGBTQ people and other minority groups are affected by health disparities involves something called "minority stress," (Meyer 1995) which reflects the

daily problem of discrimination and societal exclusion. It is less clear, that the same-sex marriage decision represents a significant change in the way LGBTQ people will be treated in the United States (Landers 2015), specifically within the healthcare system.

Another advancement for the homosexual population is the inclusion of sexual orientation in nationally representative population-based studies. The 2013 National Health Interview Survey was the first year that sexual orientation questions were included (NHIS 2014). As of 2014, the U.S. Census Bureau did not directly ask about same-sex marriage or partnerships, however, bureau officials are testing new marriage and relationship questions on its surveys in hopes of producing more accurate numbers in the next few years (Cohen 2014). In addition, societal opinion concerning many aspects of the LGBTQ community has been steadily changing. According to the Pew Research Center in June 2015, a majority of Americans favored (57%) allowing same-sex marriage and 39% opposed. Five years prior, more opposed (48%) same-sex marriage than supported it (42%). Overall, attitudes on same-sex marriage have improved by generation, religious affiliation, political party and ideology, race, and gender (Pew Research Center 2015).

As a result of national and societal progress, gay relations are gaining legitimacy. As society continues to accept LGBTQ relationships, stigma associated with these relationships is expected to decline, which in turn, may produce positive health outcomes. Legalized same-sex marriage is expected to result in more people accessing healthcare because of an expected rise in the numbers insured. Reduced stigma allows for better communication between gay patients and their healthcare providers leading to better

experiences with the healthcare system. The ultimate goal is improving the lives of sexual minorities.

Proposition four of Omran's epidemiological transition theory states: "The shifts in health and disease patterns that characterized the epidemiological transition are closely associated with the demographic and socioeconomic transition that constituted modernization complex" (Omran 2001). Health transitions are "a dynamic process whereby the health and disease patterns of a society evolve in diverse ways as a response to broader demographic, socioeconomic, technological, political, cultural and biological changes," (Santosa et al. 2014). The concept of health transitions provides a wider framework that includes not only epidemiological characteristics, but also the ways that societies respond to changing health situations as a result of cultural, social, and behavioral determinants. In this regard, increased acceptance of homosexuality and increased rights of homosexuals are expected to produce better health outcomes in the form of increased accessibility related to health insurance coverage. Preventative test utilization increases the likelihood of better health outcomes, as early detection of disease may decrease co-morbidity and mortality once diagnosed and treated. Due to a decrease in social stigmatization and increased acceptance of sexual minorities, healthcare providers may become more educated in various health disparities related to sexual minority status.

The evolution in public perception of sexual minorities in the United States has contributed to demographic change as LGBTQ people became more visible (Eaklor 2008). The demographic landscape of sexual minorities has been misunderstood and understudied. Fifty years ago, an executive order banned sexual minorities from federal

employment and public attitude towards same-sex marriage was overwhelmingly negative (Denney and Gorman 2014). Increased visibility of LGBTQ people may facilitate change in the perception of homosexuals which may further impact public policy, including healthcare. The rationale for regular reporting on health disparities and inequalities has been identified by the CDC and has emphasized the importance of sexual orientation data collection (Truman et al. 2011). At the local level, some institutions emphasize providing culturally competent care by addressing healthcare disparities in the LGBTQ population and are addressing the lack of nursing and physician curricula in LGBTQ health (Lim et al. 2014). Although healthcare disparities affecting the LGBTQ population are closely tied to sexual and social stigma and continue to prevail, increased societal attention and policy changes have the potential to produce better health outcomes within the homosexual population.

CHAPTER IV

Study Purpose

The Centers for Disease Control and Prevention and *Healthy People 2020* identify LGBTQ health inequities as one of the main gaps in current health research (Truman et al. 2011; Cohen 2013). In general, the common research foci are specific diseases and risky behaviors among sexual minorities. The studies reviewed revealed important differences in health between homosexual adults and their heterosexual counterparts including the elevated risks among lesbians due to poorer mental health, smoking, excessive drinking, and higher rates of obesity (Dilley et al. 2010; Conron et al. 2010; Boehmer et al. 2007). However, there is a lack of research on preventative screening among sexual minorities.

Early research on sexual minorities generally used convenience samples of gays and lesbians, often from community places or clinician referrals. Many large scale surveys rarely asked questions about sexual minorities or sexual orientation (Marrazzo et al. 2001). Current research on sexual minority healthcare continues to suffer from sampling limitations, which compromise the ability to make population-wide inferences about sexual orientation disparities in healthcare use (Everett and Mollborn 2014). It is largely based upon qualitative data and convenience samples, or has only allowed researchers to examine sexual minority status by measuring whether individuals are in same-sex relationships (Buchmueller and Carpenter 2010; Heck, Sell and Gorin 2006). Population-based studies often use information on same-sex cohabitation to identify sexual minorities (Buchmueller and Carpenter 2010). Using only relationship status to identify sexual minority population is problematic as it excludes sexual minorities who are not in cohabiting same-sex relationships. A large segment of the young adult sexual

minority population may be unaccounted for (Everett and Mollborn 2014). Currently, some population-based studies ask specific sexual orientation questions (Ward et al. 2014; Battle, Pastrana and Daniels 2010) containing a wealth of information, but are comprised of small sample sizes or unique geographical areas of larger homosexual populations (Fredriksen-Goldsen et al. 2013). This may contribute to the difficulty in capturing the experiences of those outside of these areas, thus not providing an accurate representation of the homosexual population in the U.S. Standardized reporting of sexual orientation in national based surveys is necessary for accurate analysis with the aim of attenuation of health inequalities among marginalized groups (Truman et al. 2011).

The existing research suggests that there are disparities in preventative health utilization among sexual minorities. It is unclear if this is found among all sexual orientation identities across the U.S. This study adds to the literature of current population-based studies by analyzing differences in preventative test utilization by sexual orientation. In this study the focus is on: a) tests that do not typically require health insurance or other monetary contributions, and b) others that do require physician referral and health insurance.

As discussed earlier, heterosexism and heteronormativity exist within society and more specifically, in healthcare establishments as a result of prejudice and bias originating from socially constructed concepts that are deeply embedded in American culture. Such prejudices have damaging effects on the lives of people who do not fit within the dominant heterosexual framework. Population-based research on

preventative health utilization will continue to be a useful tool in ways to address these inequalities.

Due to the dearth of population-based information on sexual minority preventative test utilization, conflicting results, challenges with methodology, and the unique health outcomes among sexual minorities, there is a need for data that addresses these deficiencies. The National Health Interview Survey allows comparative analysis of health disparities, in preventative tests obtainment, as it contains information on the sexual minority population. The research question that will be addressed in this study is: Is there variation in preventative health test obtainment based on sexual orientation? Based on existing literature I have come up with two general hypotheses regarding the relationship between sexual orientation and preventative test utilization.

- H1: Homosexual men and women are less likely to utilize preventative health tests, excluding HIV testing, when compared to their heterosexual counterparts.
- H2: Lesbians are less likely to utilize the preventative health tests measured in this analysis when compared to gay men.

CHAPTER V

Methodology

This study used cross-sectional secondary data from the 2013 National Health Interview Survey that was collected by the National Center for Health Statistics (NCHS) which is part of the CDC. Starting in 2013, NHIS included questions to ascertain the sexual orientation of respondents. The NHIS data have been widely used throughout the Department of Health and Human Services to monitor trends in illness and disability and to track progress toward achieving national health objectives. The data were also used by the public health research community for epidemiological and policy analysis of such timely issues as identification of those with various health problems, determining barriers to accessing and using appropriate healthcare, and evaluating federal health programs (NHIS 2014). Sampling and household interviewing were conducted throughout the year. The sampling plan followed a multistage area probability design that permitted the representative sampling of households and non-institutional group quarters (NCHS 2013). Core questions were divided into three components: Family, Sample Adult, and Sample Child. Data were collected by trained interviewers with the U.S. Census Bureau using computer-assisted personal interviewing. When necessary, interviewers completed missing portions of the interview over the phone. The Sample Adult and Family core questions were used in this analysis by merging the two datasets together via a household serial number. The Sample Child dataset was unnecessary for this research, thus not included. Combining these two datasets allowed for additional data on health status and medical conditions, health behaviors, functions and disability, and access to and utilization of healthcare services (Ward et al. 2014).

The analytical sample size comprising of adults 18 and over was 33,117. Stratified sampling was used to collect the data. The public use version of unweighted data were used for analysis. The demographic breakdown of the sample reasonably reflected the U.S. population.

The key dependent variable in this research was utilization of preventative health tests. Respondents were asked about screening for blood pressure, cholesterol, blood glucose, colon cancer tests, PSA, colonoscopy, sigmoidoscopy, FOBT, pap, and mammography in the past 12 months. Answers were “yes” or “no.” Respondents were also asked whether or not they participated in HIV screening within their lifetime.

Preventative test utilization was divided into three categories, *easy to access*, *physician referral*, and *HIV tests* for ease of interpretation. *Easy to access* tests were blood pressure, cholesterol, and glucose. *Physician referral tests* were colon cancer screening [also referred to as colorectal cancer screening (CRC)], PSA, colonoscopy, sigmoidoscopy, FOBT, mammography, and pap. The colon cancer tests are often comprised of one or multiple tests such as CRC, FOBT, colonoscopy and/or sigmoidoscopy. Fecal occult blood tests use a special at home kit to determine whether the stool contains blood. A sigmoidoscopy and colonoscopy are exams in which a tube is inserted in the rectum to view the colon for signs of cancer or other health problems. These tests were only asked of respondents 40 years and older. Mammography screening was only asked of respondents 30 years or older. All other screenings were available to respondents 18 or older.

The key independent variable is sexual orientation and was created from the first of four sexual orientation questions: “Which of the following best represents how you

think of yourself?” For male respondents, they were: (1) Gay, (2) Straight, that is, not gay, (3) Bisexual, (4) Something else, and (5) I don’t know the answer. For female respondents, the response options were: (1) Lesbian or gay, (2) Straight, that is, not lesbian or gay, (3) Bisexual, (4) Something else, and (5) I don’t know the answer. For the purposes of this research, gay, lesbian, and heterosexual identities were created from the data. They are: (1) Heterosexual male, (2) Gay male, (3) Lesbian, and (4) Heterosexual female. All of the variables were recoded into dummy variables for use in the regression analyses. Heterosexual men were the reference category when all sexual orientation categories were analyzed. Homosexual men were the reference category when evaluating sexual minorities only.

The socio-demographic variables selected were: race/ethnicity, age, marital/cohabitation status, education, and income. Race/ethnicity was recoded into four categories: white, black/African American, Hispanic, and other race/ethnicity. The Hispanic ethnicity consisted of Hispanic sub groups i.e., Puerto Rico, Mexican, Mexican-American, Central or South America. The “other” race/ethnicity category was composed of Native American/Alaska Native, Asian, including Asian Indian, Chinese, Philippine, Korean, Vietnamese, Japanese, and other Asian subgroups. Combining these groups was due to small numbers of respondents. White was set as the reference category. Education was measured as a four level ordinal variable: high school graduate, some college, bachelor’s degree, and master’s/PhD/professional. High school graduate was set as the reference category. Annual income was measured on a three level scale: \$0-\$34,999, \$35,000-\$74,999, \$50,000-\$74,999, and \$75,000 +. Less than \$34,999 was the reference category. Marital status was measured by recoding values into only two

categories, married/partnership and not married or in partnership. Married/partnership was the reference category. Age was recoded into a three level ordinal scale: 18-39, 40-59, 60+. The age group of 18-39 was set as the reference category.

Various univariate, bivariate, and multivariate techniques were utilized for this analysis. Univariate analysis was used to obtain description of demographic variables and the key independent and dependent variables. Bivariate analysis, such as chi-square, tested for associations among the key independent variable and various preventative health test obtainment variables. Logistic regression was used to predict the likelihood of preventative health test utilization by sexual orientation.

CHAPTER VI

Analysis

Univariate Analysis

Table 1 reports the description of demographic variables. The majority of these respondents were heterosexual females (54.5%) and white (70.5%). The majority of respondents stated their annual household income was \leq \$34,999 and approximately one third of the respondents had at least two years of college. The mean age of the respondents was 48.73.

Table 1. Univariate Analysis - Demographic Variables		
Variable	Percent/Mean	N
Total Sample Size		33117
Sexual Orientation		
Heterosexual Male	43.8%	14495
Gay Male	1.0%	320
Lesbian	0.8%	251
Heterosexual Female	54.5%	18051
Race/Ethnicity		
White	70.5%	23356
Black	15.4%	5107
Hispanic	8.8%	2907
Other	5.3%	1747
Age		
Mean/Standard Deviation (SD)	48.73(SD)	33117
18-39	35.8%	11858
40-59	33.8%	11195
60+	30.4%	10064
Marital Status		
Married/Partnered	58.2%	17382
Not Married/Partnered	41.8%	12503
Household Income		
<\$34,999	42.6%	13317
\$35,000-\$74,999	30.9%	9664
\$75,000+	26.5%	8269
Education		
High School Only	21.7%	7200
Some College	32.5%	10763
Bachelor's	20.8%	6872
Master's/PhD/Professional	14.3%	4723
*p<.05; **p<.01; ***p<.001		
N=33,117		
Source: National Health Interview Survey, 2013		

Table 2 contains the distribution of the dependent variables broken down by type. Among the easy to access tests, most respondents reported being screened for blood pressure at 81.7%, followed by cholesterol screening at 63.8%, and blood glucose screening at 46.1%. Among the physician referral tests that were applicable for both sexes, 21.1% of the respondents reported colonoscopy within the last 12 months, followed by colon cancer tests (18.9%), sigmoidoscopy (10.2%), and finally, FOBT (5.7%). Among males, 15% had obtained a PSA test within the last 12 months. Among women, 47.5% had a mammogram, followed by 45.6% obtaining a Pap test within the 12 months. For HIV testing, 37.8% of respondents had obtained this test within their lifetime.

Table 2. Univariate Analysis - Dependent Variables		
Variable	%	N
Easy to Access Tests		
Blood Pressure	81.7%	27051
Cholesterol	63.8%	20936
Blood Glucose	46.1%	15124
Physician Referral Tests		
Colon Cancer Tests	18.9%	4006
Colonoscopy	21.1%	2141
Sigmoidoscopy	10.2%	193
FOBT	5.7%	162
PSA	15%	217
Mammography	45.6%	6850
PAP	47.5%	8645
HIV Tests		
HIV	37.8%	12507
*p<.05; **p<.01; ***p<.001		
N=33,117		
Source: National Health Interview Survey, 2013		

Bivariate Analysis of All Sexual Orientations

Bivariate analyses were conducted to establish baseline relationships between the dependent variables and independent variables. The dependent variable was comprised of 11 preventative health tests and the key independent variable was comprised of four

sexual orientations. Table 3 shows the results of the chi-square analyses conducted for each dependent and independent variables.

Table 3. Chi-Square Analysis - Preventative Tests and All Sexual Orientations					
Preventative Tests	Heterosexual Male	Gay Male	Lesbian	Heterosexual Female	N
Blood Pressure*** $\chi^2 = 647.423$	75.6%	81.3%	83.7%	86.5%	33117
Cholesterol*** $\chi^2 = 300.180$	58.7%	63.0%	59.8%	68.0%	32812
Blood Glucose*** $\chi^2 = 198.669$	41.7%	47.2%	42.2%	49.6%	32821
Colon Cancer*** $\chi^2 = 75.704$	21.4%	26.5%	12.6%	16.9%	21189
Sigmoidoscopy* $\chi^2 = 7.463$	12.1%	13.3%	–	8.6%	1889
HIV*** $\chi^2 = 401.662$	34.7%	82.3%	51.8%	40.8%	32412
*p<.05; **p<.01; ***p<.001					
N=33,117					
Source: National Health Interview Survey, 2013					

Six of the eleven preventative tests were significant at $\alpha=.05$ and within those six preventative tests, all but sigmoidoscopy were significant at $\alpha=.001$. Preventative tests that were significant included blood pressure, cholesterol, and blood glucose testing (easy to access tests), colon cancer testing and sigmoidoscopy (physician referral tests), and HIV tests.

Easy to Access Tests

For easy to access tests, blood pressure testing overall had the highest percent of participation. Heterosexual women had the highest participation percentage at 86.5%, followed by gay males at 83.1%, lesbians at 83.7%, and heterosexual men at 75.6%. The second highest percent of easy to access tests was cholesterol screening. Heterosexual women obtained cholesterol screening at 68%, followed by gay men at

63%, followed by lesbians at 60%, then heterosexual men at 58.7%. Blood glucose testing had the overall lowest percent rate of testing in the easy to access category. Heterosexual women had the highest percentage rate of blood glucose screening at 49.6%, followed by gay men at 47.2%, lesbians at 42.2%, followed by heterosexual men at 41.7%.

Physician Referral Tests

Within physician referral tests, significance was only found in colon cancer screening and sigmoidoscopy analyses. Of these two cancer preventative tests, colon cancer screening was more prevalent. Gay males had the highest percent of colon cancer screening at 26.5%, followed by 21.4% of heterosexual males, heterosexual women at 16.9%, and lastly lesbians at 12.6%. Among the participants who obtained a sigmoidoscopy, homosexuals collectively had the highest percent of participation at 13.3%, although there was no report of lesbians participating, followed by heterosexual men at 12.6%, and heterosexual females at 8.6%.

HIV Tests

Significance was found in HIV testing participation. Gay men had the highest percent of HIV testing at 82.3%, followed by lesbians at 51.8%, followed by 40.8% heterosexual females, with heterosexual males being the lowest percent of participation at 34.7%.

Logistic Regression Analyses of All Sexual Orientations

The first set of logistic regression analyses examined the effects of the sexual orientation on the utilization of preventative tests. Table 4 contains the results of this analysis.

Health Tests	Gay Male			Lesbian			Hetero Female		
	Exp (B)	SE	B	Exp (B)	SE	B	Exp (B)	SE	B
Blood Pressure	1.592**	.151	.465	1.656**	.172	.504	2.078***	.029	.731
Cholesterol	1.181	.117	.166	1.066	.130	.064	1.478***	.023	.391
Blood Glucose	1.239*	.113	.214	1.023	.129	.022	1.378***	.022	.321
Colon Cancer	1.329	.168	.280	.529*	.261	-.637	.752***	.035	-.285
Sigmoidoscopy	1.119	.547	.112	N/A	N/A	N/A	.686*	.154	-.376
HIV	8.654***	.145	2.158	2.004***	.127	.695	1.303***	.023	.265
*p<.05; **p<.01; ***p<.001									
N=33,117									
Source: National Health Interview Survey, 2013									

Easy to Access Tests

For blood pressure testing, heterosexual women were 108% more likely, gay males 59.2% more likely, and lesbians 65.6% more likely to participate when compared to heterosexual men. *This finding does not support Hypothesis One: homosexuals were more likely to participate in testing than heterosexual men.*

Heterosexual females were 47.8% more likely to participate in cholesterol screening than heterosexual men. There was no difference in cholesterol test utilization among gay men and lesbians, compared to straight men. Although homosexuals and straight men showed no differences in test obtainment, homosexuals had lower levels of participation than heterosexual women. *This finding does not support Hypothesis One, no differences between homosexuals and heterosexual men were found.*

Heterosexual women were 37.8% more likely and homosexual men were 23.9% more likely to obtain blood glucose testing when compared to heterosexual men. There were no significant differences between the likelihood of heterosexual men and lesbians

obtaining blood glucose testing. However, gay men had a lower odds of utilization than heterosexual women. *Homosexual men were more likely to participate than heterosexual men in cholesterol screening, whereas no difference was revealed between lesbian and heterosexual male participation in the screening, thus Hypothesis One was not supported.*

Physician Referral Tests

No difference in colon cancer screening between heterosexual males and gay males was found, however, lesbians were 47.1% and heterosexual women 24.8% less likely to obtain colon cancer screening than heterosexual men. *Hypothesis One was supported for lesbians, as they were less likely to participate in colon cancer screening, however Hypothesis One was not supported for gay males, as there were no differences between gay and heterosexual men and colon cancer screening.*

Among the persons who had a sigmoidoscopy in the last year, there were no differences between gay males and straight males. However, heterosexual women were 31.4% less likely less likely to have had a sigmoidoscopy than heterosexual men. *Hypothesis One was not supported, as homosexuals collectively showed no differences in sigmoidoscopy testing when compared to heterosexual men.*

HIV Tests

Gay males were 765% more likely, lesbians 100.4% more likely, and heterosexual females were 30.3% more likely to obtain HIV testing when compared to heterosexual

men in their lifetime. *Hypothesis One was supported as homosexuals superseded heterosexual men in HIV testing over a lifetime.*

Multivariate Logistic Regression of All Sexual Orientations

Multivariate analysis was performed to assess if the bivariate findings remained after controlling for socioeconomic and demographic variables. This was to check if key independent variable effects remained stable. These variables were race/ethnicity, age, marital/partnership, household income, and education. After running multivariate analyses and upon further examination, it was found that age and marital status contributed to suppression effects. More specifically, age and marital status contributed to suppression effects occurring in cholesterol screening, blood glucose, and colon cancer screening. These findings went against the expected results based on socioeconomic status literature, thus were removed from analyses. Tables 5 and 6 provide the results of this analysis.

Easy to Access Tests

The odds of having blood pressure checked was 76.2% higher for gay men, 89.9% higher for lesbians, and 122% higher for heterosexual women, compared to heterosexual men when controlling for sociodemographic variables. With the addition of controls, the odds of blood pressure testing increased for gay men by 17%, lesbians by 24.3%, and heterosexual women by 14.2% in test participation, although these are modest increases in terms of likelihood. Persons who identified as black/African American were 13.1% more likely than whites to participate in testing, whereas those who identified as Hispanic were 44% less likely and other race/ethnicity were 28.2% less likely to

participate than whites. Those between the age of 40-59 were 52.3% more likely and those over 60 years were 311% more likely to participate than those aged 18-39. Those with annual household incomes between \$35,000-\$74,999 were 23.7% more likely and those with annual incomes over \$75,000 were 94.1% more likely to participate than those with incomes under \$35,000. Those with two years or less of college were 38.1 % more likely, as those with a bachelor's degree were 59.3% more likely, and those with more than a four year degree were 76.8% more likely than those with a high school diploma to participate in blood pressure testing. *Hypothesis One was not supported, as homosexuals collectively had higher odds of participating in blood pressure testing than of heterosexual men.*

The odds of obtaining cholesterol screening did not change among gay men (19.1%) and lesbians (10.7%) when compared with heterosexual men with the addition of sociodemographic controls, less age and marital status. Heterosexual women were 52% more likely to participate in screening (a 4.2% increase) when compared with heterosexual men. Persons who identified as black/African American were 25.4% more likely to participate than of whites. Hispanics were 26.4% less likely and other race/ethnicities 21.1% less likely to participate than of whites. Household incomes between \$35,000-\$74,999 were 31.1% more likely and those with incomes over \$75,000 were 75.9% more likely to obtain testing than households making less than \$35,000 per year. Those with two years of college were 9.4% less likely to obtain cholesterol testing and those with a master's/PhD were 25.4% more likely to participate than persons with a high school diploma. *Hypothesis One was not supported, as gay men and lesbians showed no significant differences in cholesterol screening than heterosexual men.*

For blood glucose testing with the addition of sociodemographic controls, less age and marital status, homosexual men (26.6%) continued to show marginal significance ($p=.047$) in higher levels of participation compared to heterosexual men. The odds of lesbians obtaining blood glucose did not significantly differ when compared with heterosexual men, whereas heterosexual women had increased odds of participation by 40% compared to heterosexual men. Persons who identified as black/African American were 10% more likely to participate in testing, whereas those identifying as Hispanic were 15% less likely to participate than of whites. Household incomes between \$35,000-\$74,999 were 23.7% more likely and those with incomes over \$75,000 were 54.4% more likely than households making less than \$35,000 per year to participate. Those with master's/PhD were 14.3% more likely to obtain testing than persons with a high school diploma. *Hypothesis One was not supported as lesbians showed no significant differences in blood glucose testing than of heterosexual men.*

	Blood Pressure			Cholesterol			Blood Glucose		
	Exp (B)	SE	B	Exp (B)	SE	B	Exp (B)	SE	B
Gay Male	1.762**	.163	.566	1.191	.123	.175	1.266*	.119	.236
Lesbian	1.899**	.185	.641	1.107	.137	.102	1.066	.135	.063
H. Female	2.220***	.035	.798	1.520***	.026	.419	1.400***	.025	.337
Black/AA	1.131*	.049	.123	1.254***	.037	.226	1.099***	.035	.095
Hispanic	.560**	.054	-.580	.736***	.047	-.307	.850***	.047	-.162
Other	.718***	.070	-.331	.789***	.055	-.237	.967	.054	-.034
40-59	1.523***	.036	.421						
60+	4.106***	.056	1.412						
Not Married	.955	.037	-.046						
\$35K-74,999	1.237***	.40	.213	1.311***	.030	.271	1.237***	.030	.213
\$75,000+	1.941***	.051	.663	1.759***	.035	.553	1.544***	.034	.435
College 2yr<	1.381***	.042	.323	.906**	.033	-.098	.947	.032	-.055
Bachelor's	1.593***	.051	.466	1.022	.039	.022	.956	.037	-.045
Master's+	1.768***	.064	.570	1.254***	.046	.227	1.143**	.043	.133
* $p \leq .05$ ** $p \leq .01$ *** $p < .001$									
N=33,117									
Source: National Health Interview Survey, 2013									

Physician Referral Tests

For colon cancer screening participation, homosexual men (42.1%) continued to show marginal significance ($p=.044$) in higher levels of participation compared to heterosexual men. Lesbians were 49.5% less likely and heterosexual females 23.2% less likely to participate than heterosexual males with the addition of sociodemographic controls. Persons who identified as black/African American were 44.5% more likely to participate than of whites. Those with a master's/PhD were 20.5% more likely to obtain testing than persons with a high school diploma. *Hypothesis One was not supported for gay men, as they were marginally more likely to participate in colon cancer screening than heterosexual men. Hypothesis One was supported for lesbians, as they were less likely to obtain colon cancer screening when compared to heterosexual men.*

Gay males and lesbians lost significance with the addition of controls for sigmoidoscopy. Heterosexual women were 39.4% less likely to participate than heterosexual men. There were no reports of lesbians participating in sigmoidoscopy testing. Persons who identified as black/African American were 167% more likely as those who identified as Hispanic were 188.3% more likely to participate than whites. Those between the ages of 40-59 were 136% more likely to participate than those aged 18-39. *Hypothesis One was not supported, collectively, gay males showed no differences in sigmoidoscopy testing when compared with heterosexual men.*

HIV Tests

Within a lifetime, the odds of gay men having a HIV test was 755% more likely than heterosexual men, however, their odds decreased by 10.6% with the addition of covariates. Lesbians were 76.7% more likely than heterosexual men to have been tested

for HIV, however this was a 23.7% decrease with the addition of sociodemographics. Heterosexual women were 47.7% more likely to have obtained HIV testing than heterosexual males, which was an increase by 17.4%. Persons who identified as black/African American were 166.4% more likely and those identifying as Hispanic were 12.2% more likely than whites to participate. Those aged over 40 were 20.5% less likely and those aged 60+ were 71% less likely to obtain testing than those between 18-39 years. Those whose household income was \$35,000-\$74,999 were 11.5% less likely to participate than those with household incomes under \$35,000. Those with a master's/Ph.D were most likely to obtain HIV testing (44.7%) followed by those with some college (28.8%) or a Bachelor's degree (26.9%) than those with a high school diploma. *Hypothesis One was supported with these findings, collectively, homosexuals superseded HIV testing utilization when compared to heterosexual men.*

Table 6. Logistic Regression, Physician Referral and HIV Tests – All Sexual Orientations With Control Variables									
	Colon Cancer Tests			Sigmoidoscopy			HIV		
	Exp (B)	SE	B	Exp (B)	SE	B	Exp (B)	SE	B
Gay Male	1.421*	.175	.351	1.003	.574	.003	8.546***	.157	2.145
Lesbian	.505*	.277	-.683	-	-	-	1.767***	.139	.569
H. Female	.768***	.040	-.264	.606**	.201	-.502	1.477***	.027	.390
Black/AA	1.445***	.053	.368	2.669***	.247	.982	2.664***	.038	.980
Hispanic	.908	.087	-.097	2.883**	.371	1.059	1.122**	.049	.115
Other	-	-	-	1.701	.500	.531	.948	.059	-.053
40-59				2.375***	.198	.865	.795***	.030	-.229
60+							.290***	.039	-1.237
Not Married				1.073	.221	.071	1.013	.029	.013
\$35K-74,999	1.032	.049	.032	1.239	.249	.214	.885***	.034	-.122
\$75,000+	1.111	.054	.105	.735	.292	-.308	.938	.039	-.064
College 2yr<	1.056	.051	.055	1.055	.275	.053	1.288***	.036	.253
Bachelor's	1.017	.061	.017	.834	.322	-.182	1.269***	.042	.238
Master's+	1.205**	.066	.186	.965	.326	-.036	1.447***	.048	.370
*p ≤ .05 ** p ≤ .01 *** p < .001									
N=33,117									
Source: National Health Interview Survey, 2013									

Bivariate Analysis of Sexual Minorities

Bivariate analyses were performed using the sexual minority subsample to establish baseline relationships between the dependent variables and independent variables. Only two of the eleven preventative tests showed significance. The results are found in Table 7.

Table 7. Chi Square Analysis – Preventative Tests and Sexual Minorities Only			
Preventative Test	Gay Male	Lesbian	N
Colon Cancer*** $\chi^2 = 75.704$	26.5%	12.6%	320
HIV*** $\chi^2 = 401.662$	81.6%	50.6%	571
*p<.05; **p<.01; ***p<.001			
N=33,117			
Source: National Health Interview Survey, 2013			

The participation of gay males and lesbians in colon cancer screening and HIV testing was significant. For colon cancer screening, utilization levels for gay men and lesbians were 26.5% and 12.6% respectively. For HIV testing, 81.6% of gay males obtained this test as 50.6% lesbians did. *Hypothesis Two, was supported, gay men superseded lesbians in test utilization for two of the eleven tests.*

Logistic Regression Analyses of Sexual Minorities

The first set of logistic regression analyses examined the association of sexual minority status on the utilization of preventative tests. Significance was maintained for colon cancer screening and HIV testing. Table 8 contains the results of this analysis.

Table 8. Logistic Regression – Sexual Minorities			
Health Tests	Lesbian		
	Exp (B)	SE	B
Colon Cancer Screening	.399*	.308	-.918
HIV	.232***	.192	-1.463
*p<.05; **p<.01; ***p<.001			
N=33,117			
Source: National Health Interview Survey, 2013			

Physician Referral Tests

The odds of lesbians participating in colon cancer screening were 60.1% less likely compared with gay men. *Hypothesis Two was supported, lesbians were less likely to participate in colon cancer screening.*

HIV Tests

The odds of lesbians participating in HIV testing was 76.8% less likely compared with gay men. *Hypothesis Two was supported, lesbians were less likely to participate in HIV testing compared to homosexual men.*

Multivariate Logistic Regression of Sexual Minorities

Multivariate analysis was performed to assess if the bivariate findings remained after controlling for socioeconomic and demographic variables among sexual minorities only. These variables were race/ethnicity, age, marital/partnership, household income, and education. Table 9 provides the results of this analysis.

Physician Referral Tests

With the addition of sociodemographic controls in this regression, the odds of lesbians participating in colon cancer testing were 71.3% less likely than gay males. However, this was an 11.2% increase in odds with the addition of sociodemographics.

Interestingly, none of the covariates significantly influenced test participation.

Hypothesis Two was supported, lesbians were less likely to participate in colon cancer screening than gay men.

HIV Testing

The odds of lesbians obtaining HIV testing within a lifetime were 76.3% less (a 0.5% change) likely when compared to gay men. Persons with bachelor's degree were 115.2% more likely and those with a master's/PhD were 139% more likely to participate in HIV testing than those with a high school diploma. *Hypothesis Two was supported, lesbians were less likely to obtain HIV testing than gay males.*

	Colon Cancer Tests			HIV		
	Exp (B)	SE	B	Exp (B)	SE	B
Lesbian	.287***	.354	-1.247	.237***	.209	-1.440
Black/AA	.287	.354	.083	1.315	.306	.274
Hispanic	.437	.795	-.828	1.251	.381	.224
40-59	.753	.344	-.283	1.274	.229	.242
60+	N/A	N/A	N/A	.629	.309	-.464
Not Married	.813	.341	-.207	1.213	.240	.193
\$35K-74,999	.642	.407	-.443	.973	.258	-.027
\$75,000+	.808	.438	-.214	1.153	.321	.143
Some College	1.342	.489	.294	1.694	.294	.527
Bachelor's	.866	.535	-.143	2.152*	.335	.766
Master's+	1.755	.541	.563	2.388*	.375	.870
*p ≤ .05 ** p ≤ .01 *** p < .001						
N=33,117						
Source: National Health Interview Survey, 2013						

CHAPTER VII

Discussion and Conclusion

All Sexual Orientations

Health scientists believe there are many factors that influence health and longevity. Efforts to prevent disease, such as annual medical checkups, include one or more of the preventative tests examined in this research (Mahalik, Burns and Syzdek 2007). Some of the tests are either age dependent (typically) or sex dependent. Overall trends in preventative test utilization among certain groups may help to explain differences in morbidity.

This study provides some insight on population-based preventative test utilization among sexual minorities. What this research also aimed to do was provide a baseline of preventative testing utilization among sexual minorities. Although the sample size of sexual minorities was considerably less than heterosexuals, the findings were overall congruent with the available literature on preventative health test utilization, even though the amount of literature on sexual minorities is low. Population-based evaluation of preventative health screening tests among sexual minorities can be used in conjunction with health disparity findings to emphasize and gain knowledge of areas where more assistance is needed to improve health and campaigns that target at risk populations. Merging the results of preventative test utilization and morbidity rates will allow for a more tailored plan to reduce disparities based on these results. As society's institutions change social norms, for example, the 2015 legalization of same-sex marriage in the United States, social and cultural norms begin to change. Thus, structural stigma and prejudices also may shift towards more acceptance of

homosexuality. This may eventually increase the likelihood of improved health and preventative behaviors among sexual minorities due to decreased medical stigmatization. Monitoring the changes in preventative test utilization, amidst social change, will provide important insight about persisting disparities.

Sexual minorities are collectively considered to be a “priority population” in discussions of healthcare and health disparities (Lim et al. 2014). The health needs within the LGBTQ community have received significant attention from policymakers, legislatures, educators, healthcare providers, and community leaders during the last several years (Lim et al. 2014). Continuing to collect sexual orientation data as a routine demographic variable in government affiliated population-based health surveys, allows quantification of accurate incidence, prevalence, morbidity, and mortality information.

Three categories regarding preventative testing will be discussed in the following order: easy to access, physician referral, and HIV preventative tests. First, chi-square findings will be discussed for all sexual orientations. Second, regression analyses for all sexual orientations will be discussed. Third, results from the homosexual subsample analyses will be discussed. Finally, further implications for study and public health will be discussed.

The chi-square tests with significant results for easy to access tests were blood pressure, cholesterol, and blood glucose. Among physician referral tests, colon cancer screening and sigmoidoscopy were significant. HIV testing was also significant.

Among easy to access tests, blood pressure, cholesterol, and blood glucose screening were significant. Females had the highest percent of participation in these three tests. Heterosexual women had the highest percents of participation in all of the

easy to access tests. Statistically, men make less use of healthcare services than women (Farrimond 2012) which offers some explanation of the higher percents of female participation. Another may be related to longstanding medicalization (i.e. motherhood, mental illness, cosmetic reconstruction) of the female body (Vandenberg-Daves 2014).

The relationship among blood pressure, cholesterol, and blood glucose, relative to cardiovascular disease, emphasizes the importance of preventative testing. Among lesbians, a population-based study found that lesbians had twice the odds of being overweight and obese than heterosexual women (Boehmer et al. 2007), which may increase the likelihood of abnormal blood pressure, cholesterol, and blood glucose. Research also shows that lesbians are less likely to consider themselves as overweight (Cochran et al. 2001), thus, hypertension, hyperlipidemia, and high blood may not be detected as early, and the rate of preventative testing may be less than of heterosexual women.

Although the men in this study had lower percents of participation, homosexual men had higher percents of all easy to access tests than heterosexual men. Of concern however, eating disorders are consistently found among gay men as opposed to heterosexual men (Bosley 2011), which may negatively affect blood pressure, cholesterol levels, and blood glucose. Consequently, a decline in cardiovascular health leading to cardiovascular disease may result. Overall, males with eating disorders are less likely to seek help for this disease, partially due to the stigmatization related with eating disorders (Bosley 2011) and sexual orientation stigmatization. As such, abnormal blood pressure, cholesterol, and blood glucose may go undetected for a longer period of time, thus increasing the likelihood of cardiovascular disease among homosexual men.

Although homosexuals had significantly higher rates of testing than heterosexual men, the continuation of preventative testing behaviors, especially among sexual minorities is desired.

Among physician referral tests, sigmoidoscopy, and colon cancer screening were significant. Males had the highest percent of participation in these tests. Colon cancer screening was higher among heterosexual males, as sigmoidoscopy was for homosexual men. One explanation for increased rates of CRC testing among men may be situational. They may be advised to be screened during an appointment while seeking other health concerns, especially prostatic or HIV concerns (Brown and Tracy 2008). The low rates of colorectal cancer screening among women may be related to the perception of being at a lower risk. Overall, a variety of sex-specific behaviors, perceptions, and barriers may likely determine if a colorectal type screening is completed. Due to the lack of empirical studies on colorectal screening among sexual minorities, this research contributes by providing information on the prevalence of screening and differences among the heterosexual and homosexual population.

Among HIV tests, homosexual respondents had the highest level of test participation. Gay men had the most participation of all sexual orientation categories. The AIDS crisis in the 1980s led to exceptional rates of HIV testing among gay men (Valdiserri 2011). However, some literature has cautioned that HIV/AIDS has become more normalized and perception of risk has decreased (Flowers et al. 2013), resulting in decreased testing. Of the gay men in this research, 82.3% obtained testing, as 51.8% of lesbians did. Although lesbian participation was approximately half of gay men, the research on lesbians and HIV indicates moderate participation (Fredrick-Goldstein et al.

2013). Likewise, there has been some concern that some lesbians perceive the risk of infection as low due to their same sex behavior (Taylor 1999).

This study found that sexual orientation was associated with the utilization of *some* preventative tests. However, these findings did not generally support an association between lack of healthcare obtainment and preventative behaviors due to various issues such as stigmatization and discrimination, reflected in the available literature.

As stated before, it is unfortunately challenging to find detailed information on differences in specific preventative test utilization; hence, some of the explanations for the findings are broad. In general, heterosexual women have a higher utilization of healthcare services and preventive services in particular, compared to men (Chacko, Macaron and Burke 2015). On the contrary, current research shows poor health *behaviors* among heterosexual men. Jeffries and Grogan (2012) research on male self-referral to primary healthcare services found that men delayed seeking help due to their constructed self-reliance. They were expected to solve their own problems, because they were strong and in control (Jeffries and Grogan 2012). Similarly, a 2010 study showed that the male participants who believed that “real men” should keep concerns and emotions private, went for fewer routine health examinations (Hammond, Matthews, and Corbie-Smith 2010). However, sexual orientation information was not provided in both of these studies.

Blood pressure, cholesterol, and glucose testing, which is part of regular cardiovascular screening, is important because it detects risk factors at an early stage. As such, participation had similar levels of use as heterosexual men and heterosexual

women. Within the easy to access tests, after controlling for sociodemographics, the odds of obtaining blood pressure testing was significantly higher for heterosexual females, followed by lesbians, and then gay males, when compared to heterosexual men. Hypothesis one was not supported for this reason. In general, higher prevalence of blood pressure screening, as opposed to cholesterol and blood glucose screening, may reflect its institutionalization as a clinical standard of practice and its availability outside of medical settings, as it does not require any laboratory costs (Oswalt and Wyatt 2013). This may provide some explanation why heterosexual women, gay men and lesbians had higher odds of testing than did heterosexual men. With heterosexual men as the reference category, one possible explanation of many of the findings may be related to heterosexual male health behaviors. Rates of prevention screening behaviors among men are less available, although some research has shown that sexual orientation is related (Oswalt and Wyatt 2013). For example, although the HPV vaccination was not a variable in this study, a 2011 study found that gay and bisexual men were more interested in receiving the HPV vaccine than their heterosexual counterparts (Gilbert et al. 2011), though no studies have examined actual rate differences based on sexual orientation. One explanation of the higher odds of both heterosexual women and lesbians participating in blood pressure testing is that during gestation, blood pressure is checked often, as hypertension is associated with adverse pregnancy outcomes (Robbins et al. 2011; American College of Obstetricians and Gynecologists 2011).

For cholesterol screening, hypothesis one was not supported. Homosexual men and lesbians showed no significant differences in screening participation compared to that of heterosexual men. It is possible that other factors such as socioeconomic status,

healthcare access, and language barriers may contribute to low screening rates, especially among minorities (Kenik, Jean-Jacques and Feinglass 2014). Although those who identified as black/African American were more likely to participate in cholesterol screening, Hispanics and other race/ethnicities were less likely to participate in this test, which is supported in some literature. It is well established that dyslipidemia is a common hallmark of HIV infection and antiretroviral therapy (Klein, Hurley and Sidney 2003). The failure of those who are HIV positive and seldom have their cholesterol checked may result in comorbidity.

Hypothesis one was not supported for blood glucose testing. Homosexual men were marginally significant with increased levels of test participation, whereas lesbians showed no significant differences in blood glucose test participation than of heterosexual men. Heterosexual women however were 40% more likely to participate in testing. Blood glucose testing is performed daily, often multiple times, depending on they type of diabetes (Engelke 2015). Although the amount of people with diabetes was not evaluated in this study, this finding may be related to lack of diagnosis due to decreased preventative care participation among sexual minorities and heterosexual men. A 2015 population-based study from Sweden found that sexual minorities were more likely to report conditions such as high blood pressure and diabetes (Bränström, Hatzenbuehler and Pachankis 2015). Thus, the emphasis on promoting preventative care procedures is needed within the LGBTQ community and heterosexual men.

For physician referral tests after controlling for sociodemographics, homosexual men had increased odds of colon cancer screening when compared with heterosexual men. This meant that hypothesis one not supported for homosexual men. Lesbians had

decreased odds (49.5%) of CRC testing when compared to heterosexual men, thus hypothesis one *was* supported for lesbians. Colonoscopy testing among women and in particular sexual minority women has typically shown lower participation rates. For lesbians, one of the primary reasons contributing to decreased cancer prevention test utilization is the fear of discrimination or exposing sexual orientation with their healthcare provider (Brown and Tracy 2008). However, studies with similar results as this research has shown that rates of participation in colonoscopy and sigmoidoscopy did not differ by sexual orientation (Austin et al. 2012). Borkhoff et al. (2013) found that screening rates for colorectal cancers for women were significantly lower than of men in their cohort of 7,652,592 people (Borkhoff et al. 2013). Some have suggested that low numbers in colorectal cancer screening may reflect the nature of the disease and the test itself. Healthcare providers may recommend screening tests for diseases perceived as less frightening and do not require a lot of explanation and intervention (Borkhoff et al. 2013), however, this could apply to any sexual orientation. Conversely, Heslin et al. (2008) found that gay/bisexual men had greater odds of ever receiving colorectal tests after demographic adjustments compared to heterosexual men (Heslin et al. 2008). Heterosexual men in qualitative studies have expressed concerns regarding the sexual connotation and threat to masculinity that endoscopic CRC screening imposes (Bass et al. 2011). Winterich et al. (2009) suggested that, the unwillingness for some men to complete [CRC] endoscopic screening may be related to masculinity norms: avoidance of femininity, heterosexual presentation, risk-taking, and self-reliance, but these relationships have not been quantitatively examined (Winterich et al. 2009).

For sigmoidoscopy screening, there was no difference in odds of participation among heterosexual and homosexual men, thus rejecting hypothesis one. Interestingly, heterosexual women had decreased odds of screening when compared to heterosexual men. While the overall rates of CRC screening are increasing in women, they slightly lag behind reported rates in men (American Cancer Society 2015a). Some suggestions for these findings may include risk factors, such as distribution of adiposity, hormonal status, and the differential effect of race/ethnicity on males and females. Also, issues surrounding screening, such as barriers, compliance, and efficacy, differ significantly by gender and within racial subsets of women (Chacko et al. 2015).

Collectively, homosexual men and women superseded heterosexual males in HIV test participation, thus hypothesis one was supported. However, current statistics from the CDC show that heterosexual sex is the second most common route of transmission of HIV in the United States. Heterosexual sex is the primary route of transmission of HIV for women; approximately four out of every five new HIV infections among women diagnosed in 2010 were attributed to heterosexual contact (CDC 2013). Lower rates of HIV screening among heterosexual men comes with various consequences. The internet has become an important tool in broadening the availability for, in this case, heterosexual men, to explore sexual encounters with other men, regardless of their intention of exploring their sexuality or attempting to reinforce their masculinity (Reynolds 2015). There is likely an increase in the transmission of STI's including HIV, due to concealed behavior and increased accessibility through online sites such as "Craigslis" (Renyolds 2015) or other anonymous "meet up sites." A self-identified heterosexual male unaware of his HIV statue may infect his partners or others with HIV.

This is particularly dangerous as what is “masculine” and what is required of “manhood” in American culture. The perception of being infected or transmitting HIV may potentially have negative effects on prevention and intervention efforts.

Sociodemographic variables such as income, insurance status and the affordability of care enable a person with healthcare needs to seek services. Research suggests that this is especially true for those seeking preventative care services, such as low socioeconomic status adults, who are less likely to have physical examinations, immunizations and other basic forms of preventative care (Maciosek et al. 2010, Prus 2007; Wright and Perry 2010).

Race/ethnicity was significantly associated with blood pressure, cholesterol, blood glucose, colorectal, sigmoidoscopy, and HIV test participation. Persons who identified as black/African American were more likely to participate in *all* of the significant preventative tests. Research suggests that African Americans are less likely to utilize preventative care services than Americans of European descent and these patterns may contribute to racial health disparities in the United States (Pullen, Perry and Oser 2014). Overall, African Americans tend to use health services less than their white counterparts (Chopel et al. 2015). This often results in later diagnosis of health problems when they are more serious thus contributing to worse outcomes in this group (Wright and Perry 2010; Zuvekas and Fleishman 2008). Racial attitudes, experience, social support, and religiosity also contribute to the decision to utilize healthcare, to include preventative screening among African Americans (Pullen et al. 2014). One explanation for the increased odds of HIV testing among African Americans, the racial/ethnic group most affected by HIV, may be due to increasing HIV campaigns.

Various campaigns have been created to address these issues. Campaigns such as *Take Charge. Take the Test*, encourage African American women to get tested for HIV. *Testing Makes Us Stronger*, aims to increase HIV testing among black gay, bisexual, and other men who have sex with men. *Let's Stop HIV Together*, focuses on stigma and raises awareness. The human immunodeficiency virus prevention projects for community-based organizations have provided effective HIV prevention services over five years to gay, bisexual, and transgender youth of color and their partners (CDC 2015a). Hispanics had increased odds of being screened for HIV in their lifetime than whites. Greater numbers of people are living with HIV in Hispanic communities than among some other races/ethnicities. Hispanics tend to have sex with partners of the same race/ethnicity, increasing the risk of HIV infection. Cultural factors may increase the risk of HIV infection. Some Hispanics might not seek testing, counseling, or treatment if infected because of stigma or fear of discrimination. Traditional gender roles, cultural norms (“machismo,” which stresses virility for Hispanic men, and “marianismo,” which demands purity from Latinas), and the stigma around homosexuality may add to prevention challenges (CDC 2015b). This increased likelihood of HIV screening among Hispanics may be attributed to the campaigns including *We Can Stop HIV One Conversation at a Time (Podemos Detener el VIH Una Conversación a la Vez)*, which encourages Hispanics to talk openly about HIV and new community partnerships to raise awareness about testing, prevention, and retention in care among populations disproportionately affected by HIV (CDC 2015b).

Age was also significantly associated with preventative test utilization. Those aged 40-60+ had increased odds of participating in blood pressure testing,

sigmoidoscopy, and decreased odds of HIV testing. One suggestion for increased odds in blood pressure testing is the likelihood of morbidity and comorbidity of metabolic risk factors (hypertension, glucose tolerance, dyslipidemia, and central obesity) (Wai Sze Lo, Sek Ying and Fung Kam 2015) among aging individuals and chronic health conditions that warrant increased health provider appointments. In opposition, Moderi et al. (2013) study found that less than half of their sample respondents aged 50-80, obtained a colonoscopy and men were most likely to participate (Moderi et al. 2013). Decreased odds of HIV testing for those 40-60+, when compared with ages 18-39, may suggest that HIV/AIDS education in public schools has shown some success by increasing awareness. Findings from Ma, Fisher and Kuller's (2014) research indicate that 87% of the high school respondents (N=16,109) reported having HIV/AIDS education. Of these students, they were one and one half times more likely to be tested from HIV than those without HIV/Aids education (Ma, Fisher and Kuller 2014).

Marital status was *only* associated with blood pressure screening, as those not married had a decreased likelihood of screening compared to those who were married. There has been a decrease in those married, an increase in cohabitation, a rise in divorce and earlier divorces, and a decline in remarriage rates (Lesthaeghe 2014). Prior to the legalization of same-sex marriage, studies that have compared gay, lesbian, and heterosexual couples have found no significant differences in love, satisfaction, or the partners' evaluations of the strengths and weaknesses of their relationships (Peplau 1991; Savin-Williams and Esterberg 2000). Thus, the findings in this study may also reflect that marriage and cohabitation have similar meanings for same-sex and different-sex partners and therefore have similar effects on health.

Annual household income was also significantly associated with preventative screening utilization. Those with annual household incomes \$35,000 to \$75,000+ had higher odds of participating in all easy to access tests compared to those with an annual income less than \$35,000. This may be related to those who have higher incomes typically have more healthcare advantages such as accessibility and health insurance coverage. In general, people with a low socioeconomic status are at an increased risk for negative health outcomes (Marmot 2005). Income may influence health behaviors through the ability to purchase healthy food, live in better housing and obtain medical care (Galobardes et al. 2006).

Level of education was also influential among preventative test behaviors. Those with some college, a bachelor's degree, or a master's/PhD, compared with those only having a high school diploma, were more likely to participate in blood pressure and HIV testing. Those with a master's/PhD were more likely to participate in blood glucose and CRC screening than those with a high school diploma. Education may influence health through health-related knowledge, literacy, skills, occupational opportunities, and thereby income (Galobardes, Lynch and Smith 2007).

Sexual Minorities

In the sexual minority subsample, colon cancer screening and HIV testing were significantly related to sexual minority status, thus supporting hypothesis two. Lesbians were less likely to participate in CRC screening and HIV testing than of gay men. Both of these findings coincide with the aforementioned literature on preventative test participation. In addition, although both gay men and lesbians had higher levels of HIV screening rates of the respondents in this study, lesbians were less likely to have HIV

screening within their lifetime than of gay men. This is congruent with the available literature of HIV screening participation. Education was the only sociodemographic variable significantly associated with HIV testing. Those with a bachelor's or master's/PhD level of education were more likely to be screened than those with only some college or a high school diploma.

Studies consistently show that men in general are more likely to engage in risky behaviors that may contribute to morbidity and mortality (Dean et al. 2000). Socialization may encourage men to downplay the importance of health, thus putting their health at risk. Much health research has indicated that men often subscribe to hegemonic masculine ideals, such as toughness, robustness, and stoicism, and thus avoid healthcare services to demonstrate and confirm their masculinity (Cameron and Bernades 1998; O'Brian, Hunt and Hart 2005). Conversely, similar gendered behavior patterns are not typically observed within the homosexual population, as many individuals diverge from socially assigned gender roles (Sanford 2005), which is reflected in some the findings in this research.

Although the research of some cancer preventative test screenings is sparse, the combination of being a sexual minority and underutilization of cancer screening among socially marginalized groups (Brown and Tracy 2008) is cause for great concern. Screening availability is problematic in many places, especially in areas of low SES. Some health centers have implemented multi-component initiatives to increase colorectal screening, hoping to provide easier accessibility for testing, especially for persons with low income or no health insurance. For example, within a large metropolitan city, although family health centers may not have endoscopic abilities on-

site, they do provide other testing at low cost. If necessary, qualifying patients at these clinics, with questionable or positive results, have been able to obtain a no-cost colonoscopy at a local hospital (Liss et al. 2013). Anal cancer is much higher among HIV positive men and men who are infected with HPV, as more than 70% of all anal tumors contained HPV virus. Unfortunately, this thesis was unable to examine anal cancer specifically. In Reed et al.'s 2010 study, they found that a major barrier in anal cancer testing was cost, not lack of willingness to be tested (Reed et al. 2010). This asserts that there are connections among various types of tests in which participation heavily relies on accessibility and cost. For some of the preventative screening tests, there was significant support that sexual orientation does affect testing participation.

Limitations

Creating a sexual minority variable that conformed to binary norms, excluded respondents who did not identify as such. Data on sexual minorities such as transgender, Two-Spirit, pan-sexual, and so forth were not evaluated, as this valuable information was absent. The justification for this, although not ideal, was due to the considerably low numbers of sexual minorities within this sample. In hindsight, if the addition of a third category 'other' was included, it would have created a better and more accurate landscape of sexual minority preventative behaviors.

This research evaluated preventative test utilization within a 12 month time frame, with the exception of HIV testing. Higher levels of participation, or lack thereof, in preventative test utilization, such as HIV test participation, may have resulted in different findings if the question expanded beyond a year. The recommended screening for cancer related tests often has two, three, or five year spans between testing. Hence, a

person may have obtained testing within the recommended time frame but not within the 12-month time frame of the survey.

One important limitation of this research was the inability to accurately identify the respondents' health insurance status. Health insurance, which is a key predictor of healthcare obtainment, was excluded largely due to data issues. Multiple types of insurance, such as public, i.e., Medicaid or Medicare, private, military, and so forth, were choices in the dataset. However, the question asked, "how many *people in your household* have veterans type of insurance coverage," as opposed to "do *you* have veterans type of insurance coverage?" This inability to accurately identify the respondents' insurance status was compensated by using demographic variables such as education, income, and partnership status as a proxy for the likelihood of health insurance coverage.

The research does not address moderative effects of race and ethnicity on the relationship between preventative screening utilization and sexual orientation. As race/ethnicity was significantly associated with some preventative tests, further exploration of race/ethnicity is warranted, especially among marginalized sexual minorities.

This research used unweighted data, as it was not included in the public use dataset. If available for future research, weighted data may better evaluate the trends in preventative test utilization within the homosexual population. Weighted data possesses considerable advantages in simplicity, in reduced variances, and in robustness.

Conclusion

Documentation of nationally representative demographic patterns among sexual minorities in surveys such as the American Community Survey, National Survey of Family Growth, and NHIS, are in their beginning (Denney and Gorman 2014). Each year that NHIS is conducted now, an increased reporting of self-identified sexual minorities will allow for more accurate and longitudinal evaluation. Demographic and health trends have been restricted by heteronormative framework, which will need expansion as sexual minorities become prevalent in data collection. This will be challenging for demographers as sexual orientation is multifaceted in regards to attraction, behavior, and identity. Sexual minority research also proves complex due to fluidity of sexual orientation and changes over a lifespan (Denny and Gorman 2014).

Public health campaigns aimed at increasing awareness of health risks among sexual minority women may be a pathway for encouraging sexual minority women to utilize preventative health screening. The current sociopolitical climate may facilitate increased healthcare access to sexual minorities. There is great opportunity for healthcare reform policies, such as the Affordable Care Act, to provide healthcare coverage to all U.S. citizens, which would facilitate access to healthcare leading to broadened healthcare test utilization.

For all sexual minorities, public health interventions may require specialized messages to improve various types of preventative health tests. The emphasis needs to lie in the benefits of screening in the discourse of susceptibility to various illnesses that can be prevented with proper screening. Additionally, information on how to overcome barriers, such as health insurance obtainment, or access to homosexual-friendly clinics

needs to be provided. Additionally, once data on sexual minority preventative health is established, the methodology will potentially require adjustments, moving from the heteronormative model towards an accurate representation of sexual minorities and addressing the unique complexities of this demographic group. Future nationally representative population studies on the health behaviors among sexual minorities are necessary to continue improving health of a marginalized group.

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