MACRO LEVEL PREDICTORS OF COMMUNITY HEALTH CENTER HIV TESTING APPROACH

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Using a logistic regression model, this dissertation employed a macro level gateway provider model to explore eight factors that may influence community health center HIV testing approach. The logistic regression model indicated that three variables related to community health center HIV testing approach. First, all else equal, the odds of offering routine HIV testing for community health centers that perceived their patients and community to be at average risk for HIV were 3.676 times the odds for those centers that perceived their patients and community to be at low or no risk for HIV. Further, the odds of offering routine HIV testing for community health centers that perceived their patients and community to be at high risk for HIV were 4.693 times the odds for those centers that perceived the community to be at low or no HIV risk. Second, all else equal, the odds of offering routine HIV testing for community health centers in which an HIV testing policy exists were 2.202 times the odds for those centers in which an HIV testing policy does not exist. Third, all else equal, the odds of offering routine HIV testing for community health centers that received funding specifically for HIV testing were 2.938 times the odds for those centers that did not receive such funding. No other individual predictor variables in the model were related to community health center HIV testing approach.

ACKNOWLEDGEMENTS

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Above all, I thank my parents for providing unwavering support and reassuring cheers my entire life. Thank you for reminding me to do my homework, from the 2nd to the 23rd grade, and for believing I could do this.

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CHAPTER 1

INTRODUCTION

HIV is a virus that spreads through body fluids and affects a person's immune system. Unlike some viruses, a person cannot be cured of HIV. Over time HIV debilitates the body's ability to fight off infections and diseases leading to AIDS (Centers for Disease Control and Prevention [CDC], 2014). Currently, 1.2 million people in the United States are living with HIV infection (CDC, 2012a). This is a small proportion (about 0.4 percent) of the total population of the United States, but HIV disproportionately affects certain racial and ethnic groups. For example, the HIV prevalence rate among Blacks is about 1.7 percent and is 0.6 percent among Hispanics and/or Latinos compared to the prevalence rate among whites which is 0.2 percent (CDC, 2012b).

HIV carries with it a stigma that includes negative attitudes and value based assumptions (UNAIDS, 2013). The stigma may be directed at persons with HIV through prejudice and discrimination; however, the stigma may also be directed more generally at the disease itself (Levy, 2014). Because HIV infection is associated with stigmatized behaviors (such as homosexuality and drug use), has no cure, and is life-threatening, patients and their healthcare providers may avoid discussing HIV and in this way, stigma operates in healthcare visits and negatively affects access to HIV testing and prevention services. For example, research found that Black men who have sex with men were less likely to use HIV prevention services if they were not able to do so in a comfortable, stigma and judgment free healthcare setting (Dillon and Basu, 2014; Saleh, Operario, Smith, Arnold, and Kegeles, 2011; Brooks etzel, Hinojos, Henry, and

Perez, 2005). In an older study of gay and bisexual men that were unaware of their HIV status, nearly two-thirds endorsed HIV stigma as a reason for not seeking testing (Stall, Hoff, Coates, Paul, Phillips, Erkstrand, and Diaz, 1996). This phenomenon of stigma has continued over time. A more recent study found that one quarter of patients seeking HIV care delayed such care for more than a year because they perceived providers have a stigma against people with HIV and do not like caring for persons with HIV (Magnus, Herwehe, Murtaza-Rossini, Reine, Cuffie, Gruber, and Kaiser, 2013).

This stigma and resulting avoidance leads to negative effects on the success of HIV testing. This is evidenced by the CDC estimate that 16 percent of people living with HIV are undiagnosed (CDC, 2013c) and that more than half of new infections in the United States are spread by HIV-positive individuals who do not know they are infected (CDC, 2012c, Hall, Holtgrave, and Maulsby, 2012; Marks, Crepaz, and Janssen, 2006). Populations that have disproportionate HIV prevalence rates also have disproportionate rates of people living with undiagnosed HIV. For example, the rate of Blacks living with undiagnosed HIV is estimated to be 19.4 percent, and among Hispanics and/or Latinos 19.7 percent compared to among whites at 14.8 percent (CDC, 2012b).

HIV testing is key to reducing and stopping the HIV/AIDS epidemic (CDC, 2012c, CDC, 2006a). If a person is tested and receives an HIV positive diagnosis, that person is less likely to transmit the virus for a couple of reasons. First, the majority of people who learn they have HIV substantially reduce risky sexual interactions that may transmit the virus to others (Donnell, Baeten, and Kiarie, 2010; Marks, Crepaz, Senterfitt, and Janssen, 2005). Second, people who learn they have HIV can start antiretroviral treatment that reduces the viral load in their bodies and reduces their risk of transmitting

HIV to others (Cohen, Chen, and McCauley, 2011; Granich, Gilks, Dye, De Cock, and Williams, 2009; Wawer, Gray, and Sewankambo, 2005; Pilcher, Eron, Galvin, Gay, and Cohen, 2004).

However, research shows that many health care providers—including community health centers—still do not routinely test their patients for HIV (Kaiser Family Foundation, 2011; Arya, Patuwo, Lalani, Bush, Kallen, Street, Viswanath, and Giordano, 2012; Office of Inspector General [OIG], 2013a). Health care providers, including community health centers, may not routinely test their patients for HIV because they face multiple barriers to HIV testing such as provider time constraints, lack of funding, staff, and space, as well as provider, patient, and community discomfort with HIV testing (Johnson, Mimiaga, Reisner, VanDerwarker, and Mayer, 2011; OIG 2013b).

Literature shows why certain individuals and groups seek and/or accept HIV testing. Evidence suggests that some individuals seek HIV tests as part of a routine checkup, blood donation, surgery, or unprotected sex (Moore, 2014). However, the reasons people have HIV tests have changed over time. For example, Inungu, Quist-Adade, Beach, Cook, and Lamerto (2005) found that people who sought an HIV test to find out if they were infected declined by over 20 percent from 1998 to 2002 (from 34 percent to 12 percent). Nevertheless, the number of people who had an HIV test as part of routine medical care increased from 11 percent to 25 percent. Other reasons people sought HIV tests were for health and life insurance, military induction or immigration (Inungu et al. 2005).

However, limited literature examines provider provision of HIV testing and even less literature examines what influences an organization’s HIV testing approach. To fully understand why HIV testing has not occurred as part of standard medical care, the medical and public health community need to understand what influences healthcare provider’s HIV testing approach. Some literature has looked at HIV testing in community health centers. For example, research examined implementation of a rapid HIV testing program in a small sample of six community health centers and found that many more patients were tested under the rapid testing program than under targeted HIV testing. Specifically, over 10,000 patients were tested, a large increase over the 3,000 that were tested in those six community health centers in the year prior (Myers, Modica, Dufour, Bernstein, and McNamara, 2009). Other research examined language barriers when offering routine HIV testing in one predominantly Hispanic and/or Latino community health center. This research found that language was not a barrier to HIV testing in this particular community health center. In fact, in this community health center, Hispanics and/or Latinos were significantly more likely to report that their healthcare provider discussed HIV testing with them than were non-Hispanic and/or Latino individuals (33.3 percent versus 6.9 percent) (Arya, Patuwo,Lalani, Bush, Kallen, Street, Viswanath, and Giordano, 2012). Additionally, research studied personnel perceptions about barriers to HIV testing in community health centers. Personnel in 30 community health centers reported that lack of provider time, funding, staff, and space, as well as community and patient discomfort with the topic of HIV were barriers to routine HIV testing. The personnel also reported that having a designated staff person who promoted routine HIV testing helped facilitate routine HIV testing, as did clinical reminders to offer HIV tests routinely (Johnson, Mimiaga, Reisner, VanDerwarker, and Mayer, 2011).

Despite that community health centers serve millions of patients, many of whom are vulnerable to HIV, to my knowledge, no literature examines macro level influences, such as the community health centers provider's perception of community HIV risk, healthcare system variables, external environment, and community resources on community health center's HIV testing approach.

This dissertation attempted to fill the gap in the literature regarding provision of routine HIV testing, specifically filling the niche that examines macro level predictors of community health center HIV testing approach. This study contributed to the understanding of HIV testing in a way not examined before by asking the research question "What influences community health center HIV testing approach?"

Significance of Study

This study was significant because determining why routine HIV testing does not occur is one small piece of the puzzle that might lead to a solution and halt the HIV epidemic that is intertwined with multiple social issues and problems. HIV has been like no other medical and public health issue of our time. The social issues and problems that are related to HIV span the array of our society and culture and include human rights, immigration, employment and workforce issues, discrimination, stigma, confidentiality and medical ethics, and organized religion and faith (AIDS.gov, 2014). While it was outside the scope of this study to examine each of these social issues and how it relates to HIV, this study contributed to a greater understanding of the HIV epidemic by contributing to the literature regarding HIV testing.

This study was also significant because it examined the HIV testing approach of community health centers that serve populations that are disproportionately diagnosed and affected by HIV. Increased HIV testing in community health centers could curb these HIV health disparities because knowing your HIV status could lead to a reduced spread of the disease through change in behaviors and treatment. In order to halt the HIV epidemic, routine testing is needed. However, community health centers do not routinely test their patients, even the vulnerable populations they serve, for HIV.

These disproportionally affected populations are often thought of as a bridge to the general population creating an epidemic that both influences and is influenced by culture, social images in the media, and social structures. For example, black men who have sex with men accounted for 36 percent of new HIV infections in 2010 (CDC, 2012a). Black men who have sex with men may be “on the down low,” a phenomenon in which Black men may identify as heterosexual, not disclose their sexual orientation, and not identify as gay (Paxton, Williams, Bolden, Guzman, and Harawa, 2013). The down low phenomenom is not specific to black men, but may be more prominent among black men due to stigma, religion, and homophobia in Black communities as well as the nature of Black masculinity (Goparaju and Warren-Jeanpiere, 2012; Valera and Taylor, 2011). It is important to note that for several years, Black men on the down low were thought to be the cause of increased HIV infections among Black women - that is that these men would have high risk sex with other men, but also have sex with their Black female partners without disclosing that they also had sex with men. This served to fuel racism and the social image of the Black man as a predator or aggressor. However, some research found the opposite; black men who have sex with men on the down do not engage in greater sexual risky behavior than men not on the down low (Bond, Wheeler, Millet, LaPollo, Carson, and Liau, 2009).

Another example of a vulnerable population among whom HIV testing is influenced by culture, social images, and structure are older persons. Adults over fifty-five account for nearly 20 percent of people living with HIV and are more likely to be diagnosed later in the course of their disease (CDC, 2013e). Preconceived notions of aging and sexuality in our society may be the cause of these late diagnoses. Healthcare providers may not test older patients for HIV because they do not perceive that older patients are sexually active. For example, research found that only 2 percent of healthcare providers asked their older patients about sexual health (Maes and Louis, 2011). However, many older patients are sexually active and face the same risk factors as persons of other ages (Laumann, Glaser, Neves, and Moreira, 2009). For example, women who are no longer concerned about becoming pregnant may not use a condom when having sexual intercourse, a risky sexual behavior. These findings are important because they underscore the need to test everyone routinely, rather than using stereotypical social perceptions about sexuality, sexual identity, and what is commonly thought of as risky sexual behavior to identify persons who should receive an HIV test.

Finally, this study was significant because it examined what influenced a community health center to routinely test for HIV. To my knowledge macro level influences on community health center HIV testing approach had not previously been examined. This study attempted to show why community health centers did or did not offer HIV testing routinely. Knowing what influenced community health centers to offer HIV tests routinely could provide information that would promote routine HIV testing and help to develop HIV testing policies for community health centers, contributing to a possible decrease in the spread of HIV, especially among vulnerable populations.

CHAPTER 2

LITERATURE REVIEW

This chapter describes and summarizes research regarding HIV, community health centers, and HIV testing. Additionally, the importance of examining providers and the lack of research literature that examines providers at the community health center level were described.   The theoretical framework, the gateway provider model, was used in this research to help understand what influences community health center HIV testing approach. The importance of using the gateway provider model at the macro level was discussed. Finally, a summary of research regarding the factors that the gateway provider model theorizes influence a community health center's HIV testing approach was presented.

HIV

The Centers for Disease Control and Prevention (CDC) estimates that approximately 50,000 people become infected with HIV each year (CDC, 2013c). Because the HIV epidemic is fueled by individuals who are often unaware of their infection status, the CDC first issued recommendations in 2006 that encouraged healthcare providers to routinely test all patients, ages 13 to 64, regardless of individual risk factors (CDC, 2006a). As recently as 2014, the CDC still recommends routine HIV testing. However, research shows that many health care providers—including community health centers—still do not routinely test their patients for HIV (Kaiser Family Foundation, 2011; Arya, Patuwo, Lalani, Bush, Kallen, Street, Viswanath, and Giordano, 2012; Office of Inspector General [OIG], 2013a). Health care providers report multiple barriers to HIV testing such as provider time constraints, lack of funding, staff, and space, as well as provider, patient, and community discomfort with HIV testing and that patients do not believe themselves to be at risk and so decline an HIV test when offered (OIG, 2013a, Johnson et al. 2011).

Steady advances in treatment that suppress the HIV/AIDS viral load have dramatically increased the number of people living with HIV (CDC, 2013a). However, not all groups share these advances equally. Certain vulnerable populations do not illustrate the benefit of HIV/AIDS treatment as greatly as white people living with HIV/AIDS. For example, CDC (2014c) found that Blacks, especially Black males, had lower levels of care and viral suppression. Another study that examined treatment and viral load more broadly found that populations vulnerable to HIV including Blacks, men who have sex with men, Hispanic and/or Latinos, and adults living in poor neighborhoods had higher viral loads than others, illustrating that HIV health disparities run the course from infection to treatment (Laraque, Mavronicolas, Robertson, Gortakowski, and Terzian, 2013).

The CDC estimates that 1.2 million people in the United States are currently living with the disease but that 16 percent of those are undiagnosed (CDC, 2013c). The sheer prevalence of people living with undiagnosed HIV increases the risk for future infections. People who do not know their HIV status may unknowingly transmit the virus (CDC, 2013b, Weinstock, Dale, Linely, and Gwinn, 2002; CDC, 2005; Do, Chen, and McFarland, 2005; MacKellar, Valleroy, and Secura, 2005; Patterson, Leone, and Fiscus, 2007). In fact, more than half of new infections in the United States are spread by HIV-positive individuals who do not know they are infected (Hall et al. 2012; CDC, 2012a, CDC, 2003, Marks, Crepaz, and Janssen, 2006). Early detection of those infected with

HIV not only reduces the chance of passing the disease on to other people, it also increases the possibility that the infected person will seek treatment and live a longer and healthier life. HIV testing and knowledge of HIV status is key to reducing and stopping the HIV/AIDS epidemic (CDC, 2013a; CDC, 2006a).

Efforts to stem the epidemic and prevent the spread of HIV and AIDS have primarily focused on educating those most at risk for the disease and modifying their behavior (CDC, 2011a). There is a substantial body of literature that examines both the risk-taking and health-seeking behaviors of this population (see meta-analyses by Doyle, Degenhardt, and Pedrana, 2013 or Mullen, Ramirez, Strouse, Hedges, and Sogolow, 2002). The focus of these research efforts has been to develop educational approaches and interventions that target individuals who already have the disease or who are at high-risk for exposure to HIV.

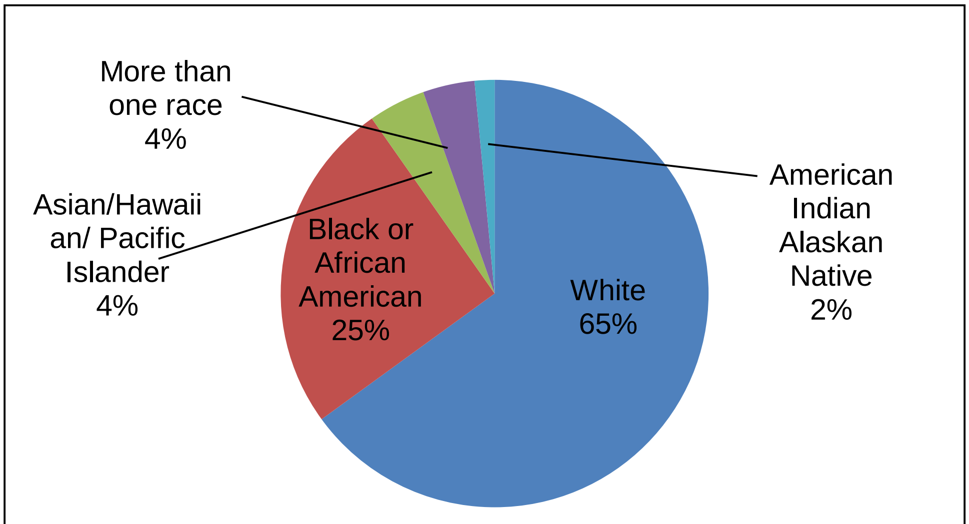
Far less attention has been paid to healthcare provider and HIV testing behavior and the role it plays on curtailing the epidemic of HIV (Parker, Mamam, Pettifor, Chalachala, Edmonds, Golin, Moracco, and Behets, 2013; Phillips, Morrison, Andersen, and Aday, 1998; Doshi, Malebrance, Bowleg, and Sangaramoorthy, 2013). Examination of provider behavior is vital to addressing the rapid spread of the epidemic—especially to groups that are not traditionally considered at risk for HIV such as heterosexuals, or persons in supposedly monogamous relationships. Healthcare providers serve as a gateway to HIV testing. Gateway providers can be either individual healthcare providers, or organizations, such as community health centers. They may offer tests routinely, and if necessary, help patients to access care and services after a patient receives an HIV positive result. Alternatively, they may limit access to HIV testing because they may not perceive there is a need, or they do not know that services are available after an HIV positive result.

Very little research has examined what influences the HIV testing approach of medical organizations such as community health centers. For example, the OIG recently found that only 20 percent of community health centers routinely offered HIV tests (OIG, 2013a). However, the OIG did not determine why such a small percentage of community health centers routinely offer HIV tests to their patients or what makes a community health center more or less likely to take this testing approach. To my knowledge, no research has examined influential factors, such as an organizational policy or funding streams specifically meant to go towards administering HIV tests to patients, on a community health center's HIV testing approach.

Community Health Centers

Community health centers are federally-supported clinics that offer primary care and preventive services to millions of poor, uninsured or underinsured children, adults, and senior citizens (National Association of Community Health Centers [NACHC], 2012). They are located in areas designated by the Health Resources and Services Administration (HRSA) as medically underserved or having a high needs population (NACHC, 2012). These areas may have high rates of poverty or have significantly less access to physicians and/or hospitals. Community health centers are required to offer a core set of primary care services, including HIV testing, but have a great deal of autonomy regarding how they offer these services and what additional services they offer (HRSA, 2011a). HRSA, however, requires that the services offered are tailored to fit the special needs and priorities of the communities in which they are located including providing health services in a linguistically and culturally appropriate setting (NACHC, 2012). Often, community health centers are a source of HIV prevention, care, and treatment for patients in the areas where they are located.

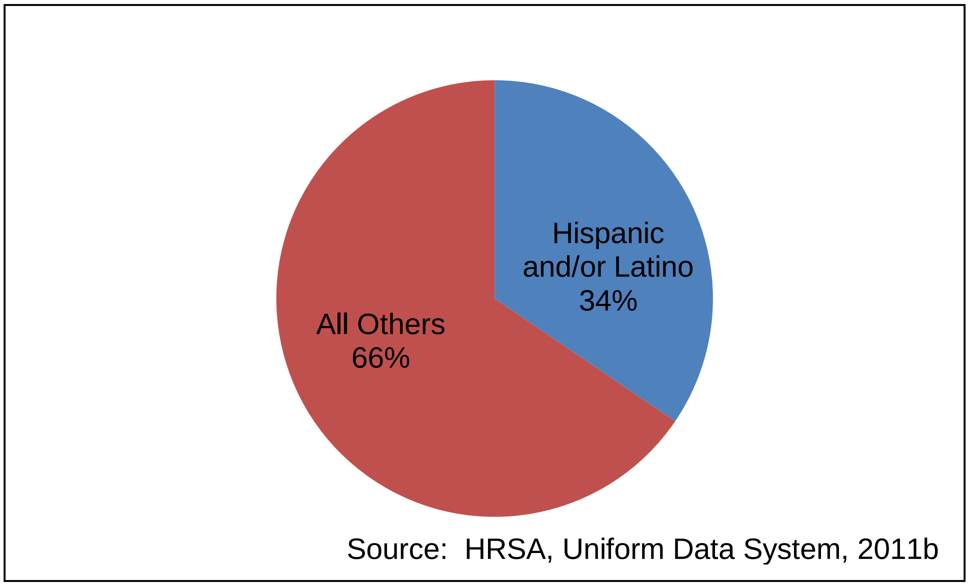
Populations disproportionately affected by HIV, such as Blacks, Hispanics and/or Latinos, and persons living in poverty, are overly represented among community health center patients. For example, as shown in Figure 1, Blacks represent 14 percent of the United States population, but account for 25 percent of community health center patients (NACHC, 2012).



Source: HRSA, Uniform Data System, 2011b

Figure 1. Health center patients by race, 2011.

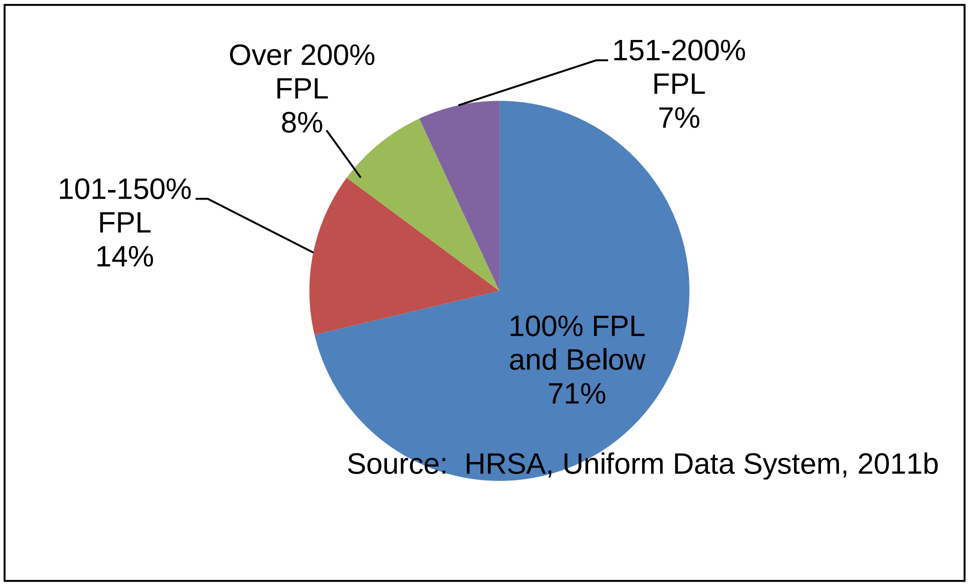
Similarly, as shown in Figure 2, Hispanic and/or Latinos represent 16 percent of the United Stated population, but community health centers estimate that 34 percent of their patients are Hispanics and/or Latinos (NACHC, 2012).



Source: HRSA, Uniform Data System, 2011b

Figure 2. Health center patients by ethnicity, 2011.

Nearly all community health center patients are living in poverty. The federal poverty line for a family of four in 2011 was $22,350 (United States Department of Health and Human Services, 2011) and 71 percent of community health center patients were at that line or below that year (NACHC, 2012; HRSA, 2011b) as shown in Figure 3.



Source: HRSA, Uniform Data System, 2011b

Figure 3. Health center patients by income level, 2011.

HIV Testing in HRSA-funded Community Health Centers

One of the services community health centers are required to offer is HIV testing. HIV testing usually involves collecting and testing a small sample of blood for HIV antibodies, but testing can also be less invasive by swabbing the inner mouth to collect oral fluids. Community health centers may take different approaches to testing their patients for HIV. They may take a targeted approach which specifically directs testing only to patients who engage in high-risk behaviors (e.g., men who have sex with men or intravenous drug users). Alternatively, community health centers may approach HIV testing in a routine manner and test all patients irrespective of their risk status or the reason for their visit to the clinic. These two HIV testing approaches, targeted and routine, stem from different perspectives.

Targeted Testing

Targeted testing is a strategy for HIV testing through which providers identify individuals as high risk for HIV and target them to receive an HIV test. In the past, individuals identified as high risk for HIV included men who have sex with men, intravenous drug users, and persons who shows signs or symptoms of HIV or AIDS. This type of testing is discretionary and dependent on the judgment, training, and perspective of the healthcare provider. Advocates for targeted testing promote it because it costs less and utilizes fewer resources (e.g., time, lab expenses). Using a targeted approach, however, may ultimately result in much greater cost because research indicates that only patients with advanced HIV tend to be tested (Lyons, Lindsell, Ruffner, Wayne, Hart, Sperling, Trott, and Fichtenbaum, 2013; Sullivan and Fiellin, 2010). Targeted testing was the standard for HIV testing in the 1980s and was still recommended by the United States Preventative Services Task Force, an independent panel of experts in prevention and evidence-based medicine, in 2010 when data were collected for this study (United States Preventative Services Task Force, 2013a).

Routine Testing

A routine HIV testing approach, first recommended by the CDC in 2006 and still currently recommended, encourages healthcare providers to regularly test all patients, aged 13 to 64, regardless of their individual risk factors (CDC, 2006a). This means, for example, that a patient who presents with a blood pressure problem or the flu would also be tested for HIV. Consent for the HIV test is obtained through a general consent for medical care form rather than a separate HIV testing consent form. With this approach, the provider typically tells a patient that he/she will be tested for HIV unless the patient objects. This method reaches patients who might not otherwise be tested for HIV because they do not perceive that they are at risk.

Because routine testing does not rely on patients to initiate the HIV testing process, it partially eliminates the barrier of their perception of their risk for the infection (OIG, 2013a; Pringle, Merchant, and Clark, 2013; Burke, Sepkowitz, Bernstein, Karpati, Myers, and Tsoi, 2007; CDC, 2006a; Fincher-Mergi, Cartone, Mischler, Pasieka, Lerner, and Billittier, 2002). Research indicates that patients often believe they are not at risk or have a low risk for infection from HIV (OIG, 2013a). For example, low risk perception was the most often cited reason for not having been tested for HIV (Kaiser Family Foundation, 2011), and Nunn, Zaller, Cornwall, Mayer, Moore, El, Dickman, Bechwith, and Kwakwa (2011) found that two thirds of the individuals they studied who tested positive for HIV believed they were at zero or low risk for HIV.

Routine testing also leads to both decreased HIV transmission and earlier treatment. Research, in the United States as well as elsewhere, shows that knowledge of HIV-positive status leads to decreased sexual transmission of HIV and a reduction in high-risk sexual behavior (Donnell et al. 2010; Sherr, Lopman, Kakowa, Dube, Chawira, Nyamukapa, and Oberzaucher, 2007; Lauby, Millett, LaPollo, Bond, Murrill, and Marks, 2008; MacKellar, Valleroy, and Anderson, 2006; Burke et al. 2007; Weinhardt, 2005; Marks et al. 2005; Lalani and Hicks, 2008). Knowledge of HIV-positive status also leads to more rapid treatment that can decrease serostatus and make the virus less infectious earlier in the disease progression (Cohen et al. 2011; Granich et al. 2009; Wawer et al. 2005; Chun, Justement, Moir, Hallahan, Maenza, Mullins, and Fauci, 2007; Pilcher et al. 2004; Castilla, Del Romero, Hernando, Marincovich, Garcia, and Rodriguez, 2005). If healthcare providers do not routinely offer HIV tests, many HIV infected persons may go undiagnosed, prolong the start of treatment, and may continue to engage in risky behaviors.

Unfortunately, research shows that routine testing does not occur consistently or frequently. In a 2011 Kaiser Family Foundation study, 74 percent of Americans reported that their provider had never suggested an HIV test (Kaiser Family Foundation, 2011). Other research found that less than 20 percent of patients reported getting their most recent HIV test as a part of their regular medical care (Dorell, Sutton, Oster, Hardnett, Thomas, Gaul, Mena, and Heffelfinger, 2011).

Research also suggests that routine HIV testing may occur infrequently and be inconsistently applied in community health centers (OIG, 2013a; Arya et al. 2012). Arya et al. (2012) found that community health center providers discussed HIV testing with only one-quarter of all their patients. The OIG, in an examination of HIV testing in community health centers, reported that only 20 percent of community health centers offered tests routinely and that only 7.4 percent of community health center patients (about 883,548 of nearly 12 million patients) received an HIV test in 2011 (OIG, 2013a).

Testing rates are low even among community health centers that report having implemented routine HIV testing policies and programs (Cunningham, Doran, DeLuca, Dyksterhouse, Asgary, and Sacajiu, 2009; Weis, Liese, and Hussey, 2009; Arya et al. 2012). Cunningham et al. (2009) found that even when HIV tests were offered, 65 percent of community health center patients still did not consent to the HIV test and reported declining HIV tests because they did not perceive themselves to be at risk for HIV or they had previously had an HIV test. This rate of refusal is around the same or higher than in many other settings such as urgent care clinics (67 percent refusal), emergency departments (study results ranged from 36 percent to 50 percent refusal) (Liddicoat, Losina, Kang, Freedberg, and Walensky, 2006; CDC, 2007; Calderon, Haughey, Leider, Bijur, Gennis, and Bauman, 2007; Lyons, Lindsell, Ledyard, Frame, and Trott, 2005).

The Role of Providers

Most research on HIV testing has focused on patients, utilizing a behavioral model of explanation that examines individual patient characteristics and help-seeking behaviors to predict the likelihood of being tested (see meta-analyses by Mullen et al.

2002 or Doyle et al. 2013). Provider-related variables have been included in some studies using the behavioral model of utilization. A review of 139 studies using this model found that about half considered the impact of providers on patient service utilization (Phillips et al. 1998). Most of the studies that included provider-related variables often considered whether or not the provider recommended a service to the patient. However, the research less often examined the characteristics of providers such as age, race, or gender on patient utilization. Only two of those studies included provider related variables using data obtained directly from the providers (i.e. provider perspectives) as this current study does.

The role of healthcare providers in the prevention of HIV has not been studied to the same extent as patient behavior even though healthcare providers may have greater impact on improving HIV prevention through testing. Research on other health issues indicates that focusing on providers and the factors that influence their decision-making explains more about utilization than focusing on patients. Stiffman, Catherine, Howarth, Hadley-Ives, Polger, Elze, and Pescarino, (2001) found that a provider based model accounted for over twice the variance in mental health service use (55 percent) than a patient based model (24 percent). Some research focused on providers has examined different factors that influence the medical decision-making processes of individual healthcare providers. These studies investigate the relative impact of provider characteristics such as age, gender, race/ethnicity, specialty, and clinical experience or factors such as caseload, and practice setting and location (Wright, Neugut, Wilde, Buono, Malin, Tsai, and Hershman, 2011; Edelman, Dinh, Moore, Schottenfeld, Fiellin, and Fiellin, 2012; Landon, Wilson, Wenger, Cohn, Fichtenbaum, Bozzette, Shapiro, and

Cleary, 2001; Cox, Graves, Marks, Tremblay, Stephenson, Lambert-Lanning, and Steben, 2011). For example, Bernstein, Begier, Burke, Karpati, and Hogben (2008) found that providers who were female, a member of a minority group, practiced in a large city (more than 250,000 people), had diagnosed HIV in the past 2 years, and had followed up with patients to see if they notified their sexual partners of their HIV status, were more likely to offer HIV tests to patients.

In fact, patients tend to rely on their providers for direction in health-related matters including those related to HIV. Research shows that a patient is far more likely to be tested for HIV when a healthcare provider recommends it (Doshi et al. 2013; Johnson, Mimiaga, and Reisner, 2009; Mimiaga, Goldhammer, Belanoff, Tetu, and Mayer, 2007; CDC, 2006b; CDC, 2005; MacKellar et al. 2005; Fernandez, Wilson ethier, Walter, Gay, and Moore, 2000; Harris, Stewart, Pratt, Woods, and Samples, 2004; Fernandez, Bowen, Perrino, Royal, Mattson, Arheart, and Cohn, 2003). One study specifically found that 82 percent of patients who had never been offered an HIV test said they would take one if a provider recommended it (Bond, Lauby, and Batson, 2005). A more recent study underscored these findings. Doshi et al. (2013) found that people in their sample (*N* = 78) who had not been tested for HIV reported that they relied on their healthcare providers' suggestion that they have an HIV test. Further, many patients said that a healthcare provider's recommendation that they have an HIV test was their primary reason for getting tested (Doshi et al. 2013). Minority patients are no exception. Forty percent of Hispanics and/or Latinos tested in 2011 said they did so because a healthcare provider advised it (Kaiser Family Foundation, 2011). The importance of provider recommendation is particularly important because there is a social stigma associated with HIV and potential hesitancy on the part of many patients to seek this service (Dillion and Basu, 2014; Saleh, Operario, Smith, Arnold, and Kegeles, 2011).

The Gateway Provider Model

The gateway provider model is a seemingly rarely used theoretical framework that focuses on the role of the provider in the provision of services (Stiffman, Pescosolido, and Cabass, 2004). It considers influences on an individual provider’s decision to act as a “gateway” to patient services. Gateway providers are usually front line medical personnel such as general practitioners who first identify a potential need for health services, and then provide medical attention and a plan of action (Stiffman, Cheng, Chen, and Dore, 1995). According to this model, the variables that influence gateway decision-making may be grouped into four broad categories: (1) need, (2) structural characteristics of the healthcare organization where the provider practices, (3) factors that predispose the provider to lean towards a certain decision, and (4) factors that enable a provider to make a certain decision. See the gateway provider model in Figure 4.

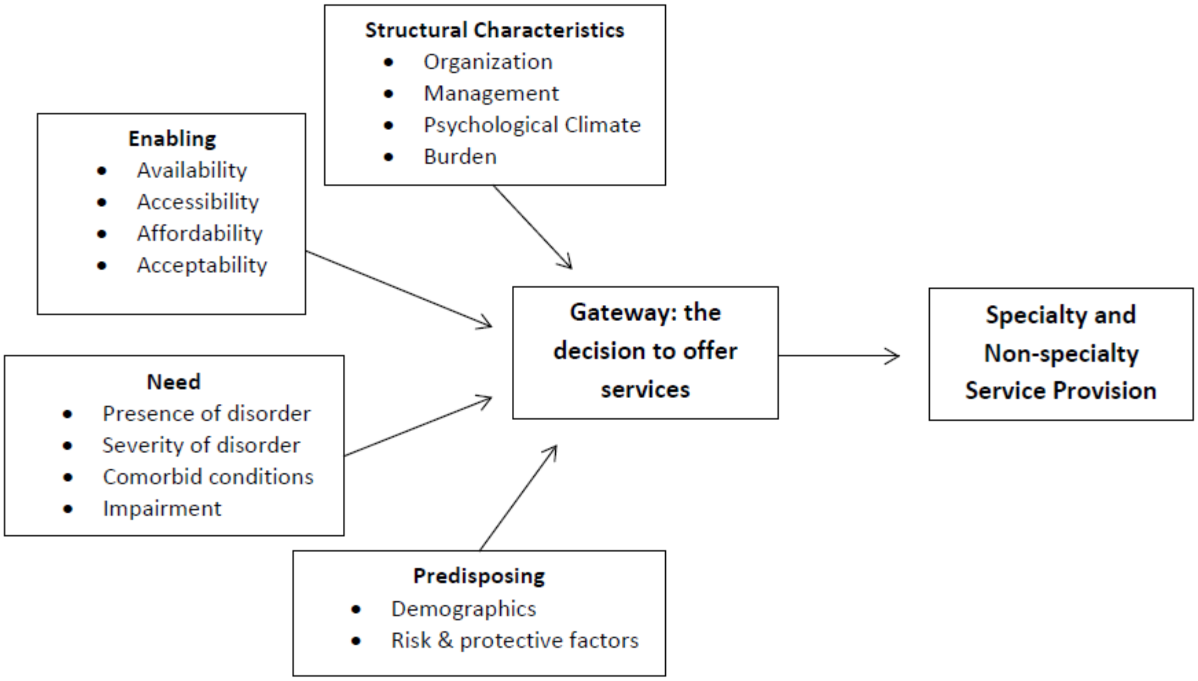


Figure 4. The gateway provider model.

Need encompasses the visible presence and severity of symptoms of a disorder as well as comorbid conditions and the degree of patient impairment. Provider perception of a patient' medical need has an obvious and important impact on the decision to provide services. In early research, Stiffman, Chen, Elze, Dore, and Cheng (1997) argued that "the gateway providers' perception of need (although often inaccurate) may determine the … pathway to services more than actual need and service availability" (1997, p. 341).   However, Stiffman et al. in a subsequent publication, add that "gateway providers often do not perceive the existence of need. Yet, that perception may be the most important determinant of service access" (2001, p.191).

Structural characteristics such as the organization, management of the organization, and the climate, or work environment, in which the provider practices may affect the provider's decision to offer services (Stiffman et al. 2004). These structural characteristics are critical to promoting or inhibiting access to services. Stiffman et al. argued that gateway providers, and their perceptions about what services are available through their organization, are influenced by the structural characteristics of their work environment and assert that their findings "demonstrate the critical role played by provider perceptions, which are influenced more by work environment than by client problems" (2001, p.188).

Patient demographics, risk, and protective issues are considered predisposing factors. These factors condition a provider's decision to offer services or not. A great deal of literature illustrates how members from certain demographic groups are diagnosed and treated differently than whites even after controlling for protective issues such as insurance coverage and socioeconomic status (Dolezsar, McGrath, Herzin, and Miller, 2014; Wagner, Tennen, Feinn, and Finan, 2014; Hudson, Puterman, Bibbins-Domingo, Matthews, and Adler, 2013; LaVeist, 2005; Shi and Stevens, 2004; Levine, Fosters, and Fullilove, 2001; Williams and Jackson, 2005; Minino, Arias, and Kochanek 2002).

Finally, enabling factors facilitate (or impede) patient access to medical services. These include things such as service availability, accessibility, affordability, and acceptability. For example, the legal availability of services in the State may affect a provider's decision to offer or recommend services (HRSA, 2013a). Additionally, affordability is a concern that can impede access to certain services (Pinkerton, Bogart, Howeton, Snyder, Becker, and Asch, 2010; Phillips and Fernyak, 2000). Providers may take into account whether or not a patient's insurance covers a service or whether the patient is able to pay for the services rendered. Finally, whether or not the patient will accept a proposed service is also a factor that the provider takes into consideration.

The gateway provider model incorporates aspects from the network-episode model and decision theory.

The Network-episode Model

The network –episode model is a medical sociological model that was developed in the early 90s by Bernice Pescosolido in efforts to understand how people identify and respond to health issues, as well as how they use health care services (Pescosolido, 1991; Pescosolido, 1992). According to the network-episode model, interactions within social networks are the way through which health decision-making occurs. Additionally, these interactions are shaped by the structure and content of the network (Kincaid, 2004). The model posits that there are multiple systems or networks, some internal and some external, that shape health, illness, and outcomes. The network-episode model derives from social exchange and social network theory and focuses on providers who can respond to health problems, noting that these providers can work in opposition to or in favor of provision of care and positive outcomes (Edmonds, 2012). Additionally, the network-episode model acknowledges that the patient's community, culture, and climate in healthcare settings result in treatment decisions (Pescosolido, 1992). Little is known, however, about the factors that influence the decisions by community health centers to use either targeted or routine HIV testing.

The network-episode model has, through multiple applications, illustrated how people access care. For example, research that studied youth with psychiatric needs found that family, community and school, as well as treatment systems were pathways to accessing care (Boydell, Volpe, Gladstone, Stasiulus, and Additionton, 2013). Another study that examined pregnancy and childbirth in Bangladesh found that place of birth decisions was explained by network content and that network content explained more than individual attributes (Edmonds, Hruschka, Bernard, and Sibley, 2012).

Decision Theory

The gateway provider model also draws from decision theory. Decision theory is not specific to medical sociology but instead comes from the fields of economics, psychology, and mathematics. However, it is helpful in understanding why patients and providers make the choices they do. Decision theory seeks to explain how and why people or groups of people make certain decisions when presented with multiple options, as well as at least some knowledge about the outcomes of these options (Albert, 1978). Further, decision theory postulates that how healthcare providers make decisions about patients' treatment are rationally based (Brennan, 1995). According to Brennan, decision theory is especially helpful in healthcare decisions because the decisions often involve risk, uncertainty, and the need to meet several competing interests (1995). HIV testing is an excellent example of this – providers make decisions about who should receive an HIV test and who should not while working within the context of competing interests (limited funding, limited time with each patients etc.).

Much like the network-episode model acknowledges that community, culture, and climate in healthcare settings affect treatment decisions (Pescosolido, 1992). Decision theory acknowledges that five major elements affect decisions: (1) alternatives, (2) events, (3) probabilities of events, (4) outcomes, and (5) values associated with the outcomes (Brennan, 1995). In this way, both the network-episode model and decision theory acknowledge that there are multiple influences on a provider’s decision about how to treat patients, which in this study is conceptualized as multiple influences on a community health center’s HIV testing approach. Stiffman et al. describe how the network-episode model and decision theory work together to form the gateway provider model: “the gateway provider model draws insights from the network-episode model to understand which treatment and community interface factors need to be explicitly considered in the treatment decisions, whereas decision theory describes the selection and matching process of those considerations in any intervention” (Stiffman, 2004, p.191). In short, according to decision theory, gateway providers must make decisions (that are assumed to be rationally based) about how to treat a patient (i.e. offer an HIV test or not). Coupled with notions from network-episode model that there are many influences, including community, culture, and healthcare environment, on that provider’s decision and the gateway provider model is constructed.

In summary, the gateway provider model focuses on three aspects. First, it draws from network-episode model the focus on a provider who acts as a gateway to services (Stiffman et al. 2004). These providers often offer only primary care and may not specialize in treatment of certain conditions such as HIV/AIDS – very similar to community health centers. Second, it draws from decision theory the idea that providers can make the best decision regarding services for their patients if and when they are more knowledgeable (about a variety of things including what options are available for treatment after diagnosis). Third, the gateway provider model acknowledges that providers are influenced by a variety of factors including their own perceptions and attitudes, healthcare system variables such as policies and funding, the external environment such as the community in which they practice, and community resources such as availability of services and treatment for patients in the community.

Proposed Model – Macro Level

Gateway providers may function as either individual agents or as organizations. For example, because community health centers focus on primary care and offer a core set of services, they also serve as gateway providers. They often see patients who need to be referred to specialists (i.e. podiatrists, cardiologists etc.), or who need other types of services or medical care beyond its scope of provision.

The gateway provider model has primarily been used to examine individual providers. It has not been employed to examine gateway provider organizations such as community health centers. However, community health centers serve as a gateway for HIV testing and any subsequent treatment, if necessary, for the patients they serve. These centers are likely influenced by groups of factors similar to those that affect individual providers. A gauge of patient need at the macro level may be the community health centers' perception of the local population's risk for HIV. Structural characteristics, such as the community health center's HIV testing policies and funding specifically for HIV testing may influence it HIV testing approach. The demographic characteristics of the external environment in which a community health center is located may serve as predisposing factors that influence its testing approach. These include the percentage of the population that is poor, Black or Hispanic and/or Latino. Finally, enabling factors for community health centers may include the availability of local resources such as a local HIV and sexually transmitted disease (STD) testing center or a local Ryan White provider. See Figure 5.

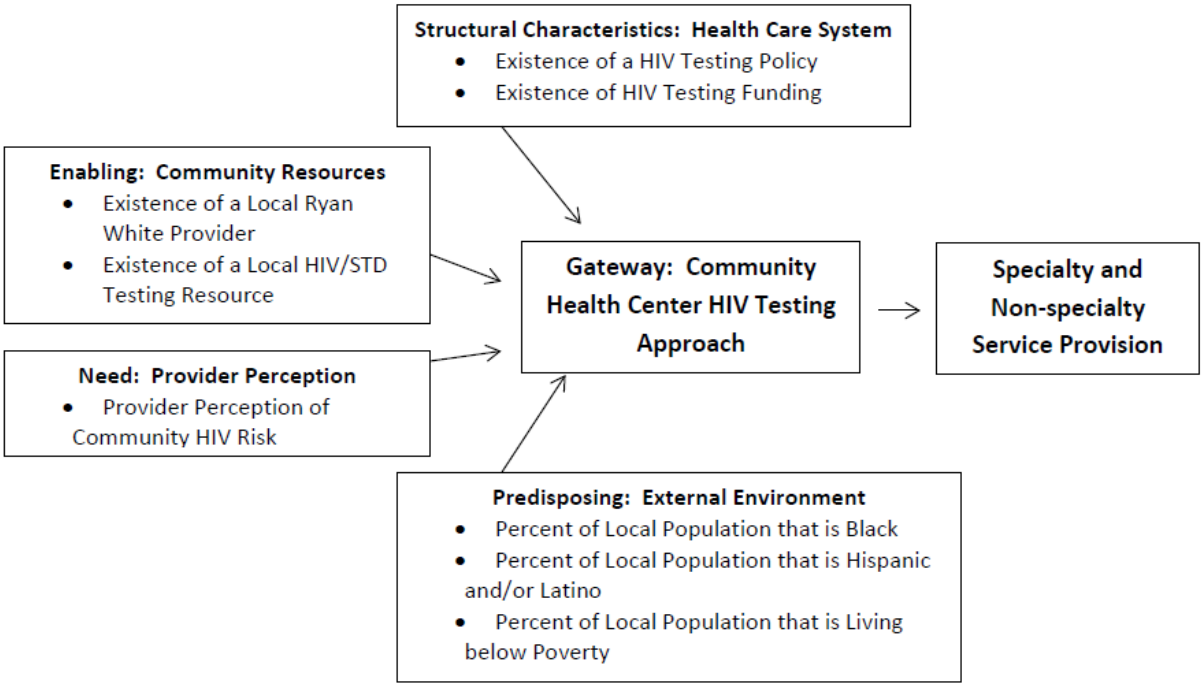


Figure 5. Proposed model.

What Influences Community Health Centers HIV Testing Approach

Scant research has examined factors that influence HIV testing in community health centers. Johnson et al. (2011) conducted qualitative interviews with personnel from 30 community health centers in Massachusetts regarding the factors they believed either facilitated or served as barriers to implementing routine HIV testing. Barriers included provider time constraints, lack of funding, staff, and space, as well as provider, patient, and community discomfort with HIV testing. Organization buy-in to HIV testing as well as provider, patient, and community education were reported as methods of facilitating a routine HIV testing approach (Johnson et al. 2011). This organizational buy-in leads to multiple aspects that encourage HIV testing, such as participation of front line staff and dedicated funding. Other studies that focus on community health centers have examined implementation of a routine HIV testing program in community health centers (Myers et al. 2009), and language barriers when offering routine HIV testing in community health centers (Arya et al. 2012). While these studies examined community health centers and HIV testing from important aspects, they did not consider the community health center as a whole nor did it consider macro and community level influencing factors.

Research repeatedly shows the link between HIV and community level factors (CDC, 2011d; Singh Setia, Quesnel-Vallee, Curtis, and Lynch, 2009; Johns, Bauermeister, and Zimmerman, 2010; Taylor, Leibowitz, Simon, and Grusky, 2006). These scholars advocate for the need to identify the macro level factors that influence a community health center to make decisions about provision of certain services such as their HIV testing approach. These factors include (1) need – the community health centers provider's perception of community HIV risk, (2) structural characteristics - healthcare system variables, (3) predisposing factors - external environment, and (4) enabling factors such as community resources.

Need: Provider Perception of Community HIV Risk

Community health center providers' perception of patients and community member's HIV risk and the need for regular testing may influence its HIV testing approach (Stiffman et al. 1997; Stiffman, Hadley-Ives, Dore, Polgar, Horvath, Striley, and Elze, 2000; Stiffman, Freedenthal, Dore, Ostmann, Osborne, and Silmere, 2006). For example, Stiffman et al. 2006 found that provider assessment of patient need is predictive of services offered to patients.   When providers perceive their patients and community members to be at risk for HIV, they may be more likely to offer an HIV test and research shows that patients are more likely to accept a routinely offered test when a doctor recommends it (Doshi et al. 2013; Kaiser Family Foundation, 2011; Johnson et al. 2009; Mimiaga et al. 2007; CDC, 2006b; Bond et al, 2005; CDC, 2005; MacKellar et al. 2005; Fernandez et al. 2000; Harris et al. 2004; Fernandez et al. 2003).

However, some research in the United States as well as elsewhere, indicates that many healthcare providers do not believe their patients are at risk for HIV or engage in HIV risky behaviors (Tucker, Walensky, Yang, Yang, Bangsberg, Chen, and Cohen, 2012; Taylor et al. 2006). For example, a recent study by Tucker et al. (2012) found that providers in China did not initiate HIV testing, even with patients at clinics focused exclusively on sexually transmitted disease, because they didn't perceive a high prevalence of the disease in the community. Tucker and his colleagues (2012) found that providers in such clinics offered HIV tests to 28 percent of their patients, and providers reported not offering more HIV tests because they perceived a low prevalence of HIV and that HIV testing was not recommended by current guidelines. Other research, especially in the United States, found variation in perception of risk for HIV infection at the community level (Taylor et al. 2006). Taylor et al. found that physicians in zip codes with higher density of African Americans were more likely to test for HIV than in zip codes with higher density of Whites or Latinos. Interestingly, this testing was true regardless of the individual patient's race and ethnicity, the prevalence of AIDS in the zip code, or the presence of HIV testing sites in the zip code. However, zip codes with a high density of Latinos weren't any more likely to test than were zip codes with high density of Whites. This variation is interesting and concerning because Hispanics and/or Latinos represent one of the more vulnerable HIV groups in which rates of HIV are disproportionately increasing.

Misperception of risk by healthcare providers may be explained, in part, by a lack of comfort discussing certain types of sexual matters with patients. Research has shown that provider discomfort with discussion of sexual behaviors and identity as well as provider's misperception about a patients' HIV risk, are barriers to testing (Petroll and Mosack, 2011; Korthuis, Berkenblit, Sullivan, Confrancesco, Bass, Bashook, and Sosman, 2011; Partridge, Collini, and McKendrick, 2009; Bokhour, Solomon, Knapp, Asch, and Gifford, 2009; Anaya, Hoang, Golden, Goetz, Gifford, Bowman, and Asch, 2008; Mahajan, Sayles, Patel, Remien, Sawires, Ortiz, and Coates, 2008; Pathela, Hajat, Schillinger, Blank, Sell, and Mostashari, 2006; Wimberly, Hogben, Moore-Ruffin, Moore, and Fry-Johnson, 2006; Verhoeven, Bovijn, and Helder, 2003; Nunn et al. 2011; Montano, Phillips, Kasprzyk, and Greek, 2008; Grodensky, Golin, Boland, Patel, Quinlivan, and Price, 2008; Tao, Irwin, and Kassler, 2000; Wimberly and Moore, 2003).

Structural Characteristics: Healthcare System Variables such as Policies and Funding

Stiffman and colleagues have argued that gateway healthcare provider perceptions and knowledge are influenced by the structural characteristics of their work environment. Moreover, they assert that provider perceptions "are influenced more by work environment than by client problems" (2001, p.188). The work environment or healthcare delivery system includes the "policies, resources, organization, and financial arrangements influencing the accessibility, availability, and acceptability of medical care services" (Phillips et al 1998, p.574).

Organizational policy and/or procedures have been shown to affect the implementation of routine testing (Johnson et al. 2011; Durlak and DuPre, 2008; Ginexi and Hilton, 2006; Rohrbach, Grana, Sussman, and Valente, 2006; Miller, Bedney, Guenther-Gray and the City Project Study Team, 2003; Ramos and Ferreira-Pinto, 2002). Johnson et al. (2011) reported that personnel felt organizational support and buy-in was needed to facilitate routine HIV testing in their community health centers. They reported that this buy-in could come in many forms, including a community health center wide routine HIV testing policy. Durlak and Dupre (2008) reviewed 81 studies regarding implementation of health program policies and programs and found that organizational functioning and training and technical assistance affected implementation.

Other research found that policies played an important role in HIV risk assessments and counseling as they constitute part of the HIV testing process (Myers, Steward, Charlebois, Koester, Maiorana, and Morin, 2004). For example, Myers et al. (2004) found that patients in healthcare settings with testing policies received HIV prevention counseling more frequently than patients in healthcare settings without testing policies - indicating that procedures or policies lead to provision of counseling. Policies also influence how and when HIV prevention counseling occurs in healthcare settings, and in the absence of policy, providers tend to rely on their own judgment about HIV testing and prevention (Morin, Koester, Steward, Maiorana, McLaughlin, and Myers, 2004).

Research shows that implementation of an HIV testing policy leads to significantly increased patient assessment rates—from 65 to 99.9 percent. Half of patients who tested HIV positive would not have been identified if a routine HIV testing policy had not been implemented (Greenwald, Rich, Bessega, Posner, Maeda, and Skolnik, 2006). One study found that as many as 83 percent of patients were tested after a routine HIV testing policy was piloted in six community health centers (Myers, Modica, Dufour, Bernstein, and McNamara, 2009). The impact of policy is not specific to the United States. A study in Brazil found that a routine testing policy for pregnant women led to a greater uptake in testing which ultimately led to fewer mother to child HIV transmissions (Chandisarewa, Stranix-Chibanda, Chirapa, Miller, Simoyi, Mahomva, Maldonado, and Shetty, 2007).

The results are similar in other healthcare settings. For example, a policy change from voluntary to routine HIV testing in a hospital dramatically increased HIV testing over 3 years (Byamugisha, Tylleskar, Kagawa, Onyango, Karamagi, and Tumwine, 2010). This phenomenon is not specific to the United States. A study of public health centers in Brazil produced similar findings: centers with routine testing policies diagnosed a statistically significant higher number of patients with HIV than those with non-routine HIV testing policies (Bergenstro and Sherr, 2010).

Implementation of an HIV testing policy may also change attitudes toward testing. For example, research conducted in West Africa, specifically in Cote d'Ivoire, examined implementation of a routine HIV testing policy for pregnant women found that the proportion of health facility staff in favor of recommending an HIV test increased significantly after policy implementation (from 82 percent to 98 percent) (Delvaux, Diby Konan, Ake-Tano, Gohou-Kouassi, Bosso, Buve, and Ronsmans, 2008). The proportion of staff or their wives willing to be tested for HIV if the wife was pregnant increased from 59 percent to 86 percent. Research in the United States found a similar trend. A study conducted in an urban hospital in Boston, Massachusetts found that patients admitted during the period of routine HIV policy implementation were 3.4 times more likely to take an HIV test than patients admitted during other periods (Walensky, Losina, Steger-Craven, and Freedberg, 2002).

With regard to testing procedures, research shows that establishing the prevalence of undiagnosed HIV in a community is key to creating policy that addresses the question of routine versus targeted testing (Weiss and Chitalu, 2014; Dievler and Pappas, 1999). Undiagnosed HIV prevalence is calculated by dividing the number of newly diagnosed HIV cases (undiagnosed HIV prior to the test) during a specific time frame (i.e. a year) by number of people in the community. Prevalence of undiagnosed HIV can indicate to a community health center whether or not routine HIV testing is warranted. For example, according to CDC, if a community health center tests enough patients to establish an undiagnosed HIV prevalence of less than 0.1 percent, routine testing may not be warranted. However, if a community health center tests enough patients to establish an undiagnosed HIV prevalence of greater than 0.1 percent, routine testing is likely needed (CDC, 2006a). Unfortunately to establish the prevalence of undiagnosed HIV in a community, a health center would need to test at least 4,000 patients (Qaseem, Snow, Shekelle, Hopkins, and Owens, 2009). Testing 4,000 patients is expensive and time-consuming and may be difficult for community health centers that serve a small number of patients or have limited HIV testing funding.

Lack of funding is often cited as a barrier to routine HIV testing (Kelly, Somlai, Benotsch, Amirkhanian, Fernandez, and Stevenson, 2006; OIG, 2013a). HIV tests are relatively expensive with the average cost of HIV testing and counseling ranging from $10 to $48 for an HIV-negative test and from $64 to $93 for a positive test (Pinkerton et al. 2010; Phillips and Fernyak, 2000). In a OIG study of HIV testing in community health centers, 43 percent reported that they received funding specifically for HIV testing. Health centers that received this funding were more likely to adopt routine HIV testing than those that did not, but only 32 percent of health centers reported that they had sufficient funding to offer free or reduced-cost HIV tests (OIG, 2013a).

Availability of sufficient funding obviously has an impact on a community health center's ability to routinely administer HIV tests. Research shows that access to HIV tests often depends upon whether or not a facility allocates resources to providing HIV tests, buying HIV tests, or prioritizing HIV tests over other laboratory services (Burke et al. 2007; Greenwald, Hall, and Skolnik, 2006; Prost, Chopin, McOwan, Elam, Dodds, and Macdonald, 2007). Providers in community health centers often express concerns about the resources required for routine HIV testing even when they have a dedicated funding stream (Johnson et al. 2011). For example, in this study that examined HIV testing funding, one frustrated respondent said "Who is going to pay for it? Even though insurance will pay for it for the patients, does that mean premiums are going to go up? So somebody's paying for it, but how do we all pay for it? (Johnson et al. 2011, p.650)." An organization's perception of the finite nature of funding for a program like routine HIV testing may be underscored by demographics of the neighborhood in which it is situated.

Predisposing Factors: External Environment variables such as Vulnerable Populations

Community health centers are often located in areas that are disproportionately poor and consist of vulnerable and medically underserved populations. Being located in this type of environment may influence a community health center in two basic ways. It may increase awareness that vulnerable populations such as Blacks, Hispanic and/or

Latinos, or other persons living in poverty, are at increased risk for HIV and, therefore provide greater recognition of the need for HIV testing. For example, one study found that residents in communities with a high concentration of Blacks were more likely to have an HIV test than those with high concentrations of whites. Moreover, the percentage of Blacks in a community was more strongly correlated to HIV testing rates than the number of AIDS diagnoses in the community (Taylor et al. 2006). When communities have an increased prevalence of HIV, they often become the focus of testing campaigns by public health organizations (Ibid.).

The external environment may also influence a community health center in the other direction. Because vulnerable populations tend to be at greater risk, community health centers may assume that because there are other organizations that may target these vulnerable populations for HIV prevention that outreach efforts have already addressed the local need for routine testing. As a result, community health centers may focus instead on dealing only with the immediate concern of the patient (i.e. cold, stomach flu etc.).

The HIV/AIDS epidemic disproportionately affects these vulnerable populations at every stage of the disease, especially with regard to testing and diagnoses (CDC, 2011b; CDC, 2011c; CDC, 2010a). For example, disparities in HIV diagnoses among Blacks and Hispanics and/or Latinos compared with whites have been well documented (CDC, 2007; Hall, Byers, Ling, and Espinoza, 2007). Blacks represent 14 percent of the United States population, but comprise 44 percent of all new HIV infections (CDC, 2011c) and Hispanic and/or Latinos represent 16 percent of the United Stated population, but account for 20 percent of all new HIV infections (CDC, 2011a). Despite high rates of HIV diagnoses, members of these racial and ethnic populations do not appear to be tested for HIV as often as whites and therefore, may continue to remain unaware of their HIV infection. For example, a survey conducted with men who have sex with men in several United States cities indicated that 91 percent of Blacks and 68 percent of Hispanics and/or Latinos were unaware of their HIV infection compared with 60 percent of whites (MacKellar et al. 2005). More recent research, not specific to men who have sex with men, shows that a similar pattern remains. The percentages of Blacks and Hispanics and/or Latinos who were unaware of their infection were higher (19 percent and 20 percent respectively) than that percentage of Whites who were unaware of their infection (15 percent) (Hall, Frazier, Rhodes, Holtgrave, Furlow-Parmely, Tang, Gray, Cohem, Mermin, and Skarbinski, 2013).

Research also shows that patients who live in poverty are less likely to have had an HIV test even though this population is known to be disproportionately affected by HIV. The lack of testing may also be attributable to decreased access to healthcare in general (Prentice, 2006; Kirby and Kaneda, 2005).

HIV and Blacks

Community health centers are tasked with providing services tailored to the local area. Community health centers may be influenced to provide routine HIV testing by the fact that Blacks are the group most affected by HIV in the United States, comprising 44 percent of all new HIV infections (CDC, 2011c). Black men account for 70 percent of new HIV infections among this population (CDC, 2011c). New infection rates among Black women, while much lower than that of Black men, are considerably higher than those of white women. The rate of new HIV infection for Black women is 15 times higher than the rate for white women (CDC, 2011c). Blacks of both sexes are also much more likely than whites to present for HIV testing late in their course of infection (CDC, 2014, CDC, 2003).

Blacks tend to experience a number of structural challenges that contribute to the high rate of HIV infection and community health centers must take these into consideration when determining their HIV testing approach. For example, many Blacks face socioeconomic issues such as poverty and limited access to healthcare that increases the risk for HIV infection (National Poverty Center, 2012; Kaiser Family Foundation, 2007). Adding to these issues are the stigma, homophobia, and perceptions about HIV testing common in Black culture (Hailey and Lamont, 2012; Saleh et al. 2011). Research indicates that the stigma and shame associated with HIV and fear of homophobic reactions from healthcare providers serve as real barriers to HIV diagnosis and treatment among Black men who have sex with men (Radcliffe, Doty, Hawkins, Gaskins, Beidas, and Rudy, 2010; Kinsler, Wong, Sayles, Davis, and Cunningham, 2007).

Blacks also tend to perceive and experience discrimination from healthcare providers. Williams (2003 and 1999) found that personal discrimination and institutional racism can affect minority patient's health in a variety of ways such as racial bias in medical care or through residence in poorer neighborhoods. Minority patients are more likely to perceive prejudice in care than are whites (Johnson, 2004a). Research also shows that providers dominate conversations and use less patient-centered language with Blacks compared to white patients (Johnson, 2004b). In addition, providers may hold racial stereotypes about their patients such as believing that minority patients do not adhere to treatment regimens or follow medical advice (Smedley, Stith, and Nelson, 2002).

HIV and Hispanics and/or Latinos

Community health centers that are tasked with providing services customized to the communities in which they are located may be influenced to provide routine HIV testing by the alarming statistics regarding Hispanics and/or Latinos and HIV – this population accounts for 20 percent of all new HIV infections (CDC, 2011a). The CDC estimates that 1 in 36 Latino men and 1 in 106 Latino women will be diagnosed with HIV in their lifetime (CDC, 2011a). The potential impact of the HIV epidemic is significant when those figures are coupled with a prediction that nearly one-third of the United States population will be Hispanic and/or Latino by 2050 (United States Department of Commerce, 2011). Like Blacks, Hispanic and/or Latino men account for a far greater share of new HIV infections than women. Hispanic and/or Latino males account for 79 percent of new HIV infections among their population (CDC, 2011a). The lifetime risk for HIV among Hispanics and/or Latinos is nearly three times the risk for whites (CDC, 2011a). Despite the high prevalence of HIV within this community, 44 percent of the Hispanic and/or Latino population report never being tested for HIV (Kaiser Family Foundation, 2011). Research estimates that nearly one-quarter of Hispanic and/or Latinos living with HIV remain undiagnosed because they have not been tested (Campsmith, Rhodes, Hall, and Green, 2010).

Community health centers located in communities with high proportions of Hispanics and/or Latinos may be influenced to provide routine HIV testing to avoid the negative health outcomes associated with this population and HIV. Research has shown that the increased risk of HIV in Hispanics and/or Latinos results in negative health actions and outcomes (CDC, 2013d; Chen, Gallant, and Page, 2011; Lopez-Quentero, Sharkshall, and Neumark, 2005; Pulerwitz, Amaro, De Jong, Gortmaker, andRudd, 2002; VanOss, 2003; Morin, Sengupta, and Cozen, 2002). For example, HIV/AIDS is the fourth leading cause of death among middle aged Hispanics, compared to the tenth leading cause of death among whites (CDC, 2010c). Additionally, Hispanics and/or Latinos are less knowledgeable about HIV treatment than whites (Ebrahim, Anderson, Weidle, and Purcell, 2004), and delay having an HIV test and seeking HIV treatment and care more often than any other minority group (Espinoza and Hall, 2009; Espinoza, Hall, Selik, and Hu, 2008; Hall, Geduld, Boulos, Rhodes, An, and Mastro, 2009; Yang, Chan, Mohammad, Meyer, Risser, and Chronister, 2010; Samet, Freedberg, Savetsky, Sullivan, and Stein, 2001; Turner, Cunningham, and Duan, 2000).

Community health centers are specifically designed to provide health services in a linguistically and culturally appropriate setting, a unique challenge for centers that serve communities with high proportions of Hispanics and/or Latinos. Research shows that Hispanics and/or Latinos experience challenges such as immigration problems, language barriers, and cultural stereotypes that may contribute to their high rate of HIV infection. These challenges may also influence the ways in which community health centers provide services, including HIV testing, to this population. For example, serving a large immigrant population may influence community health centers’ HIV testing approach because patient’s immigration status can create real barriers to healthcare. Almost one half of Hispanics and/or Latinos diagnosed with HIV between 2001 and 2004 were born outside of the United States (CDC, 2011a; Johnson, Sorvillo, Wohl, Bunch, Carruth, and Castillion, 2003). Research shows that undocumented Hispanic and/or Latino immigrants often fear of disclosure of immigration status and thus avoid healthcare providers out of fear of exposure (Bustamante, Fang, Garza, Carter-Pokras, Wallace, Rizzo, and Ortega, 2012; CDC, 2007; Diaz, 2000; Levy, Page-Shafer, Evans, Ruiz, Morrow, and Reardon, 2005; Levy, Prentiss, Balmas, Chen, Israelski, and Katzenstein, 2007; Lopez-Quintero et al. 2005; Olshefsky, Zive, Scolari, and Zuniga, 2007). Community health centers must take such factors into consideration and work to eliminate these barriers by gaining the trust of their community in order to provide services. In addition, fewer number of years of residency in the United States is associated with less knowledge about HIV, lower perceived risk, and lower testing rates (Espinoza, Hall, Selik, and Hu, 2008; Liddicoat et al. 2006; Lopez-Quintero et al. 2005; Miller, 2000).

Community health centers may also take into consideration and be influenced by the language barriers when addressing the needs of their Hispanic and/or Latino communities. Language differences can be a barrier for Hispanics and/or Latinos when seeking healthcare (Lebrun, 2012). Language barriers can limit interaction with healthcare providers and prohibit patients from obtaining critical information such as information about HIV risk and the need to be tested (Lopez-Quintero et al. 2005; Loue, Cooper, and Fiedler, 2003) For example, Levy et al. (2005) found that Hispanic and/or Latinos who preferred to be interviewed in Spanish rather than English were less likely to have ever been tested for HIV. Thus, community health centers may recognize these language barriers and provide HIV testing services in a way that reaches populations whose native language is not English.

Finally, community health centers may be influenced by cultural factors such as traditional gender roles in the Hispanic and/or Latino community that can affect dialogue and communication about HIV and HIV tests (Lee, Dancy, Florez, and Holm, 2013; Gilbert and Rhodes, 2013; Cardoza, Documet, Fryer, Gold, and Butler, 2012; Diaz, 2000). For example, Lee et al. (2013) found that HIV intervention programs for Latino youth were more successful when they were culturally and gender specific and emphasized that providers need to understand culturally related gender roles and their impact on sexual behavior. Community health centers that know the populations they serve well may be influenced to provide HIV testing services in way that accounts for these culturally specific gender roles that affect social status.

HIV and Persons Living in Poverty

Community health centers that service communities with large proportions of people living in poverty may be influenced by the fact that this population is also disproportionately affected by HIV. The CDC found that while less than 1 percent of the general population has HIV, 2.1 percent of heterosexuals living in high poverty urban areas are infected with HIV (CDC, 2010a). The relationship between poverty and HIV is bi-directional. Being poor may place individuals at increased risk for HIV, while at the same time, having HIV may place individuals at increased risk for falling into poverty (Bates, Fenton, Gruber, Lalloo, Lara, and Squire, 2004). While poverty status is not causally linked to HIV infection rates, poverty certainly increases vulnerability to HIV. For example, research shows that concurrent sexual partners, which can spread HIV, is linked to community level poverty (Adimora and Schoenbach, 2005; Adimora and

Schoenbach, 2002). This may occur because poverty may lead to interfere with or postpone marriage, leading people to engage in sex with multiple partners.

Additionally, community health centers' HIV testing approach may be influenced by the barriers faced by the poor populations they serve. For example, poverty is often associated with lack of access to healthcare, lack of education, and illiteracy, all of which can reduce the healthcare encounter opportunities and effectiveness of HIV risk and prevention messages. In some situations, poverty constrains choices and leaves only risky behavior options (Weiser, Leiter, Bangsberg, Butler, Percy-de Korte, Hlanze, Phaladze, Iacopino, and Heisler, 2006). For example, poverty may lead some persons, most likely women and men who have sex with men, to engage in sex work to support themselves, an activity associated with high risk for HIV (Collins and Rau, 2000). Research conducted in Swaziland, the country with the highest HIV prevalence in the world, found that among mothers, poverty led to hunger of themselves and their children, which in turn led to sex work which lead to HIV infection (Fielding-Miller, Mnisi, Adams, Baral, and Kennedy, 2014). Community health centers that serve populations with limited options may be influenced to provide HIV tests in a certain manner, routine or targeted.

Research at the community level has repeatedly shown a link between HIV and local poverty levels (CDC, 2011d; Singh Setia et al. 2009; Johns et al. 2010; Taylor et al. 2006). Some research found that patients reported more HIV testing in poorer communities and less HIV testing in communities with high HIV prevalence (Johns et al. 2010). Other research found the opposite – that people living in the most materially deprived neighborhoods were the least likely to have had an HIV test (Singh Setia et al.

2009). Specifically, Singh Setia et al. (2009) found that people living in the most materially deprived communities were about 40 percent less likely to have ever had an HIV test compared with those living in the least deprived communities.

Research also shows that HIV and AIDS incidence is also disproportionately higher in poorer communities, not only in the United States but across the globe (Gabrysch, Edwards, and Glynn, 2008; Mari-Dell'Olmo, Rodriguez-Sanz, and Garcia-Olalla, 2007; Msisha, Kapiga, and Earls, 2008; Zierler, Krieger, Tang, Coady, Siegfried, DeMaria, and Auerbach, 2000). For example, communities with more than 40 percent of the population living below the poverty line had seven times the HIV/AIDS incidence than communities with less than 2 percent of the population living below the poverty line (Zierler et al. 2000). Further, HIV services are less accessible in disadvantaged communities. Specifically, fewer HIV services are found in economically disadvantaged and immigrant communities (Kaukinen and Fulcher, 2006).

Enabling Factors: Local Resource Variables such as Ryan White Programs and HIV/STD Testing Resources

Resources available to a community health center may influence its HIV testing approach. These resources are not always financial and often come in the form of additional services and connections that may influence decision-making at community health centers. Examples of these resources include Ryan White HIV/AIDS programs and HIV/STD testing resources.

The United States Congress authorized the Ryan White Comprehensive AIDS Resources Emergency Act, which currently provides support for a variety of programs for persons living with HIV, in 1990 (Parham and Conviser; 2002). These programs are named for Ryan White, a young man who acquired AIDS through a blood transfusion at age 13. He and his family fought against HIV and AIDS discrimination and encouraged HIV and AIDS education. Ryan White died only months before Congress authorized the legislation that bears his name, at age 18. However, Ryan White programs continue; Congress has continuously reauthorized the programs (in 1996, 2000, 2006, and 2009) (HRSA, 2014a)

Ryan White programs provide primary healthcare to over 500,000 people living with HIV/AIDS every year and have programs specifically for women, infants, children, and youth (HRSA, 2014b). Additionally, some Ryan White programs fund dental programs or programs that provide funding to address the disproportionate effect of HIV/AIDS on minority communities (HRSA, 2011a). Because Ryan White programs are meant for those already living with HIV or AIDS, only a small portion of a Ryan White program may go towards HIV testing. However, Ryan White programs are typically located in areas with the greatest need (such as a community with a high HIV prevalence) so the presence of a local Ryan White program may influence a community health center by alerting it to the increased HIV needs of the community in which it is located.

HIV/STD testing resources are more general than Ryan White programs in that they are not focused solely on patients already diagnosed with HIV/AIDS. These resources might be found in a variety of places. For example, HIV/STD testing resources may be located in local health departments, universities, or churches (CDC, 2010b).

Community health centers with these local resources may be influenced to use a targeted HIV testing approach in order to conserve their resources (such as HIV tests) because patients can go to these local resources for an HIV test if needed. Alternatively, community health centers in communities with local resources may be influenced to use a routine HIV testing approach because they know that HIV testing is socially accepted in the community and needed. For example, research shows that the degree to which HIV testing services, such as HIV/STD testing resources, are visible in a community may positively influence social norms and decrease HIV testing stigma and discrimination, both important factors in HIV testing (Cohen, Scribner, and Farley, 2000; Maman, Abler, Parker, Lane, Chirowodza, and Ntogwisangu, 2009). Additionally, the existence of a Ryan White program or an HIV/ STD testing resource may indicate community awareness of HIV, AIDS, and other STDs in their community, as well as greater access to HIV testing resources. The presence of these resources makes health services available to the community.

The mere existence of a local resource is not enough to directly influence service provision. Providers must also be knowledgeable about its availability because this tends to increase the opportunities for utilization (Striley, Stiffman, and Spitznagel, 2003). Knowledge of these resources at the community health center is key to service provision. Research indicates that patients received services more often when providers were familiar with and connected to other providers in the community (Bunger, Stiffman, Foster, and Shi, 2010). Additionally, several studies identified how lack of knowledge about service availability, cost, and access were barriers to delivering Ryan

White program assistance to needy patients (Hirschhorn, Landers, McInnes, Malitz, Ding, Joyce, and Clearly, 2009; Marx, Hirozawa, Soskolne, Liu, and Katz, 2001).

Summary

In summary, the gateway provider model stems from the network-episode model and decision theory. The gateway provider model theorizes and research shows that multiple factors may influence community health centers to provide HIV testing in either a routine or targeted manner. Those factors include (1) need – the community health centers provider’s perception of community HIV risk, (2) structural characteristics - healthcare system variables such as policies and funding, (3) predisposing factors – the external environment such as the presence of vulnerable populations (Blacks, Hispanics and/or Latinos, and persons living in poverty), and (4) enabling factors such as community resources such as Ryan White Programs and HIV/STD Testing resources. This study examines the influence of these specific factors to answer the research question “What influences community health center HIV testing approach?”

CHAPTER 3

DATA AND METHODS

In this chapter, a detailed presentation of the research hypotheses formulated to answer the research question “What influences community health center HIV testing approach?” was given. Additionally, the four data sources used in the study and a discussion of each variable were described. Also, an explanation of the source, conceptualization, and coding of the variables was presented. The statistical procedure used and the limitations of the data and methodology were described.

This study used cross-sectional research design and logistic regression to investigate macro level predictors of community health center HIV testing approach. The unit of analysis is community health centers and the dependent variable was community health center HIV testing approach. Independent variables were provider perception of community HIV risk, existence of a community health center HIV testing policy, existence of community health center HIV testing funding, percent of the local population that is Black, percent of the local population that is Hispanic and/or Latino, percent of the local population that is living below poverty, existence of a local Ryan White provider, and existence of a local HIV and sexually transmitted disease (STD) testing resource.

Community health centers were selected as the unit of analysis because they serve vulnerable populations including those who are disproportionately affected by HIV. Additionally, community health centers are, as a requirement of their funding, tailored to fit the special needs and priorities of the communities in which they are located. This made them an appropriate unit of analysis for a study of community level and macro influences.

Research Hypotheses

This study tested the following hypotheses to answer the research question "What influences community health center HIV testing approach?"

Hypotheses 1

The higher the perceived HIV risk of patients and other community members in the service area by the majority of community health center clinical staff, the more likely the community health center is to offer routine HIV testing.

Hypothesis 2

Community health centers that have an HIV testing policy are more likely to offer routine HIV testing.

Hypothesis 3

Community health centers that have HIV specific funding are more likely to offer routine HIV testing.

Hypothesis 4

The higher the local percent of Black population, the more likely the community health center is to offer routine HIV testing.

Hypothesis 5

The higher the local percent of Hispanic and/or Latino population, the more likely the community health center is to offer routine HIV testing.

Hypothesis 6

The higher the local percent of population living below poverty, the more likely the community health center is to offer routine HIV testing.

Hypothesis 7

Community health centers that have a local Ryan White program are more likely to offer routine HIV testing.

Hypothesis 8

Community health centers that have a local HIV and STD testing resource are more likely to offer routine HIV testing.

Data Sources

Data for this study came from four quantitative secondary sources, the first three of which are from the United States, Department of Health and Human Services (HHS). The first is the Office of the Secretary (OS), Office of Inspector General (OIG), Office of Evaluation and Inspections (OEI) study HIV Testing in HRSA-funded Health Center Sites data set. This data were obtained via a Freedom of Information Act request. The second is the publically available Health Resources and Services Administration (HRSA), HIV and AIDS Bureau database of Ryan White HIV/AIDS Medical Care Providers. The third is the publically available Center for Disease Control and Prevention (CDC), National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, National HIV and STD Testing Resource database. The last source is the publically available information from the United States Census Bureau, 2010 data set. Because all the data used in this study were secondary and not specific to human subjects, the Institutional Review Board determined that no review was necessary. The data sources (detailed below) were combined and/or compiled into the study specific database based on community health center zip codes.

OEI HIV Testing in HRSA-funded Health Centers Sites Data Set

In 2010, OEI was tasked with examining the HIV testing practices of HRSA funded community health centers, the adoption of specific practices at these centers, the reported influence of federal recommendations on their policies and practices, and the factors that affected the adoption of certain practices and HIV testing in general. To do so, OEI obtained a list of 8,144 locations that were approved for HRSA Community Health Center funding in 2010. From this list, OEI randomly sampled 500 community health centers. From these 500, the OEI excluded 148 community health centers because they either did not provide primary care (e.g. only provided only dental services), or was not a community health center (e.g. applied for HRSA funding but never opened to provide services).

OEI collected data by sending electronic surveys to 352 community health centers. In order to ensure responses that were representative of the care provided in community health centers, OEI asked community health centers to designate staff or staffs who provide primary care to answer the electronic survey questions regarding HIV testing services. Despite this, OEI was unable to ensure that staff that provided primary care answered the survey and was unable to determine the position of the staff that completed the survey. Despite not knowing the position of the person or persons who completed the survey, the data remains useful as respondents represented the community health center.

The OEI collected survey responses from May through August of 2011. In the survey, OEI asked community health centers about the HIV services they provided in 2010, including the extent to which they felt their community and patient population was at risk for HIV/AIDS. Community health centers that indicated that they provided HIV testing onsite were asked additional questions about which populations they tested, their policies for HIV testing, and if they received funding specifically for HIV testing. OEI had a 92% response rate to the survey with answers from 324 of 352 community health centers (OIG, 2013b).

Thirty-three of the 352 community health centers did not offer HIV testing at all and were excluded. Ten other community health centers were excluded from the analysis due to missing data. A comparison between excluded and included centers on the variables in the analysis revealed no differences. The final sample contained a total of 281 community health centers after exclusions. See Table 1.

Table 1

Populations, Sampling Frame, and Exclusions

Description	N
Population	8,144
Sample	500
Excluded: No primary care, not a community health center	-148
OEI Dataset Sample	324
Excluded: Did not offer HIV testing	- 33
Excluded: List wise deletion due to missing data	- 10
Final data on which analysis was conducted	281

To my knowledge, no other dataset existed that was as comprehensive or representative of community health center HIV testing practices. Several researchers (Myers et al. 2009; Arya et al. 2012; Cunningham et al. 2009; Weis et al. 2009; and Johnson et al. 2011) collected data from six community health centers and their personnel but their research looked largely at specific populations, program implementation, or policies. Johnson et al. (2011) conducted qualitative interviews with personnel from 30 community health centers in Massachusetts. Data collected from these studies were not as comprehensive as that found in the representative sample of community health centers in the OEI dataset. The OEI dataset was especially useful because it contained a representative sample and findings from the study of this data may be generalizable to all HRSA funded community health centers that provided primary care in 2010.

Multiple variables used in this study came from the OEI data set: community health center HIV testing approach, provider perception of community HIV risk, existence of a community health center HIV testing policy, and existence of HIV testing funding.

HRSA Ryan White HIV/AIDS Medical Care Providers Database

The HRSA HIV and AIDS Bureau host a database of Ryan White HIV/AIDS Program Medical Care Providers. This online, publicly available database is intended to assist individuals with HIV/AIDS find medical care. It includes doctors and clinics that are specifically trained to treat HIV/AIDS and are Ryan White HIV/AIDS Program recipients. The HRSA HIV and AIDS Bureau is the funding agency for all Ryan White HIV/AIDS programs and providers and as such, its database is the most comprehensive listing of Ryan White care providers. Users can find Ryan White HIV/AIDS Program medical care providers by searching generally, using a State or County function, or can search more specifically, by address (HRSA, 2010.)

The HRSA Ryan White HIV/AIDS Medical Care Providers database was used in this study for one independent variable—whether or not a community health center has a Ryan White HIV/AIDS program provider within 5 miles of its location.

CDC National HIV and STD Testing Resource Database

The CDC National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention is the nation’s leading source of public health prevention and funding regarding HIV and STDs. It hosts the National HIV and STD Testing Resource, a publically available online database and the most comprehensive available of HIV and STD testing resources. Users can find the closest HIV or STD testing location by entering their zip code and searching within a predetermined mile radius – 10, 15, 2, 25, 30, or 35 miles. The search results indicate the services provided by each HIV and STD testing location such as free HIV tests, rapid HIV oral tests, and conventional HIV blood tests (CDC, 2010b).

The National HIV and STD Testing Resource database was used in this study for one independent variable—whether or not a community health center has a HIV/STD testing resource within 10 miles of its location.

2010 Census Dataset

The United States Department of Commerce, United States Census Bureau hosts the online and publically available 2010 Census dataset. The 2010 Census dataset includes demographic information that has been aggregated at a variety of levels such as census tract, zip code, city, county, and state (United States Department of Commerce, 2010). Because literature revealed that the external environment of the community health center may influence its HIV testing approach, this dataset was used in this study for three independent demographic variables: percent of the local population that is Black, percent of the local population that is Hispanic and/or Latino, and percent of the local population that is living below poverty. For each of these variables, local is defined at the zip code level.

Variables

Eight variables were used to investigate what macro level factors may be predictive of community health center HIV testing approach and the associated hypotheses. Table 2 contains a summary of the variable names, descriptions, sources, and coding. The dependent variable in this analysis was community health center HIV testing approach (APPROACH) and was from the OEI dataset. Community health centers may approach HIV testing in a targeted manner, specifically offering HIV tests to patients who are in high risk groups, or they may approach HIV testing in a routine manner and test all patients irrespective of their risk status. APPROACH was operationalized by coding responses to a survey question that queried which patient populations were typically tested for HIV. See Appendix question 8 for the original survey question. If a respondent answered that the community health center tested everyone (adults and teenage patients) regardless of risk, the response was labeled “routine.” Otherwise, it was labeled “targeted.” There were no “other” responses. The variable was then coded routine (1) and targeted (0).

Provider perception of community HIV risk (RISK) was an independent variable from the OEI dataset. RISK represents the extent to which the majority of clinical staff at a community health center considered patients and other community members in the service area to be at risk for HIV infection. This variable was used as an independent predictor because according to research (Stiffman et al. 1997; Stiffman et al. 2000; Stiffman et al. 2006; Stiffman et al. 2001; Steward, Koester, Myers, and Morin, 2006) provider perception of risk may influence community health center HIV testing approach. See Appendix question 3 for the original survey question.

Only 4 community health centers reported that the majority of their clinical staff considered patients and other community members in the service area to have no risk of HIV infection. As a result, a new category, “low/no risk,” was created by collapsing the category “no risk” into the category “low risk.” There were no “other” responses to this survey question. In order to model the ordinal variable, I created 2 dummy variables. The first dummy variable is “average risk” (1) with “low/no risk” (0) as the reference category. The second dummy variable is “high risk” (1) with “low/no risk” (0) as the reference category.

Existence of a health center HIV testing policy (POLICY) was another independent variable from the OEI dataset. POLICY represents whether or not the community health center has an HIV testing policy that stipulates which patients should receive an HIV test. This variable was included as an independent predictor variable because research indicates that the existence of health center policy may influence its providers (Phillips et al. 1998; Stiffman et al. 2001; Durlak and DuPre, 2008; Miller et al. 2003; Ramos and Ferreria-Pinto, 2002; Ginexi and Hilton, 2006; Rohrbach et al. 2006, and Johnson et al. 2011). See Appendix question 6 for the original survey question. The categories “yes, written”, and “yes, verbal” were collapsed into a general “yes” category because literature does not indicate that there is a substantial difference between written and verbal policies. There were no “other” responses. The variable was dummy coded as “yes, has a policy” (1) and “no, does not have a policy” (0).

Existence of community health center HIV testing funding (FUNDING) was an independent variable from the OEI dataset. FUNDING represents whether or not the community health center receives funding specifically for HIV tests. This variable was included as an independent predictor variable because the literature suggests that funding may influence HIV testing provision and approach (Johnson et al. 2011). See Appendix question 9 for the original survey question. There were no “unknown” responses. The variable was dummy coded as “yes, receives funding” (1), and “no, does not receive funding” (0).

Percent of local population that is Black (BLACK) was an independent variable from the 2010 Census dataset. BLACK represents the percentage of the population in the area local to a community health center community which identifies as Black or African American (Hispanic or non-Hispanic). The area local to the community health center was defined by zip code. BLACK was included as an independent predictor variable because literature indicates that the percent of a community that identifies as Black may influence community health center HIV testing provision and approach (Taylor et al. 2006). This variable was an interval ratio variable and was expressed as a percent.

Percent of local population that is Hispanic and/or Latino (HISPANIC/LATINO) was another independent variable from the 2010 Census dataset. HISPANIC/LATINO represents the percentage of the population around the community health center that identifies as Hispanic and/or Latino. It was defined by zip code area. HISPANIC/LATINO was included as an independent predictor variable because literature indicated that the percent of a community that identifies as Hispanic and/or Latino may influence community health center HIV testing provision and approach (Kaiser Family Foundation, 2011). This variable was an interval ratio variable and was expressed as a percent.

Percent of the local population living below poverty (POVERTY) was another independent variable from the 2010 Census dataset. POVERTY represents the percentage of the population in the area in which the community health center community is located, that live below the federal poverty level. The local area was defined by zip code. POVERTY was included as an independent variable because the literature suggests that the percent of the population living below poverty may influence community health center HIV testing provision and approach (Singh Setia et al. 2009). This was an interval ratio variable and was expressed as a percent.

Table 2

Dependent and Independent Variables

Variable Name	Description	Data Source*	Measure
Approach	Community Health Center HIV Testing Approach	OEI	1 = Routine 0 = Targeted
Risk	Provider Perception of Community HIV Risk	OEI	
Average Risk			1 = Average 0 = Low/No
High Risk			1 = High 0 = Low/No
Policy	Existence of a Community Health Center HIV Testing Policy	OEI	1 = Yes 0 = No
Funding	Existence of Community Health Center HIV Testing Funding	OEI	1 = Yes 0 = No
Black	Percent of Local Population that is Black	Census	0 – 100%
Hispanic/Latino	Percent of Local Population that is Hispanic and/or Latino	Census	0 – 100%
Poverty	Percent of the Local Population Living Below Poverty	Census	0 – 100%
Ryan White	Existence of a Local Ryan White Provider	HRSA	1 = Yes 0 = No
Resource	Existence of a Local HIV/STD Testing Resource	CDC	1 = Yes 0 = No

*OEI = OEI HIV Testing in HRSA-funded Health Centers Sites Data Set
Census = 2010 Census Data Set
HRSA = HRSA Ryan White HIV/AIDS Medical Care Providers Database
CDC = CDC National HIV and STD Testing Resource Database

Zip code data used for BLACK, HISPANIC/LATINO, and POVERTY were compared to census tract data to determine if there was a statistically significant difference between the two, and if that by looking only at zip code level data, the nuance that occurs at the census tract level might be lost. To make this determination, 29 community health centers (10 percent of the sample prior to list wise deletion) were geocoded to their respective census tract level. BLACK, HISPANIC/LATINO, and POVERTY were then compared at the census tract level and the zip code level using a paired *t*-test on each. There was no statistically significant difference on any of the three variables suggesting that the use of either zip code level data or census tract level data would be acceptable. However, because zip code data were available for the entire sample of community health centers in the OEI data set, analysis was conducted using zip code level data. See Tables 3 for results of this analysis.

Table 3

T Test of Statistical Significance between Zip Code and Census Tract Level (N = 29)

Variable	*t*	*df*	*p*
Black	-0.53	28	0.5986
Hispanic/Latino	-1.38	28	0.1780
Poverty	-0.32	28	0.7526

* Statistically significant at .05 level.

Existence of a local Ryan White provider (RYAN WHITE) was an independent variable from the Ryan White HIV/AIDS Medical Care Providers database. RYAN WHITE represents whether or not a community health center has a Ryan White

HIV/AIDS medical care provider within 5 miles of its location. RYAN WHITE was included as an independent predictor variable because research indicates that community resources, such as Ryan White programs, provide more opportunities for utilization and that providers offer patients more services when they are familiar with, connected to, and knowledgeable about the existence of resources and other providers in the local area (Bunger et al. 2010; Striley et al. 2003).

A list of Ryan White HIV/AIDS medical providers was generated by entering the addresses of each community health center in the search engine of the Ryan White website. This resulted in a list of Ryan White HIV/AIDS medical care providers listed in order of their distance from the community health center. Recorded into the study specific database was whether or not there was a Ryan White provider within 5 miles of the community health center. RYAN WHITE was dummy coded as “yes, there is a Ryan White provider within 5 miles,” (1) and, “no, there is not a Ryan White provider within 5 miles” (0).

Existence of a local HIV/STD testing resource (RESOURCE) was an independent variable from the CDC, National HIV and STD Testing Resource database. RESOURCE represents whether or not a community health center has an HIV/STD testing resource within 10 miles of its location. RESOURCE was included as an independent predictor variable because research indicates that the presence of local HIV/STD testing resources provide patients with more opportunities for utilization. Moreover, providers offer patients more services when they are familiar with, connected to, and knowledgeable about the existence of resources and other providers in the local area (Bunger et al. 2010; Striley et al. 2003).

To generate a list of HIV/STD testing resources specific to each community health center, the address of each center was entered into the National HIV and STD Testing Resource database. This resulted in a list of HIV/STD testing resources within a 10 mile radius of each community health center. Recorded into the study specific database was whether or not there was an HIV/STD testing resources within 10 miles of the community health center. RESOURCE was dummy coded as “yes, there is an HIV/STD testing resource within 10 miles” (1), and “no, there is not an HIV/STD testing resource within 10 miles” (0).

Statistical Procedures

Logistic regression was used to answer the research question and to examine the associated hypotheses. Logistic regression is an appropriate statistical tool for use with dichotomous dependent variables (Huck, 2000; Allison, 1999; George and Mallery, 2000; Allison, 2012; Long, 1997; Menard, 1995). It is also appropriate when data include both continuous and categorical independent predictor variables. Analysis was conducted using the Statistical Analysis System (SAS).

Logistic Regression and Independent Predictor Variables

Logistic regression identifies the effect an independent variable (also called a predictor or explanatory variable) has on the dependent variable, when controlling for other independent variables. However, unlike linear regression, logistic regression does so through a change in the log-odds of the dependent variable rather than changes in the dependent variable (Huck, 2000). The log-odds indicate how much more likely it is that an observation is a member of the target group (routine testing in this case) rather than the other group (targeted testing).

The log-odds range from -∞ to +∞. Logistic regression also gives us a test statistic, the Wald statistic and its associated significance value that allows us to determine if there is evidence that a log-odds is different from 0 or that the odds is different from 1 in the population. For example, a log-odds of 0.33, a Wald statistic of 3.11, and a $p < 0.001$ tells us that there is evidence that the log-odds is different from 0 (or the odds is different from 1) in the population.

However, in logistic regression, the unit changes in the dependent variable are not equal from one observation to another so the odds ratio is computed for uniform interpretation. The odds ratio (OR), the main statistic interpreted in logistic regression, estimates the change in the odds of membership in the target group (routine testing) for a one-unit increase in a predictor (an independent variable). An OR of greater than 1 means that the odds of an event occurring (i.e. a community health center using routine HIV testing approach) are increased, an OR of 1 means the odds are equal, and an OR of less than 1 means that the odds are decreased. In this way, logistic regression allows me to determine the extent to which variables are predictors of a certain outcome.

For the dichotomous independent variables used in this study, it can be stated that the odds that $Y = 1$ for $X = 1$ is OR times the odds that $Y = 1$ for $X = 0$ after accounting for the other independent variables. For interval-ratio independent variables in this study, it can be said that for every one-unit increase in X, the odds that $Y = 1$ changes by OR times after accounting for the other independent variables. Further, converting and interpreting the percentage change in the OR for both dichotomous and interval-ratio independent variables by using the following formula: $\%\Delta = (OR - 1) * 100$ adds to ease of interpretation.

Logistic Regression Model Fit and Predictive Power

Often, the purpose of using logistic regression is not only to determine if variables are predictors of an outcome, but also to determine how well a model (that includes many independent predictor variables) fits. The analysis gives three chi-square statistics that test if all explanatory variables have coefficients of 0. The degrees of freedom (in this analysis, 9) for each statistic correspond to the coefficients for the independent variables. The first chi-square statistic is the Likelihood Ratio, the second is the Score, and the third is the Wald statistic, each calculated differently but usually all very close in value. If the associated *p*-values are around 0.05, it can be concluded that at least one of the coefficients in the model is not 0, meaning that at least one independent variable affects the dependent variable.

Additionally, there are several statistics that indicate how well the model fits the data or if the model could be improved by adding non-linearities and interaction variables. One such statistic is the Homer-Lemeshow (HL) statistic, used to determine if the fitted model cannot be rejected (Homer and Lemeshow, 2000). Another is the Deviance statistic that contrasts the fitted model with one that is known as the saturated model. This statistic has a parameter for each profile rather than for each case. Another statistic is the Pearson chi-square, which is just one more way to test if the model cannot be improved upon.

In addition to statistics that indicate how well the model fits the data, certain statistics indicate the predictive power of the model. For example, R^2 is a coefficient of determination that is based on the likelihood ratio chi-square for testing the null hypothesis that all the coefficients are zero.

Logistic regression requires variables not be highly correlated. Multicollinearity was checked and is not a concern. To determine if the independent variables are independent from each other, correlations larger than 0.60 that were statistically significant (Allison, 1999) were sought. There are statistically significant linear relationships between independent variables, but none of the correlations are strong enough to cause concern for multicollinearity. Additionally, the Variance Inflation Factor (VIF) was checked. The VIF quantifies the severity of multicollinearity. Low VIF tolerance scores correspond to high multicollinearity and according to Allison (2012), a tolerance below 0.40 should cause concern. There were no tolerance scores below 0.40 as shown in Table 4 below.

Table 4

Variance Inflation Factors Tolerance Scores (N = 281)

Variable	*t*	*p*	Tolerance	Variance Inflation
Risk	2.83	0.0051	0.80	1.25
Policy	-2.56	0.0110	0.86	1.16
Funding	-3.05	0.0025	0.86	1.17
Black	-0.46	0.6481	0.64	1.57
Hispanic/Latino	0.21	0.8353	0.77	1.29
Poverty	0.12	0.9019	0.70	1.42
Ryan White	-0.46	0.6438	0.70	1.43
Resource	0.52	0.6041	0.80	1.25

Additionally, logistic regression requires a large sample size—between 10 and 30 cases per independent variable (Allison, 2012; Fox, 1997; Tabachnick and Fidell, 1996). This analysis uses 8 independent variables that would ideally require between 90 and 270 observations. This analysis is conducted on 281 observations thereby meeting the large sample size requirement.

Limitations

The findings presented in this research must be interpreted with the acknowledgment of several limitations.

The first limitation is that all data sources used in this research were secondary data sources. Use of secondary data sources typically involves limitations such as old data, incomplete data, consistency, and reliability issues. Indeed, the methods of collection and quality of data collection for the data sources used in this research are not possible to validate. While information regarding who collected the data and why the data were collected were provided, for some data sources, it was not possible to provide information about how the data were collected. Additionally, using secondary data limits the validity of analysis. This analysis is limited to only the data included in the secondary data sources which are logically reasoned to represent the variables and concepts on which the study is based. Using secondary data also limits the reliability of this analysis in that data sources are assumed to accurately report what they claim to report. Further, using secondary data constrains this analysis to how the data were collected by another person or organization. This is particularly relevant for the 33 community health centers that were excluded because they did not offer HIV testing and as such, were not asked survey questions relevant to the variables included in the analysis. The findings of this analysis may have been different had those 33 community health centers been asked the relevant survey questions and included in the analysis.

Using self-reported data is the second limitation of this research. The OEI dataset consisted of self-reported answers to an electronic survey and it is impossible to provide an estimate on the accuracy of this data. Self-reported data may be skewed by social desirability and self-observation errors and recall bias – OEI collected data from May through August of 2011, but asked community health centers about the HIV services they provided in the prior year, 2010. Additionally, the ways in which the survey questions were worded may have influenced responses. For example, questions in the survey may have been loaded, leading, or double-barreled, or may have used jargon that was confusing or misleading to respondents. Further, OEI had a 92% response rate to the survey it administered to health centers, which is generally considered a very good response rate (Babbie, 2007), however the data were limited in that OEI was unable to ensure that staff that provided primary care answered the survey and was unable to determine the position of the staff that completed the survey.

A third limitation of this research is the cross-sectional research design. The phenomena which was examined in this research is HIV testing in health centers at the point in time at which the data were collected, 2011, but is based on services provided in 2010. Findings from this research do not apply to any other timeframe and should not be generalized to HIV testing in health centers outside of this timeframe. Findings from a different timeframe may differ.

Using data at the zip code level rather than a smaller geographic unit such as census tract or block is a fourth limitation of this research. Zip codes can be large areas in which many different populations reside. There may be multiple pockets of racial and ethnic groups as well as pockets of poverty within one zip code. However, when a zip code is examined as a whole, these pockets may be overlooked. The nuances and importance of the presence of vulnerable populations and any variable that is related to geography, such as Ryan White clinics and HIV and STD testing clinics within a certain number of miles, may be lost. Findings of this analysis may have been different had data been collected and analyzed at a smaller geographic unit other than zip codes such as block level.

A fifth limitation of this research is that it was outside the scope of this study to gauge the outcomes of community health center HIV testing approach. That is, the data did not contain the number of patients that were actually tested routinely or the number of patients that were tested through targeted means. Instead, the data were limited to community health center self-reported data regarding the patients they typically test for HIV.

CHAPTER 4

FINDINGS

This chapter provides the results of the analysis conducted to answer the research question “What influences community health center HIV testing approach?” First, the characteristics of the community health centers in the dataset were described. Second, the findings that resulted from the statistical procedure, logistic regression were presented. Third, a discussion regarding how well the proposed model fit the data was presented.

Community Health Center Characteristics

Community health centers in this study were, on average, located in communities in which at least one-fifth of the population belong to groups known to be vulnerable to HIV (19 percent Black or African American, 21 percent Hispanics and/or Latinos, and 23 percent persons living below poverty). See Figure 6 to compare the sample community health center service population to the general United States population.

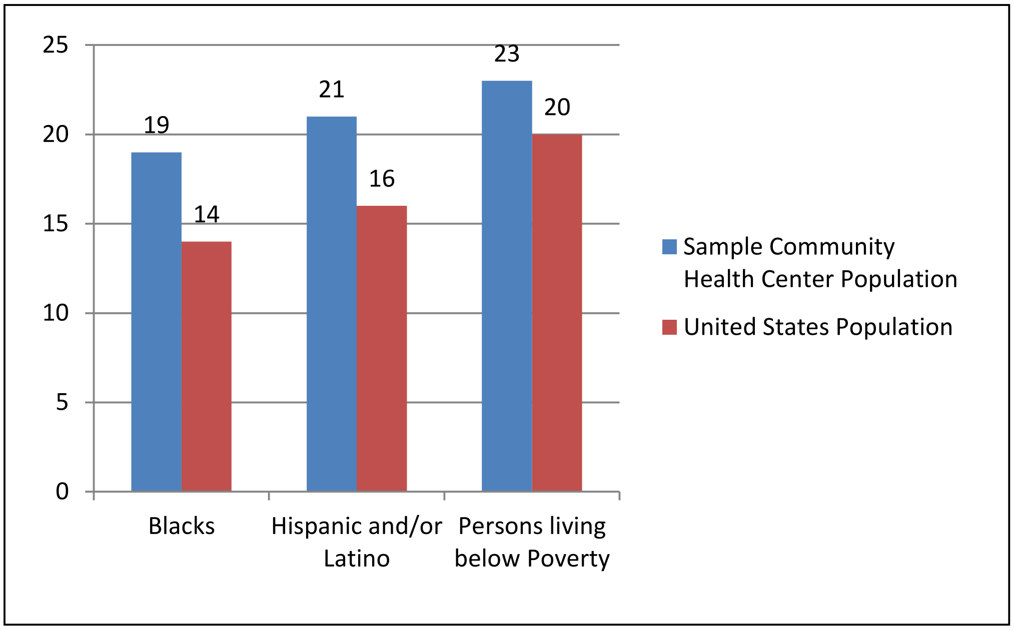


Figure 6. Sample of community health center service populations compared to general United States population.

Despite vulnerable populations being over represented in the community health centers service population, more clinical staff at these community health centers considered the patients and other community members in the service areas to be at low or no risk for HIV infection (30 percent) or average risk (45 percent) than high risk for HIV infection (25 percent).   See Figure 7.

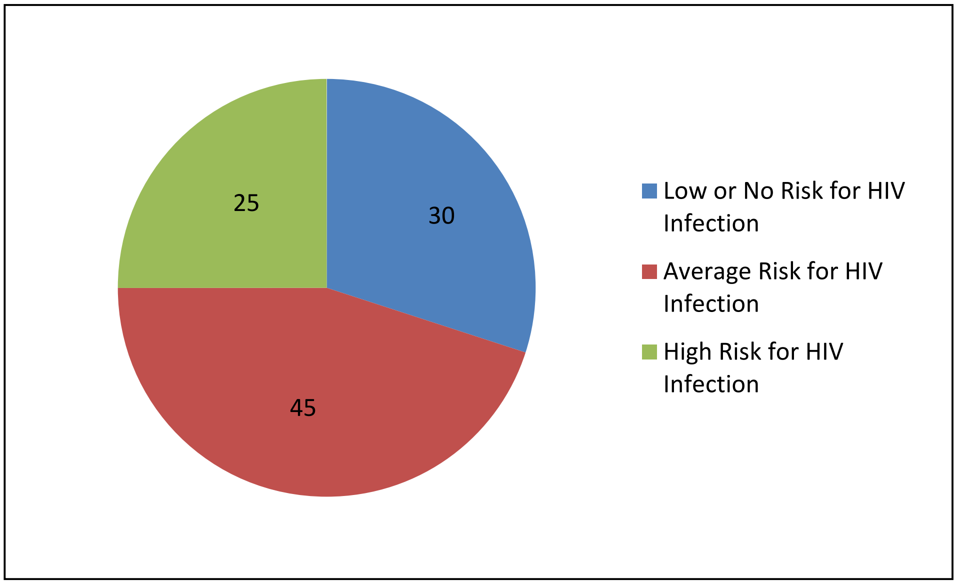


Figure 7. Community health center perception of their patients and other community member's HIV risk.

Additionally, less than one quarter, 21 percent, of community health centers reported routinely offering HIV testing to all patients. Further, despite the local composition of known vulnerable populations, less than half of community health centers in this study, 44 percent, reported that their center had a policy regarding who should receive an HIV test and barely over half, 52 percent, of community health centers in this study reported receiving funding specifically for HIV testing in 2010. Perhaps community health centers in this study relied on other providers to service the vulnerable populations in their community with regards to HIV; 45 percent of community health centers had a Ryan White provider within 5 miles and 86 percent had an HIV and sexually transmitted disease (STD) testing site within 10 miles. See Table 5.

Table 5

Characteristics of Community Health Centers (N = 281)

Variable	Mean	Standard Error	Percent
Approach			
Routine			21.0
Targeted			79.0
Risk			
High			24.6
Average			45.2
Low/No			30.3
Policy			
Yes			43.8
No			56.3
Funding			
Yes			51.9
No			48.0
Black	19.3	23.8	
Hispanic/Latino	21.3	24.8	
Poverty	22.8	12.0	
Ryan White			
Yes			45.2
No			54.8
Resource			
Yes			86.12
No			13.88

Findings

The hypothesis statements and subsequent tests for each independent predictor variable in the model follow. See Table 6 for results of the logistic regression.

Hypotheses 1

The higher the perceived HIV risk of patients and other community members in the service area by the majority of community health center clinical staff, the more likely the community health center is to offer routine HIV testing.

Results of logistic regression analysis rejected the null hypothesis for both of the two dummy variables created to model the ordinal variable RISK. The first dummy variable that compared “Average Risk” to “Low/No Risk” was statistically significant ($p = 0.0095$) at the .05 level and the null hypothesis is rejected. The odds ratio (OR) for “Average Risk” when compared to “Low/No Risk” was 3.676. That is, all else equal, the odds of offering routine HIV testing for community health centers that perceived their patients and community to be at average risk for HIV were 3.676 times the odds for those centers that perceived their patients and community to be at low or no risk for HIV.

The second dummy variable that compared “High Risk to “Low/No Risk” was statistically significant ($p = 0.0043$) at the .05 level and the null hypothesis is rejected. The OR for “High Risk” when compared to “Low/No Risk” was 4.693. That is, all else equal, the odds of offering routine HIV testing for community health centers that perceived their patients and community to be at high risk for HIV were 4.693 times the odds for those centers that perceived the community to be at low or no HIV risk.

Hypothesis 2

Community health centers that have an HIV testing policy are more likely to offer routine HIV testing.

The test statistic for this hypothesis was statistically significant (p = .0196) at the .05 level and the null hypotheses for this variable was rejected. The OR for Community Health Center HIV Policy was 2.202. That is, all else equal, the odds of offering routine HIV testing for community health centers in which an HIV testing policy exists were 2.202 times the odds for those centers in which an HIV testing policy does not exist.

Hypothesis 3

Community health centers that have HIV specific funding are more likely to offer routine HIV testing.

The test statistic for this hypothesis was statistically significant (p = .0027) at the .05 level and the null hypotheses for this variable was rejected. The OR for Community Health Center HIV Specific Funding was 2.938. That is, all else equal, the odds of offering routine HIV testing for community health centers that received funding specifically for HIV testing were 2.938 times the odds for those centers that did not receive such funding.

Table 6

Logistic Regression Effects of Individual Predictor Variables on Community Health Center HIV Testing Approach (N = 281)

							95 % CI	
Predictors	B	S.E.	Wald	*df*	p	OR	Lower	Upper
Average Risk (Low/No)	**1.3018**	**0.5017**	**6.7322**	**1**	**0.0095**	**3.676**	**1.375**	**9.827**
High Risk (Low/No)	**1.5460**	**0.5415**	**8.1508**	**1**	**0.0043**	**4.693**	**1.624**	**13.563**
Policy (No)	**0.7892**	**0.3382**	**5.4455**	**1**	**0.0196**	**2.202**	**1.135**	**4.272**
Funding (No)	**1.0778**	**0.3596**	**8.9854**	**1**	**0.0027**	**2.938**	**1.452**	**5.945**
Black	-0.0028	0.0084	0.1120	1	0.7379	0.997	0.981	1.014
Hispanic/Latino	0.0020	0.0072	0.0789	1	0.7788	1.002	0.988	1.016
Poverty	0.0032	0.0164	0.0380	1	0.8455	1.003	0.971	1.036
Ryan White (No)	0.2530	0.3682	0.4721	1	0.4920	1.288	0.626	2.650
Resource (No)	-0.3604	0.6466	0.3107	1	0.5772	0.697	0.196	2.476
Constant	-3.3795	0.6926	23.8097	1	<0.0001	n/a	n/a	n/a

Likelihood Ratio X^2 = 40.0556, 9df, p<.0001	Homer Lemeshow X^2 = 4.5499, 8df, p = 0.8044	R^2 = 0.1329
Score statistic X^2 = 36.1539, 9df, p<.0001	Deviance statistic X^2 = 245.9889, 266df, p = 0.8055	Sensitivity = 0.0
Wald statistic X^2 = 30.6338, 9df, p =.0003	Pearson chi-square statistic X^2 = 277.6300, 266df, p = 0.2995	Specificity = 95.0

Bold font indicates the variable is statistically significant at .05 level. Reference categories have been noted in parentheses. B = unstandardized logistic regression coefficient

Hypothesis 4

The higher the local percent of Black population, the more likely the community health center is to offer routine HIV testing.

The test statistic for this hypothesis was not statistically significant (p = .7379) at the .05 level and the null hypothesis for this variable was not rejected.

Hypothesis 5

The higher the local percent of Hispanic and/or Latino population, the more likely the community health center is to offer routine HIV testing.

The test statistic for this hypothesis was not statistically significant (p=.7788) at the .05 level and the null hypothesis for this variable was not rejected.

Hypothesis 6

The higher the local percent of population living below poverty, the more likely the community health center is to offer routine HIV testing.

The test statistic for this hypothesis was not statistically significant (p = .8455) at the .05 level and the null hypothesis for this variable was not rejected.

Hypothesis 7

Community health centers that have a local Ryan White program are more likely to offer routine HIV testing.

The test statistic for this hypothesis was not statistically significant (p = .4920) at the .05 level and the null hypothesis for this variable was not rejected.

Hypothesis 8

Community health center that have a local HIV and STD testing resource are more likely to offer routine HIV testing.

The test statistic for this hypothesis was not statistically significant ($p = .5772$) at the .05 level and the null hypothesis for this variable was not rejected.

Overall Model Fit

It appeared that the logistic regression model fit the data well. The results of the Likelihood Ratio ($X^2 = 40.0556$, 9df, $p<.0001$), the Score statistic ($X^2 = 36.1539$, 9df, $p<.0001$), and the Wald statistic ($X^2 = 30.6338$, 9df, $p = 0.0003$) indicated that at least one of the predictor variables was related to the log odds of community health center HIV testing approach at at least the .0001 level of statistical significance. None of the three statistics that indicated how well the model fit the data or if it could be improved by adding non-linearities and interactions were statistically significant, indicating that the fitted model cannot be rejected and led to the conclusion that the model fit well. Additionally, the Homer Lemeshow statistic for this model was not statistically significant ($p = 0.8044$) at the .05 level ($X^2 = 4.5499$, 8*df*). The Deviance statistic for this model was not statistically significant ($p = 0.8055$) at the .05 level ($X^2 = 245.9889$, 266*df*). The Pearson chi-square statistic was not statistically significant ($p = 0.2995$) at the .05 level ($X^2 = 277.6300$, 266*df*). A high p-value, as in the Homer Lemeshow and the Deviance statistic, indicated that the fitted model cannot be rejected.

However, despite a good model fit, the model appeared to have somewhat low predictive power ($R^2 = 0.1329$). Unlike the R^2 for a linear model, this R^2 could not be interpreted as the proportion of variance explained by the independent variables, but it did show how well the dependent variable could be predicted based on the values of the independent variables. Overall, it appeared that employing the gateway provider model was not in vain. The logistic regression model used fit the data well and it was found that three individual predictor variables were related to health center HIV testing approach indicating that there is merit in the idea that macro level factors influence community health center HIV testing approach. However, given the somewhat low predictive power, unlike previous research (Stiffman et al. 2001) using the gateway provider perspective did not explain a great deal about community health center HIV testing provision, specifically their HIV testing approach.

CHAPTER 5

DISCUSSION

This chapter provides an interpretation and discussion of the study findings. Also, it connects the study findings to the previously reviewed literature, explaining where previous literature findings were confirmed, or where the study findings differed from previous literature findings. Additionally, it discusses the theoretical framework employed in this research, the gateway provider model. Where applicable, it provides the limitations of the gateway provider model. It explains how the use of the gateway provider model was useful in understanding community health center HIV testing approach, or, alternatively, it offers possible reasons why the gateway provider model was not helpful in understanding what factors influence community health center HIV testing approach.

Interpretation of Findings

This study contributed to the understanding of HIV testing in a way not examined before by asking the research question “What influences community health center HIV testing approach?” The gateway provider model was employed and it found that a community health center’s perception of community HIV risk was related to its HIV testing approach. Additionally, it found that existence of a HIV testing policy and HIV test related funding was related to community health center HIV testing approach. It did not find that any other variables tested were related to community health center HIV testing approach.

Need: Provider Perception of Community HIV Risk

This study found that all else equal, the odds of offering routine HIV testing for community health centers that perceived their patients and community to be at average risk for HIV were 3.676 times the odds for those centers that perceived their patients and community to be at low or no risk for HIV. This finding confirmed previous research findings that provider's perception of need, (conceptualized in this study as perception of community HIV risk), influenced their service provision (Stiffman et al. 1997; Stiffman et al. 2000; Stiffman et al. 2006). The higher the perceived HIV risk of patients and community members, the more likely the community health center was to offer routine HIV testing. Specifically, providers in 45 percent of community health centers in the study considered their patients and community members to be at average risk for HIV infection and were more likely to offer routine HIV testing than those in the 30 percent of community health centers in which providers considered their patients and community members to be at low risk for HIV infection.

Further, the odds of offering routine HIV testing for community health centers that perceived their patients and community to be at high risk for HIV were 4.693 times the odds for those centers that perceived the community to be at low or no HIV risk. These figures illustrated that the higher the perceived risk, the more likely the community health center was to offer routine HIV testing. This is particularly important because research showed that that patients are more likely to accept a routinely offered test when a doctor recommends it (Doshi et al. 2013; Kaiser Family Foundation, 2011; Johnson et al. 2009; Mimiaga et al. 2007; the Centers for Disease Control and

Prevention [CDC], 2006b; Bond et al, 2005; CDC, 2005; MacKellar et al. 2005; Fernandez et al. 2000; Harris et al. 2004; Fernandez et al. 2003).

These findings show that the gateway provider model was useful in understanding what influenced community health center's HIV testing approach. The gateway provider model pulls from network-episode model which is based on the idea that providers are influenced by a multitude of factors, such as the surrounding community, when they provide care. The gateway provider model also pulls from decision theory the idea that these providers make decisions about the care they provide to patients on a rational basis. These ideas, combined in the gateway provider model, are confirmed through these findings. Specifically, gateway providers were influenced by the community, their perception of the patients and community HIV risk, and made decisions, which were assumed to be rationally based, to routinely test patients for HIV when they perceived those patients and the community HIV risk was greater.

Still, providers in 30 percent of the community health centers in the study considered their patients and community members to be at low or no risk for HIV infection. While this may be rationally based, as decision theory – a basis for the gateway provider model - would posit, Stiffman's research found that a providers' perception of need may often be inaccurate. Stiffman went further to note that even when inaccurate, provider perception may still be the most important determinant of service provision (Stiffman et al. 2001). Other research found providers did not perceive a community to have a high prevalence of disease and so did not initiate HIV testing, even with patients at sexually transmitted disease (STD) clinics (Tucker et al.

2012). Research shows that the populations served in community health centers are disproportionately affected by HIV/AIDS, so inaccurate assessment of community HIV risk is alarming, and could have detrimental effects, especially for the 30 percent of community health centers in this study in which clinical staff considered the patients and other community members in the service areas to be at low or no risk for HIV infection. Additionally, testing on the basis of risk, real or perceived, goes against the core ideas behind routine HIV testing as recommended by the CDC.

These findings regarding provider perception of risk illustrated how important the role of the health care provider is. The role of the health care provider is specifically important with regards to HIV testing, in which there is hesitancy on the part of the patient to request an HIV test. These findings also illustrated how influential surroundings or communities are to daily decisions, specifically to the decisions a community health center makes regarding HIV testing of its patients. Additionally, the findings show that the gateway provider model was useful in understanding community health center HIV testing approach– that is, that the patient's community impacts a provider's treatment decision (Stiffman et al. 2004).

However, knowing this, that the extent to which the majority of clinical staff at a community health center considered patients and other community members in the service area to be at risk for HIV infection is so influential, questions are then raised regarding the accuracy of the community health center's perception of risk, especially in those centers who believe their patients to be at low or no risk for HIV. The gateway provider model did not allow for the testing of perception accuracy. That is, using the model, community health center perception was determined to matter, a great deal in fact, but the dataset used did not allow me to test for accuracy of this perception.

Testing routinely would eliminate the gravity of risk perception because everyone, regardless of risk, would receive an HIV test. However, routine HIV testing takes time and resources such as money and that not all community health centers are able to routinely HIV test. Given this knowledge, and that previous research (Tucker et al. 2012) found that healthcare providers don’t even perceive patients at STD clinics to be at risk, misperception of risk by healthcare providers may be an area on which to target HIV education.

Structural Characteristics: Healthcare System Variables such as Policies and Funding

This study also found that all else equal, the odds of offering routine HIV testing for community health centers in which an HIV testing policy exists were 2.202 times the odds for those centers in which an HIV testing policy does not exist. This finding confirmed previous research that existence of a policy influences HIV testing provision (Stiffman et al. 2001; Johnson et al. 2011; Durlak and DuPre, 2008; Miller et al. 2003; Ramos and Ferreira-Pinto, 2002; Ginexi and Hilton, 2006; Rohrbach et al. 2006). Johnson et al. (2011) reported community health center personnel felt organizational support and buy-in was needed to facilitate routine HIV testing in their community health centers and reported that this buy-in could come in many forms, including a community health center wide routine HIV testing policy.

This finding supports the gateway provider model and shows that the model was useful in understanding what influences community health center’s HIV testing approach. The gateway provider model pulls from network-episode model the idea that providers are influenced by a multitude of factors, such as the healthcare system in which they provide care. The gateway provider model also pulls from decision theory the idea that these providers make decisions about the care they provide to patients on a rational basis. These ideas, combined in the gateway provider model, were confirmed through this finding regarding HIV testing policy. Gateway providers were influenced by the healthcare system in which they provide care, specifically by the existence of an HIV testing policy. These providers made HIV testing decisions, which were assumed to be rationally based, and were more likely to routinely test patients for HIV when they knew such a policy existed.

Knowing that the existence of an HIV testing policy is so influential, questions are then raised regarding *if* and *how* the HIV testing policy was implemented. Research shows that implementing an HIV testing policy tends to change HIV testing trends and behaviors (Byamugisha et al. 2010; Myers et al. 2009; Bergenstro and Sherr, 2010; Chandisarewa et al. 2007; Greenwald et al. 2006). Implementation, according to research, is the most important feature influencing outcomes (Wilson, 2003; Derzon, Sale, Springer, and Brounstein, 2005, Durlak and DuPre, 2008; Greenhalgh, Robert, Macfarlane, Bate, Kyriakidou, and Peacock, 2005; Fixen, Naoom, Blasé, Friedman, and Wallace, 2005; Stith, Pruitt, Dees, Fronce, Green, and Som, 2006). For example, in a meta-analysis of 59 studies that examined implementation of a variety of policies and programs, Durlak and DuPre found that in 45 of these studies (76 percent), there was a significant positive relationship between the level of implementation and half of all outcomes.

However, the variable used in this study, existence of a community health center HIV testing policy, unfortunately did not include the extent to which such a policy was implemented. Additionally, the gateway provider model did not allow for assessing the extent to which HIV testing policies were implemented. That is, using the model, community health center HIV testing policy matters, but it was impossible to determine whether or not the community health center's HIV testing policy was implemented fully and accurately. Future research should consider examining implementation of HIV testing policies by using provider self-reported data or observational data. Both provider self-reported data and observation data are established methods of gauging implementation (Durlak and DuPre, 2008). Additionally, because implementation has been shown to predict outcomes, future research should consider what factors influence implementation. For example, much as in this study, community level factors including funding and policy and provider characteristics including need perception, may influence implementation (Durlak and DuPre, 2008; Greenhalgh et al. 2005; Fixen et al. 2006; Stith et al. 2006).

Additionally, the variable existence of a community health center HIV testing policy did not include information regarding the content of the policy itself. That is, using the data available, it was not possible to assess whether or not the HIV testing policy dictates targeted or routine testing. Similar to the limitations regarding implementation of an HIV policy, the variable used in this study, existence of a community health center HIV testing policy, unfortunately did not include the content of the HIV testing policy. Additionally, the gateway provider model did not allow me to assess the content of the HIV testing policies. That is, using the model, we saw that community health center HIV testing policies matter, but it was not possible to determine if the content of the community health center's HIV testing policy dictated routine, targeted, or a mixed HIV testing approach. Future research could build upon the finding that community health centers in which HIV testing policies exist are much more likely to offer HIV testing routinely than are community health centers in which an HIV testing policy does not exist by examining the content of such policies. For example, future research might conduct a qualitative document analysis to examine the extent to which and how HIV testing policies, when they exist, address routine HIV testing.

Despite not being able to assess the implementation or the content of HIV testing policies, the existence of a policy may indicate a heightened awareness of HIV and of the need for HIV testing. That is, the community health center is aware of the need or the lack of need, for HIV testing in their community and patient population and has taken steps to formalize their HIV testing approach in a stated policy.

This finding regarding whether or not the community health center has an HIV testing policy that stipulates which patients should receive an HIV test illustrated how important the role of the community health center is, specifically with regards to HIV testing in which there is hesitancy on the part of the patient to request an HIV test. Additionally, this finding supported one of the premises behind the gateway provider model –the climate of healthcare settings impact a provider’s treatment decision (Stiffman et al. 2004). Stiffman and colleagues argued that gateway healthcare provider perceptions, knowledge, and subsequent decisions are influenced by the structural characteristics of their work environment including the “policies, resources, organization, and financial arrangements influencing the accessibility, availability, and acceptability of medical care services” (Phillips et al.,1998, p.574) and our findings supported this claim and the gateway provider model, showing that the model was useful in understanding community health center HIV testing approach.

This study also found that all else equal, the odds of offering routine HIV testing for community health centers that received funding specifically for HIV testing were 2.938 times the odds for those centers that did not receive such funding. This finding confirmed previous research that found that HIV testing often depends upon funding and whether or not a facility allocates resources to providing HIV tests, buying HIV tests, or prioritizing HIV tests over other laboratory services (Burke et al. 2007; Greenwald et al. 2006; Prost et al. 2007). Limited funding is often cited as a barrier to routine HIV testing (Kelly et al. 2006). Over half (52 percent), of community health centers in this study reported receiving funding specifically for HIV testing in 2010. Previous research discussed above found that even though community health centers reported making HIV testing available through a dedicated funding program, personnel still expressed concerns about routine HIV testing demands on resources including reimbursement for the cost of the test and the personnel resources to administer the test (Johnson et al. 2011).

This finding regarding whether or not the community health center has HIV testing specific funding illustrated, much as the finding regarding policy did, how important the role of the health care provider is. Additionally, this finding supports the premise behind the gateway provider model. The idea, pulled from network-episode model, that the healthcare system in which providers practice impact their treatment decision (Stiffman et al. 2004), and the idea pulled from decision theory, that these providers make decisions about the care they provide to patients on a rational basis are combined in the gateway provider model, and were confirmed through this finding regarding HIV testing funding. Specifically, gateway providers were influenced by the healthcare system in which they provide care. The providers were influenced by the existence of an HIV testing funding, and made HIV testing decisions, which were assumed to be rationally based, and were more likely to routinely test patients for HIV when such funding existed.

Predisposing Factors: External Environment Variables such as Vulnerable Populations

This study did not find that predisposing factors - external environment, conceptualized as percent of the local population that is Black, Hispanic and/or Latino, or living below poverty influenced a community health center's HIV testing approach. It was surprising that the higher the percent of the local population that is Black, Hispanic and/or Latino, or living below poverty did not influence a community health center to offer routine HIV testing for several reasons. First, Blacks are the group most affected by HIV in the United States (CDC, 2011c) with a prevalence rates of 1.7, comprise 44 percent of all new HIV infections (CDC, 2011c), and are much more likely than whites to present for HIV testing late in their course of infection (CDC, 2003). Second, the lifetime risk for HIV among Hispanics and/or Latinos is nearly three times the risk for whites (CDC, 2011a); this population has a prevalence rate of 0.6, and faces unique healthcare barriers such as immigration fears and language challenges. Third, nearly all community health center patients are living in poverty - 71 percent of community health center patients live at the federal poverty line or below (National Association of Community Health Centers [NACHC], 2012; Health Resources and Services Administration [HRSA], 2011a). Community health centers are mandated as part of their funding to provide services that reflect the needs of their community and service population, especially services that are culturally and linguistically appropriate. So, it is again alarming that an increased presence of a disproportionately affected population was not an influential factor on community health center HIV testing approach.

Given our theoretical model, it is surprising that predisposing factors, such as patient demographics, did not significantly influence community health centers HIV testing approach. However, given that the populations for whom I tested influence (Blacks, Hispanics and/or Latinos, and persons living in poverty), were overly represented among community health center patients, the lack of significant correlation or influence could be explained by the fact that community health centers may be accustomed to the presence of these vulnerable populations in their health centers to the extent they do not factor their presence in to the decision, even unknowingly, to routine HIV test. That is, community health centers are accustomed to serving these demographic groups and as such, the presence of these demographic groups may not be influential in the HIV testing decision, but instead normalized. Alternatively, the lack of significant influence could be explained by a limitation of the data - that the data was examined at the zip code level rather than a smaller geographic unit of analysis. Zip codes are large areas and nuances of the population that resides in any given zip code may be lost when a zip code is examined as a whole. It is possible that the predisposing factors would have significantly influenced community health center HIV testing approach had they been examined at a smaller geographic scale.

Enabling Factors: Local Resource Variables such as Ryan White Programs and HIV/STD Testing Resources

This study did not find that enabling factors – local resources, conceptualized as the local presence of Ryan White programs and HIV/STD testing resources, influenced a community health center's HIV testing approach. Given our theoretical model, it was unexpected that these enabling factors did not influence a community health center to provide HIV testing routinely for several reasons. First, Ryan White programs are typically located in areas of pre-determined need so one might assume that if a community has a local Ryan White program, the population in that community is at increased risk for HIV or is disproportionately affected by HIV. Second, another explanation regarding why enabling factors did not significantly influence community health center's HIV testing approach may be that 86 percent of community health centers had an HIV/STD testing site within 10 miles. Given the prevalence of HIV/STD testing sites, community health centers may be accustomed to the presence of these sites in their community to the extent they do not factor their existence in to their decision to routinely HIV test. The fact that these variables did not influence a community health center's HIV testing approach may indicate that community health centers are not aware of their local population's HIV risk, HIV prevalence, HIV resources, or do not have an accurate perception of their community's HIV risk. This misperception of risk is likely, given that as discussed above, despite vulnerable populations being over represented in the community health centers service population, more clinical staff at these community health centers considered the patients and other community members in the service areas to be at low or no risk for HIV infection (30 percent) or average risk (45 percent) than high risk for HIV infection (25 percent). Third, the lack of significant influence could be explained by a limitation of the data - that the data was examined at the zip code level rather than a smaller geographic unit of analysis. Zip codes are large areas and nuances of the resources located in any given zip code may be lost when a zip code is examined as a whole. It is possible that the enabling factors would have significantly influenced community health center HIV testing approach had they been examined at a smaller geographic scale.

Summary

Taken as a whole, it was found that a community health center's HIV testing approach was influenced by need (perception of community HIV risk) and structural characteristics (policies and funding) but not by predisposing factors or enabling factors as conceptualized in our theoretical model. This showed that the gateway provider model was useful in understanding community health center HIV testing approach with regards to need and structural characteristics.

However, the fact that enabling and predisposing factors were not significantly influential could mean that the gateway provider model may not appropriately assess these concepts or that this analysis lacked key variables. Additionally, for predisposing factors, community health centers may be accustomed to serving these demographic groups and as such, the presence of these demographic groups may not be influential, but instead normalized. Further, for enabling factors, community health centers may not be aware of their local population's HIV risk, HIV prevalence, HIV resources, or may not have an accurate perception of their community's HIV risk. Finally, the lack of significant influence of both enabling and predisposing factors could be explained by a limitation of the data - that the data was examined at the zip code level rather than a smaller geographic unit of analysis. It is possible that the factors would have significantly influenced community health center HIV testing approach had they been examined at a smaller geographic scale.

Another explanation regarding why enabling or predisposing factors were not influential or predictive of community health center HIV testing approach is that there are many ways in which enabling and predisposing factors could be conceptualized through the gateway provider model. For example, in the gateway provider model, enabling factors are thought of as factors that facilitate (or impede) patient access to medical services. These include things such as service availability, accessibility, affordability, and acceptability. In this study, based on our literature review and available data, enabling factors were conceptualized as Ryan White HIV/AIDS programs and HIV/STD testing resources in the community, but there may be other ways in which to conceptualize enabling factors that may prove to be more fruitful in predicting community health center HIV testing approach such as HIV testing costs. Similarly, in the gateway provider model, predisposing factors are thought of as patient demographics, risk, and protective issues. In this study, based on our literature review, predisposing factors were conceptualized as the percentage of disproportionately poor, vulnerable, and medically underserved populations including Blacks, Hispanic and/or Latinos, or other persons living in poverty, that are at increased risk for HIV in the community. There may be other ways in which to conceptualize predisposing factors that may prove to be more fruitful in predicting community health center HIV testing approach.

CHAPTER 6

SUMMARY

This chapter reviews the purpose of this study, summarizes the key findings, and connects the conclusions to recent policy changes in HIV testing and implications of these policy changes. It also describes the opportunities to extend the research in new directions in light of the study findings and recent policy changes.

Summary

The Centers for Disease Control and Prevention (CDC) estimates that 1.2 million people in the United States are living with HIV and that 16 percent of those are undiagnosed (CDC, 2013c). Because the spread of the HIV epidemic is fueled by persons who are not aware of their HIV status, the CDC first issued recommendations encouraging healthcare providers to routinely test all patients, aged 13 to 64, regardless of their individual risk factors (CDC, 2006a) and continue to recommend this approach. To begin to eradicate the HIV epidemic, routine HIV testing is needed but research shows that routine testing has not been fully implemented across healthcare settings (Kaiser Family Foundation, 2011; Arya et al. 2012; Office of Inspector General [OIG], 2013a). To fully understand why routine HIV testing is not occurring as part of standard medical care, the medical and public health community need to understand what influences providers to offer and provide HIV tests routinely.

The purpose of this study was to determine what influences community health centers HIV testing approach. A macro level gateway provider theoretical model and used logistic regression were used to explore eight factors that are literature based and might influence community health centers HIV testing approaches. To answer the research question “What influences community health center HIV testing approach?” the following eight variables believed to influence community health center HIV testing approach were tested: (1) community health center staff perception of patient and community risk for HIV, (2) HIV testing policy, (3) HIV specific funding, (4) percent of Black population in the community, (5) percent of Hispanic and/or Latino population in the community, (6) percent of community population living below poverty, (7) existence of a local Ryan White program, and (8) existence of a local HIV and sexually transmitted disease (STD) testing resource. The logistic regression model indicated that three variables (community health center staff perception of patient and community risk for HIV, HIV testing policy, and HIV specific funding) were related to community health center HIV testing approach.

First, all else equal, the odds of offering routine HIV testing for community health centers that perceived their patients and community to be at average risk for HIV were 3.676 times the odds for those centers that perceived their patients and community to be at low or no risk for HIV. Further, the odds of offering routine HIV testing for community health centers that perceived their patients and community to be at high risk for HIV were 4.693 times the odds for those centers that perceived the community to be at low or no HIV risk. Second, all else equal, the odds of offering routine HIV testing for community health centers in which an HIV testing policy exists were 2.202 times the odds for those centers in which an HIV testing policy does not exist. Third, all else equal, the odds of offering routine HIV testing for community health centers that received funding specifically for HIV testing were 2.938 times the odds for those centers that did not receive such funding. No other individual predictor variables in the model were related to community health center HIV testing approach.

Policy Changes since Data Collection

The HIV testing environment has changed substantially since 2010 when data were collected for this study. First, in March of 2010, President Barack Obama signed into law sweeping health reform with the Patient Protection and Affordable Care Act (Patient Protection and Affordable Care Act, [ACA], 2010). ACA included provisions that made preventative care, including HIV testing for all adults at higher risk (targeted testing), more affordable and accessible for Americans.

Second, the United States Preventative Services Task Force, the entity that formally (and at the time of data collection for this study) recommended targeted testing, released a new recommendation statement in April of 2013 that recommended providers screen for HIV infection in adolescents and adults aged 15 to 65 years (United States Preventative Services Task Force, 2013a) and changed their appraisal of routine testing from a “C” rating to an “A: rating.[1] Previously, the Task Force gave routine HIV testing a “C” rating – the recommendation of the service depended upon the patient’s situation (United States Preventative Services Task Force, 2013a).

The important impact of these two changes is that when the United States Preventative Services Task Force changed their rating of routine HIV testing from a “C” to an “A”, routine HIV testing became a preventative service covered under ACA and under Medicaid in general – even in States that did not expand their Medicaid program. Specifically, Section 2713 of ACA stipulates that any group or individual health

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[1] For context, the United States Preventative Services Task Force gives ratings to services ranging from “A” – the Task Force recommends this service, to “D” – the Task Force recommends against this service (United States Preventative Services Task Force, 2013b).

insurance should provide coverage of preventative services that have a rating of “A” or “B” by the United States Preventative Services Task Force, Section 4104 requires Medicare to cover 100 percent of the cost for any preventative service that has a rating of “A” or “B”, and Section 4106 requires Medicaid to provide any preventative services that has an “A” or “B” rating (ACA, 2010).

Additionally, the ACA (Section 10503) created a Community Health Center Fund that provides an additional $10 billion to the Community Health Center program over 5 years (ACA, 2010). Given that the entire 2010 health center program budget was around $3 billion, this additional funding should have a large and extended impact on the range and availability of services community health centers provide (Health Resources and Services Administration [HRSA], 2013b).

These changes should greatly expand the availability of HIV testing to all Americans, especially those served in community health centers, in several ways. First, the endorsement of routine HIV testing by the United States Preventative Services Task Force should raise routine HIV testing awareness in the provider community. Regarding the variable RISK (community health center staff perception of patient and community risk for HIV), which was found to be related to HIV testing approach, these changes regarding HIV testing at the national level may cause providers to reassess the risk of their patients, may cause their perception of community HIV risk to change, and may influence their provision of routine HIV testing.

Second, regarding the variable POLICY (existence of an HIV testing policy), which was found to be related to HIV testing approach - if and when health centers decide to draft or update their existing HIV testing policy, they will find that there is now no entity that recommends targeted testing. The national leading experts in the field of HIV testing, including CDC, the United States Preventative Services Task Force, and others all currently recommend routine HIV testing.

Third, regarding the variable FUNDING (existence of HIV testing specific funding), found to be related to HIV testing approach, these changes that private and public health insurance should now cover HIV testing may alleviate some of the funding burden of routine HIV testing. This is particularly relevant for community health centers whose population, as noted above, depends greatly on Medicaid (National Association of Community Health Centers [NACHC], 2012; HRSA, 2011a). This change does not, however, alleviate the cost burden associated with HIV testing for patients who are uninsured- a great deal of whom rely on community health centers. However, ACA requires that most people buy insurance or pay a penalty in the coming years (Kaiser Family Foundation, 2013). The extent to which this requirement (often referred to as the individual mandate) will affect HIV testing rates is unknown.

Much about the impact of ACA is unknown; however, there is reason to believe that the ACA will have a positive impact on HIV testing. Wagner, Nu, and Sood (2014) modeled the impact of ACA on HIV testing and found that in States that chose to expand their Medicaid coverage (19 at the time of their data analysis, July 2013), an additional 466,153 people would be tested for HIV, which would in turn lead to 2,598 new HIV diagnoses. These new diagnoses would result in a 22 percent reduction in newly insured persons who have HIV but are not aware they have HIV between 2013 and 2017 (Wagner et al. 2014). However, not all States have chosen to expand their Medicaid programs, a point that is key to these statistics. Further, States that have not chosen to expand their Medicaid programs are largely located in the South, the same locations where HIV is spreading most quickly (CDC, 2011d).

Considerations for Further Study

The findings and limitations of this study, as well as the changes discussed above (implementation of ACA and revised United States Preventative Services Task Force recommendations) open up areas upon which future research might build upon. Given that this research used a cross-sectional research design, much may be gained from studying HIV testing in health centers again. Below is a discussion of multiple areas on which future research might focus.

Future research might build upon the finding that provider's perception of their patients and community HIV risk influences the community health center's HIV testing approach, especially because this study could not determine if the community health center's perception of risk was accurate. Perception of risk is fueled by many things, including racism, classism, stereotypes, media etc. Knowing that perception is so influential, but not knowing accuracy of perception or what forms community health center provider's perception is a large area on which future research should focus.

Future research might build upon the finding that community health centers that receive HIV testing specific funding are much more likely to offer HIV testing routinely. Funding, with regards to medical care, has changed substantially since data for this study was collected. For example, the extent to which the ACA requires private and public insurance to cover HIV testing and the extent to which the individual mandate requirement will affect HIV testing rates is a rich new area for future research. As Wagner et al. (2014) found, ACA will impact HIV testing positively in State that have chosen to expand their Medicaid programs. However, the extent to which ACA will impact HIV testing in other States, those that have not chosen to expand their Medicaid programs, is not known. This is particularly of interest given that the majority of States that are not expanding their Medicaid programs are also States that have higher than average HIV diagnoses rates (CDC, 2011d). Future research might consider an analysis of HIV testing in community health centers stratified by States that have expanded their Medicaid or stratified by States grouped by diagnoses rates.

Regarding HIV testing policies, as noted above, it was beyond the scope of this study to gauge implementation of a community health center's HIV testing policy, if one existed. Future research could build upon the finding that community health centers in which HIV testing policies exist are much more likely to offer HIV testing routinely than are community health centers in which an HIV testing policy does not exist by examining implementation of such policies. Additionally, it was beyond the scope of this study to examine the content of a community health center's HIV testing policy, if one existed. Future research could build upon the finding that community health centers in which HIV testing policies exist are much more likely to offer HIV testing routinely than are community health center in which an HIV testing policy does not exist by examining the actual content of such policies. For example, future research might conduct a qualitative document analysis to examine the extent to which and how HIV testing policies, when they exist, address routine HIV testing.

Future research might consider examining the practices in community health centers that do not offer HIV testing at all. Thirty-three community health centers were excluded from the original sample because they did not conduct HIV tests at all and so could not provide answers to relevant questions about how, or to whom, they provided HIV tests. That 33 of 324 community health centers in the sample (10 percent) did not provide HIV tests at all is of concern and the public health community would benefit from research regarding why these community health centers do not provide HIV tests and the extent to which they represent missed opportunities for HIV testing of vulnerable populations.

Another area on which future research might focus is on the group of individuals who decline HIV tests, even when offered routinely. Research has found that many patients don't perceive themselves to be at risk for HIV and so decline HIV testing (Cunningham et al. 2009). For example, the Kaiser Family Foundation, found that in 2011 over one-quarter of African Americans reported never having been tested for HIV and over half of those said they hadn't been tested because they didn't feel as if they were risk for HIV (Kaiser Family Foundation, 2011). Future research might examine what influences patient's perception of their own HIV risk, as well as what might influence patients to have an HIV test, even when they do perceive themselves to be at risk.

While the gateway provider model was helpful in identifying a few variables that influence community health center HIV testing approach, overall, it had a low predictive power ($R^2 = 0.1329$). This may stem from the data set that was used. The data set used may lack some important explanatory variables or the variables used could be conceptualized or measured differently. For example, need, structural characteristics, predisposing factors, and enabling factors, the core of the gateway provider model framework, might be conceptualized differently. Additionally, the variables might be measured at a smaller geographic unit of analysis for a more community specific analysis. Alternatively, other theoretical frameworks (such as the network-episode model alone, or decision theory alone) and explanatory variables that might explain what influences community health center could be explored.

Future research should consider applying the gateway provider model to other care settings and at multiple levels. The gateway provider model has typically only been applied to mental health service provision, but this study that applied it to HIV testing provision showed that it is valid and is applicable across care settings with regards to need and structural characteristics. Additionally, future research should consider using the gateway provider model in other ways at the organizational level as this study did, rather than examining individual providers as most of the research using the model has done. This study illustrates that the gateway provider model is applicable at the macro level and future research would do well to consider further macro level application.

Conclusion

The findings of this research are important because they give insight in to what influences community health centers, which serve populations that are disproportionately diagnosed and affected by HIV, to routinely test for HIV. Increased HIV testing in community health centers could curb HIV health disparities substantially because knowing one’s HIV status generally leads to a reduced spread of the disease through change in behaviors and treatment. However, community health centers do not routinely test their patients, even the vulnerable populations they serve, for HIV. Knowing that community health center provider’s perception of patient and community

HIV risk, policies, and funding influences community health centers HIV testing approach so much, the medical and public health community can begin to target education toward providers. We also know, based on previous research, that a provider’s perception of patient and community HIV risk may be inaccurate. So, the medical and public health community might begin to target preconceived notions of risk, which in the past were based on risky behaviors such as unprotected sex or intravenous drug use, as well as social images and culture (i.e. the image of Black men who have sex with men as the predator spreading HIV to Black women). Despite that there are still risky behaviors, behavior, identity, orientation, or stereotypes should no longer be the basis upon which providers should test patients for HIV.

The enactment of ACA and the new routine HIV testing recommendations from the United States Preventative Services Task Force that occurred since data collection for this study will likely change the environment regarding HIV testing policies and funding. However, implementation of ACA and new recommendations may not change provider perceptions. These perceptions will continue to be important for Sociology and more specifically, important for Medical Sociology. Generally, social forces, such as media and stereotypical images shown in the media, influence perception. These social forces that influence perception, in this instance regarding HIV testing approach, have a negative impact and may inhibit vulnerable populations from receiving the health care they need, contributing to health disparities. Health disparities are intertwined with other social issues such as employment, human rights, and influence multiple social institutions such as government and religion. These findings reinforce the idea that these social forces impact our daily lives and our society in multiple ways.

APPENDIX

COMMUNITY HEALTH CENTER SURVEY

Q3. To what extent do the majority of clinical staff at your service site consider patients and other community members in the service areas to be at risk for HIV infection?

- ☐ High risk
- ☐ Average risk
- ☐ Low risk
- ☐ No risk
- ☐ Other

Please describe.

Q6. Does your service site have a policy regarding who should receive an HIV test?

☐ Yes, written

☐ Yes, verbal

☐ No, provider discretion is allowed or encouraged

☐ Other

Please specify below.

Q8. In your service site, which patients are typically tested for HIV? Check all that apply. If not applicable, please indicate in the notes below.

- ☐ Patients who request an HIV test
- ☐ Patients with signs or symptoms of HIV or AIDS
- ☐ Patients with identified risk factors (such as a history of injection drug use, sexual contact with an HIV-infected person, hepatitis C virus infection, any STD within the past 12 months, male patient who reports having sex with men, a history or sexual contact with injection drug users, hepatitis B virus infection, or with a history of blood transfusion before 1985)
- ☐ Adult patients (ages 18 and older) regardless of risk factors
- ☐ Teenage patients (ages 13 – 17) regardless of risk factors
- ☐ Pregnant women (all ages)
- ☐ Other

Notes:

Q9. Did your service site receive funding specifically for HIV testing in 2010?

- ☐ Yes
- ☐ No
- ☐ Unknown

REFERENCES

Adimora, A., and Schoenbach, V. (2002). Contextual factors and the Black-White disparity in heterosexual HIV transmission. *Epidemiology, 13*, 707-712.

Adimora, A., and Schoenbach, V. (2005). Social context, sexual networks, and racial disparities in rates of sexually transmitted infections. *Journal of Infectious Diseases, 191*, S115-S122.

AIDS.gov. (2014). HIV/AIDS basics. Retrieved from http://aids.gov/hiv-aids-basics/index.html

Albert, D. (1978). Decision theory in medicine: A review and critique. *Health and Society, 56*(3), 362-401.

Allison, P. (1999). *Multiple regression: A primer*. Thousand Oaks, CA: Pine Forge Press.

Allison, P. (2012). *Logistic regression using SAS: Theory and application* (2nd ed.). Cary, NC: SAS Institute, Inc.

Anaya, H., Hoang, T., Golden, J., Goetz, M., Gifford, A., Bowman, C., and Asch, S., (2008). Improving HIV screening and receipt of results by nurse-initiated streamlined counseling and rapid testing. *Journal of General Internal Medicine*, *23,* 800-807.

Arya, M., Patuwo, B., Lalani, N., Bush, A., Kallen, M., Street, R., Viswanath, K., and Giordano, T. (2012). Are primary care providers offering HIV testing to patients in predominantly Hispanic community health center? An exploratory study. *AIDS Patient Care and STDs*, *26*(5), 256-258.

Babbie, E. (2007). *The practice of social research* (11th ed.). Belmont, CA: Thomson Wadsworth.

Bates, I., Fenton, C., Gruber, J., Lalloo, D., Lara, A. and Squire, S. (2004). Vulnerability to malaria, tuberculosis, and HIV/AIDS infection and disease. Part 1: Determinants operating at individual and household level. *Lancet of Infectious Diseases*, *4*, 267-277.

Bergenstro, A., and Sherr, L. (2010). A review of HIV testing policies and procedures for pregnant women in public maternity units of Porto Alegre, Rio Grande do Sul, Brazil. *AIDS Care: Psychological and Socio-medical Aspects of AIDS/HIV*, *12*(2), 177-186.

Bernstien, K., Begier, E., Burke, R., Karpati, A., and Hogben, M. (2008). HIV screening among U.S. physicians, 1999-2000. *AIDS Patient Care and STDs, 22*(8), 649-656.

Bokhour, B., Solomon, J., Knapp, H., Asch, S., and Gifford, A. (2009). Barriers and facilitators to routine HIV testing in VA primary care. *Journal of General Internal Medicine, 24*, 1109-1114.

Bond, L., Lauby, J., and Batson, H. (2005). HIV testing and the role of individual and structural level barriers and facilitators. *AIDS Care, 17*(2), 125–140.

Bond, L., Wheelter, D., Millett, G.., LaPollo, A., Carson, L,. and Liau, A. (2009). Black men who have sex with men and the association of the down-low identify with HIV risk behavior. *American Journal of Public Health, 99*(Supplement 1), S92-S95.

Boydell, K., Volpe, T., Gladstone, B., Stasiulis, E., and Addington, J. (2013). Youth at ultra-high risk for psychosis: Using the reviewed network episode model to examine pathways to mental health care. *Early Intervention in Psychiatry*, *7*, 170-186.

Brennan, P. (1995). Patient satisfaction and normative decision theory. *Journal of American Medical Informatics Association, 2*, 250-259.

Brooks R. etzel, M., Hinojos E., Henry C., and Perez M. (2005). Preventing HIV among Latino and African American gay and bisexual men in a context of HIV-related stigma, discrimination, and homophobia: Perspectives of providers. *AIDS Patient Care and STDS, 19*(11), 737–744.

Burke. R., Sepkowitz, K., Bernstein, K., Karpati, A., Myers, J., and Tsoi, B. (2007). Why don't physicians test for HIV? A review of the US literature. *AIDS*, *21*(12), 1617–1624.

Bunger, A., Stiffman, A., Foster, K., and Shi, P. (2010). Child welfare workers' connectivity to resources and youth's receipt of services. *Advances in Social Work*, *10*(1), 19-38.

Bustamante, A., Fang, H., Garza, J., Carter-Pokras, O., Wallace, S., Rizzo, J., and Ortega, A. (2012). Variations in healthcare access and utilization among Mexican immigrants: the role of documentation status. *Journal of Immigrant and Minority Health*, *14*, 146-155.

Byamugisha, R., Tylleskar, T., Kagawa, M., Onyango, S., Karamagi, C., and Tumwine, J. (2010). Dramatic and sustained increase in HIV-testing rates among antenatal attendees in eastern Uganda after a policy change from voluntary counseling and testing to routine counseling and testing for HIV: A retrospective analysis of hospital records, 2002- 2009. *BMS Health Services Research, 10*:290.

Calderon, Y., Haughey, M., Leider, J., Bijur, P., Gennis, P., and Bauman, L. (2007). Increasing willingness to be tested for human immunodeficiency virus in the emergency department during off-hour tours: A randomized trial. *Sexually Transmitted Diseases*, *34*, 1025–1029.

Campsmith, M., Rhodes, P., Hall, H., and Green, T. (2010). Undiagnosed HIV prevalence among adults and adolescents in the United States at the end of 2006. *Journal of Acquired Immune Deficiency Syndrome, 53*, 619–624.

Cardoza, V., Documet, P., Fryer, C., Gold, M., and Butler, J. (2012). Sexual health behavior interventions for U.S. Latino adolescents: A systematic review of the literature. *Journal of Pediatric Adolescent Gynecology*, *25*(2), 136-149.

Castilla, J., Del Romero, J., Hernando, V., Marincovich, B., Garcia, S., and Rodriguez, C. (2005). Effectiveness of highly active antiretroviral therapy in reducing heterosexual transmission of HIV. *Journal of Acquired Immune Deficiency Syndrome, 40*(1), 96–101.

CDC. (2003). Late versus early testing of HIV—16 Sites, United States, 2000–2003. *MMWR Morbidity and Mortality Weekly Report*, *52*, 581–586.

CDC. (2005). HIV prevalence, unrecognized infection, and HIV testing among men who have sex with men—five U.S. cities, June 2004–April 2005. *MMWR Morbidity and Mortality Weekly Report*, *54*, 597–601.

CDC. (2006a). Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health care settings. *MMWR Morbidity and Mortality Weekly Report*, *55*, 1-17.

CDC. (2006b). Sexually transmitted diseases treatment guidelines. *MMWR Morbidity and Mortality Weekly Report*, *55*, 1– 94.

CDC. (2007) Cases of HIV infection and AIDS in the United States and dependent areas. *HIV/AIDS Surveillance Reports*, *19*.

CDC. (2010a). Communities in crisis: Is there a generalized HIV epidemic in impoverished urban areas of the United States? Retrieved from http://198.246.124.29/hiv/topics/surveillance/resources/other/pdf/poverty_poster.pdf

CDC. (2010b). National HIV and STD testing resource database. http://hivtest.cdc.gov/

CDC. (2010c). Deaths, percent of total deaths, and death rates for the 15 leading causes of death in 10-year age groups by Hispanic origin, race for non-Hispanic population, and sex: United States, 1999–2006. Retrieved from http://www.cdc.gov/nchs/nvss/mortality_tables.htm.

CDC. (2011a). HIV among Hispanics/Latinos. Retrieved from http://www.cdc.gov/hiv/hispanics/resources/factsheets/hispanic.htm.

CDC. (2011b). Division of HIV/AIDS prevention strategic plan, 2011 through 2015. Retrieved from http://www.cdc.gov/hiv/strategy/dhap/pdf/dhap-strategic-plan.pdf.

CDC. (2011c). HIV among Blacks. Retrieved from http://www.cdc.gov/hiv/topics/aa/PDF/aa.pdf.

CDC. (2011d). Characteristics associated with HIV infection among heterosexuals in urban areas with high AIDS prevalence – 24 Cities, United States, 2006-2007. *MMWR Morbidity and Mortality Weekly Report*, *60*(31), 1045-1049.

CDC. (2012a). Estimated HIV incidence among adults and adolescents in the United States, 2007-2010. *HIV Surveillance Supplemental Report 2012, 17*(4), Retrieved from http://www.cdc.gov/hiv/topics/surveillance/resources/reports/#supplemental.

CDC. (2012b). Monitoring selected national HIV prevention and care objectives by using HIV surveillance data—United States and 6 U.S. dependent areas—2010. *HIV Surveillance Supplemental Report 2012, 17*(3), Retrieved from http://www.cdc.gov/hiv/topicssurveillance/resources/reports/.

CDC. (2013a). Living with HIV. Retrieved from http://www.cdc.gov/hiv/living/index.html.

CDC. (2013b). HIV testing in the United States. Retrieved from http://www.cdc.gov/nchhstp/newsroom/docs/HIV-Testing-US-508.pdf.

CDC. (2013c). Monitoring selected national HIV prevention and care objectives by using HIV surveillance data – United States and 6 U.S. dependent areas – 2011. *HIV Surveillance Supplemental Report, 18*(5), Retrieved from http://www.cdc.gov/hiv/pdf/2011_monitoring_hiv_indicators_hssr_final.pdf.

CDC. (2013d). HIV among Hispanics/Latinos in United States and dependent areas. Retrieved from http://www.cdc.gov/hiv/pdf/risk_latino.pdf.

CDC. (2013e). HIV among older Americans. Retrieved from http://www.cdc.gov/hiv/pdf/library_factsheet_HIV_%20AmongOlderAmericans.pdf.

CDC. (2014a). HIV basics. Retrieved from http://www.cdc.gov/hiv/basics/index.html.

CDC. (2014b). HIV among African Americans. Retrieved from http://www.cdc.gov/hiv/pdf/risk_HIV_AfricanAmericans.pdf.

CDC. (2014c). Progress along the continuum of HIV care among Blacks with diagnosed HIV- United States, 2010. *MMWR Morbidly and Mortality Weekly Review*, *63*(5), 85-89.

Chandisarewa, W., Stranix-Chibanda, L., Chirapa, E., Miller, A., Simoyi, M., Mahomva, A., Maldonado, Y., and Shetty, A. (2007). Routine offer of antenatal HIV testing ("opt-out" approach) to prevent mother-to-child transmission of HIV in urban Zimbabwe. *Bulletin of the World Health Organization,* 85, 843-850.

Chapman, G., and Sonneberg, F. (2000). *Decision making in health care: Theory, psychology, and applications*. New York: Cambridge University Press.

Chen, N., Gallant, J., and Page, K. (2011). A systematic review of HIV/AIDS survival and delayed diagnosis among Hispanics in the United States. *Journal of Immigrant and Minority Health, 14*(1), 65-81.

Chun, T., Justement, J., Moir, S., Hallahan, C., Maenza, J., Mullins, J., and Fauci, A. (2007). Decay of the HIV reservoir in patients receiving antiretroviral therapy for extended periods: implications for eradication of virus. *Journal of Infectious Diseases*, *195*(12), 1762-1764.

Cohen, D., Scribner, R., and Farley, T. (2000). A structural model of health behavior: A pragmatic approach to explain and influence health behaviors at the population level. *Preventative Medicine*, *30*(2), 146–54.

Cohen, M., Chen, Y., and McCauley, M. (2011). Prevention of HIV-1 infection with early antiretroviral therapy. The HPTN 052 Study Team. *New England Journal of Medicine,* 365(6), 493-505.

Collins, J., and Rau, W. (2000). AIDS in the context of development. United Nations Research Institute for Social Development Programme on Social Policy and Development. Paper Number 4. Retrieved from http://www.unrisd.org/80256B3C005BB128/%28httpProgrammeAreasForResearchHome%29/BFA13785EC135F568025718B003C5FA7?OpenDocument.

Cox, J., Graves, L., Marks, S., Tremblay, C., Stephenson, R., Lambert-Lanning, A., and Steban, M. (2011). Knowledge, attitudes and behaviors associated with the provision of Hepatitis C care by Canadian family physicians. *Journal of Viral Hepatitis*, *18*(7), 3332-3340.

Cunningham, C., Doran, B., DeLuca, J., Dyksterhouse, R., Asgary, R., and Sacajiu, G. (2009). Routine opt-out HIV testing in an urban community health center. *AIDS Patient Care and STDs, 23,* 619-623.

Delvaux, T., Diby Konan, J., Ake-Tano, O., Gohou-Kouassi, V., Bosso, P., Buve, A., and Ronsmans, C. (2008). Quality of antenatal and delivery care before and after the implementation of a prevention of mother-to-child HIV transmission programme in Cote d'Ivoire. *Tropical Medicine and International Health*, *13*(8), 970-979.

Derzon, J., Sale, E., Springer, M, and Brounstein, P. (2005). Estimating invention effectiveness: Synthetic projection of field evaluation results. *The Journal of Primary Prevention*, *26*, 321-343.

Diaz, R., (2000). Latino Gay Men and Psycho-Cultural Barriers to AIDS Prevention. In Levine, M. and Nardi, P. (Eds.) *Changing Times: Gay Men and Lesbians Encounter HIV/AIDS*. Chicago: University of Chicago Press.

Dievler, A. and Pappas, G. (1999). Implications of social class and race for urban public health policy making: A case study of HIV/AIDS and TB policy in Washington, D.C. *Social Science and Medicine, 48*, 1095-1102.

Dillon, P., and Basu, A. (2014). HIV/AIDS and minority men who have sex with men: A meta-ethnographic synthesis of qualitative research. *Health and Community*, *29*(2), 182–192.

Do, T., Chen, S., and McFarland, W. (2005). HIV testing patterns and unrecognized HIV infection among young Asian and Pacific Islander men who have sex with men in San Francisco. *AIDS Education and Prevention, 17,* 540–554.

Dolezsar, C., McGrath, J., Herzig, A., and Miller, S. (2014). Perceived racial discrimination and hypertension: A comprehensive systematic review. *Health Psychology,* 33(1), 20-34.

Donnell, D., Baeten, J., and Kiarie, J., (2010). Heterosexual HIV-1 transmission after initiation of antiretroviral therapy: A prospective cohort analysis. *Lancet, 375*, 2092–2098.

Dorell, C., Sutton, M., Oster, A., Hardnett, F., Thomas, P., Gaul, Z., Mena, L., and Heffelfinger, J. (2011). Missed opportunities for HIV testing in health care settings among young African American men who have sex with men: Implications for the HIV epidemic. *AIDS Patient Care and STDs, 25*(11), 657-665.

Doshi, R., Malebranche, D., Bowleg, L., and Sangaramoorthy, T. (2013). Health care and HIV testing experiences among Black men in the south: Implications for “seek, test, treat, and retain” HIV prevention strategies. *AIDS Patient Care and STDs*, *27*(2), 123-133.

Doyle, J., Degenhardt, L., and Pedrana, A. (2013, June/July). *Meta-analysis of effects of antiretroviral therapy use on sexual and injecting risk-taking behavior*. Paper presented at the 7th International AIDS Society Conference of HIV Pathogenesis, Treatment, and Prevention. Kuala Lumpur, June 30-July 3, 2013.

Durlak, J. and DuPre, E. (2008). Implementation matters: A review of research on the influence of implementation on program outcomes and the factors affecting implementation. *American Journal of Community Psychology*, *41*(3-4), 327-350.

Ebrahim, S., Anderson, J., Weidle, P., and Purcell, D. (2004). Race/Ethnic disparities in HIV testing and knowledge about treatment for HIV/AIDS: United States, 2001. *AIDS Patient Care and STDS, 18*, 27–33.

Edelman, E., Dinh, A., Moore, B., Schottenfeld, R., Fiellin, D., and Fiellin, L. (2012). HIV testing practices among buprenorphine-prescribing physicians. *Journal of Addiction Medicine, 6*(2), 159-165.

Edmonds, J., Hruschka, D., Bernard, R., and Sibley, L. (2012). Women's social network and birth attendant decisions: Application of the network-episode model. *Social Science and Medicine*. *74*(3), 452-459.

Espinoza, L., Hall, H., and Hu, X. (2009). Increases in HIV diagnoses at the U.S.-Mexico border, 2003–2006. *AIDS Education Prevention*, *21*(Supplement 5), 19–33

Espinoza, L., Hall, H., Selik, R., and Hu, X. (2008). Characteristics of HIV infection among Hispanics, United States 2003-2006. *Journal of Acquired Immune Deficiency Syndromes*, *49*(1), 94-101.

Fernandez, M., Wilson, T. ethier, K., Walter, E., Gay, C., and Moore, J. (2000). Do pregnant women accept HIV tests offered during prenatal care? The Perinatal Guidelines Evaluation Project. *Public Health Reports*, *115*, 460–468.

Fernandez, M., Bowen, G., Perrino, T., Royal, S., Mattson, T., Arheart, K., and Cohn, S., (2003). Promoting HIV testing among never-tested Hispanic men: A doctor's recommendation may suffice. *AIDS and Behaviors*, *7*(3), 253 – 262.

Fielding-Miller, R., Mnisi, Z., Adams, D., Baral, S., and Kennedy, C. (2014). "There is hunger in my community": A qualitative study of food security as cyclical force in sex work in Swaziland. *BMC Public Health, 14*(79), 1471-1479.

Fincher-Mergi, M., Cartone, K., Mischler, J., Pasieka, P., Lerner, E., and Billittier, A. (2002). Assessment of emergency department health care professionals' behaviors regarding HIV testing and referral for patients with STDs. *AIDS Patient Care STDs, 16*(11), 549–553.

Fixen, D., Naoom, S., Blasé, K., Friedman, R., and Wallace, F. (2005). Implementation research: A synthesis of the literature. Tampa, FL: University of South Florida, Louis de la parte Florida Mental Health Institute. *The National Implementation Research Network* (FMHI Publication #231).

Fox, J. (1997). Applied regression analysis, linear models, and related methods. Thousand Oaks: Sage

Gabrysch, S., Edwards, T., and Glynn, J. (2008). The role of context: Neighbourhood characteristics strongly influence HIV risk in young women in Ndola, Zambia. *Tropical Medicine and International Health, 13*(2), 162-170.

George, D., and Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference, 11.0 update.* New York: Allyn and Bacon.

Gilbert, P. and Rhodes, S., (2013). HIV testing among immigrant sexual and gender minority Latinos in a US region with little historical Latino presence. *AIDS Patient Care,* 27(11), 628-636.

Ginexi, E .and Hilton, T. (2006). What's next for translation research. *Evaluation and the Health Professions, 29*(3), 334-347

Gloria, A., and Peregoy, J. (2006). Counseling Latino alcohol and other substance users/abusers. Cultural considerations for counselors. *Substance Abuse Treatment*, *13*, 119–126.

Goparaju, L. and Warren-Jeanpeire, L. (2012). African American women's perspectives on 'down low/DL' men: Implications for HIV prevention. *Culture, Health and Sexuality: An International Journal of Research, Intervention and Care*, *14*(8), 879-893.

Granich, R., Gilks, C., Dye, C., De Cock, K., and Williams, B. (2009). Universal voluntary HIV testing with immediate antiretroviral therapy as a strategy for elimination of HIV transmission: A mathematical model. *Lancet, 373*(9657), 48–57.

Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P., Kyriakidou, O., and Peacock, R. (2005). *Diffusion of innovations in health service organizations: A Systemic literature review*. Oxford: Blackwell.

Greenwald, J., Rich, C., Bessega, S., Posner, M., Maeda, J. and Skolnik, P. (2006). Evaluation of the Centers for Disease Control and Prevention's recommendations regarding routine testing for human immunodeficiency virus by an inpatient service: Who are we missing? *Mayo Clinical Procedures*, *81*, 452–458.

Greenwald, J., Hall, J. and Skolnik, P. (2006). Approaching the CDC's guidelines on the HIV testing of inpatients: Physician-referral versus nonreferral-based testing. *AIDS Patient Care STDs, 20*(5), 311–317.

Grodensky, C., Golin, C., Boland, M., Patel, S., Quinlivan, E. and Price, M. (2008). Translating concern into action: HIV care providers' views on counseling patients about HIV prevention in the clinical setting. *AIDS Behavior, 12*, 404–411.

Hailey, J. and Lamont, B. (2012). Addressing racism and homophobia to reduce the incidents of HIV in African American MSM youth and young adults. *Journal of Adolescent Health, 50*(2), S30-S31.

Hall, H., Byers, R., Ling, Q., and Espinoza, L. (2007). Racial/ethnic and age disparities in HIV prevalence and disease progression among men who have sex with men in the United States. *American Journal of Public Health, 97*(6), 1060–1066.

Hall, H., Frazier, E., Rhodes, P., Holtgrave, D.., Furlow-Parmley, C., Tang, T., Gray, K., Cohen, S., Mermin, J. and Skarbinski, J. (2013). Differences in human immunodeficiency virus care and treatment among subpopulations in the United States. *JAMA Internal Medicine, 174*(14), 1337-1344.

Hall, H., Geduld ,J., Boulos, D., Rhodes, P., An, Q., and Mastro, T. (2009). Epidemiology of HIV in the United States and Canada: Current status and ongoing challenges. *Journal of Acquired Immune Deficiency Syndrome, 51*(Supplement 1), S13–20.

Hall, H., Holtgrave, D. and Maulsby, C. (2012). HIV transmission rates from persons living with HIV who are aware and unaware of their infection. *AIDS*, *26*(7), 893-896.

Harris, J., Stewart, S., Pratt, B., Woods, E., and Samples, C. (2004). Opportunities to increase HIV testing among young men of color. *Journal of Adolescent Health, 34,* 146–147.

HRSA. (2010). Ryan White HIV/AIDS medical care providers database. Retrieved from http://findhivcare.hrsa.gov/Search_HAB.aspx.

HRSA. (2011a). Bureaus and Offices. Retrieved from http://www.hrsa.gov/about/organization/bureaus/index.html

HRSA. (2011b). Uniform Data System. Retrieved from http://bphc.hrsa.gov/healthcenterdatastatistics/

HRSA. (2013a). AIDS Education and Training Centers, National Clinicians Consultation Centers. *Compendium of State HIV Testing Laws.* Retrieved from http://www.nccc.ucsf.edu/consultation_library/state_hiv_testing_laws/

HRSA. (2013b) Jim Macrae Biography. Retrieved from http://www.hrsa.gov/about/organization/bureaus/bphc/biomacrae.html

HRSA. (2014a). Who was Ryan White? Retrieved from http://hab.hrsa.gov/abouthab/ryanwhite.html

HRSA. (2014b). HIV/AIDS Program Biennial Progress Report. Retrieved from http://hab.hrsa.gov/data/biennialprogressrpts.html.

Hirschhorn, L., Landers, S., McInnes, D., Malitz, F., Ding, L., Joyce, R., and Clearly, P. (2009). Reported care quality in federal Ryan White HIV/AIDS Program supported networks of HIV/AIDS Care. *AIDS Care*, *21*(6), 799-807.

Hosmer, D. and Lemeshow, S. (2000). *Applied logistic regression.* (2nd ed.). New York: Wiley.

Huck, S. (2000). *Reading statistics and research*. New York, Harper Collins.

Hudson, D., Puterman, E., Bibbins-Domingo, K., Matthews, K. and Adler, N. (2013). Race, life course socioeconomic position, racial discrimination, depressive symptoms, and self-rated health. *Social Science and Medicine,* 97, 7-14.

Inungu, J., Quist-Adade, C., Beach, E., Cook, T. and Lamerato, M. (2005). Shift in the reasons why adults seek HIV testing in the United States: Policy implications. *AIDS Reader*, *15*(1), 35-38.

Johns, M., Bauermeister, J. and Zimmerman, M. (2010). Individual and neighborhood correlates of HIV testing among African American youth transitioning from adolescence into young adulthood. *AIDS Education and Prevention, 22*(6), 509-522.

Johnson, R. (2004a). Racial and ethnic difference in patient perceptions of bias and cultural competence in health care. *Journal of General Internal Medicine, 19*(2), 101-110.

Johnson, R. (2004b) Patient race/ethnicity and quality of patient physician communication during medical visits. *American Journal of Public Health, 94*(12), 2084-2090.

Johnson, D., Sorvillo, F., Wohl, A., Bunch, J., Carruth, A. and Castillon, M. (2003). Frequent failed early HIV detection in a high prevalence area: Implications for prevention. *AIDS Patient Care and STDs*, *17*, 277-282.

Johnson, C., Mimiaga, M. and Reisner, S. (2009). Health care access and sexually transmitted infection screening frequency among at-risk Massachusetts men who have sex with men. *American Journal of Public Health*, *99*(Supplement 1), S187–192.

Johnson, C., Mimiaga, M., Reisner, S., VanDerwarker, R, and Mayer, K., (2011). Barriers and facilitators to routine HIV testing: Perceptions from Massachusetts community health center personnel. *AIDS Patient Care and STDs, 25,* 647–655.

Kaiser Family Foundation. (2007). Key Facts: Race ethnicity and medical care. Retrieved from http://www.kff.org/minorityhealth/upload/6069-02.pdf

Kaiser Family Foundation. (2011). Survey of Americans on HIV/AIDS—Toplines. Retrieved from www.kff.org/kaiserpolls/upload/8186-T.pdf.

Kaiser Family Foundation (2013). The requirement to buy coverage under the Affordable Care Act. Retrieved from http://kff.org/infographic/the-requirement-to-buy-coverage-under-the-affordable-care-act/.

Kaukinen, C. and Fulcher, C. (2006). Mapping the social demography and location of HIV services across Toronto neighbourhoods. *Health and Social Care in the Community*, *14*(1), 37-48.

Kelly, J., Somlai, A., Benotsch, E., Amirkhanian, Y., Fernandez, M. and Stevenson, Y. (2006). Programmes, resources, and needs of HIV-prevention nongovernmental organizations (NGOs) in Africa, Central/Eastern Europe and Central Asia, Latin America and the Caribbean. *AIDS Care, 18*(1), 12-21.

Kincaid, D. (2004). From innovation to social norm: Bounded normative influence. *Journal of Health Communications,* 9(Supplement 1), 37-57.

Kinsler, J., Wong, M., Sayles, J., Davis, C. and Cunningham, W. (2007). The effect of perceived stigma from a health care provider on access to care among a low-income HIV-positive population. *AIDS Patient Care STDs, 21*, 584–592.

Kirby, J. and Kaneda, T. (2005). Neighborhood socioeconomic disadvantage and access to health care. *Journal of Health and Social Behavior, 46*, 15–31.

Korthuis, P., Berkenblit, G., Sullivan, L., Cofrancesco, J., Bass, M., Bashook, P. and Sosman, J. (2011). General internists' belief, behaviors, and perceived barriers to routine HIV screening in primary care. *AIDS Education and Prevention*, *23*, 70-83.

Lalani, T. and Hicks, C. (2008). Does antiretroviral therapy prevent HIV transmission to sexual partners? *Current Infectious Disease Reports*, *10*, 140-145.

Landon, B., Wilson, I., Wenger, N., Cohn, S., Fichtenbaum, C., Bozzette, S., Shaprio, M. and Cleary, P. (2002). Specialty training and specialization among physicians who treat HIV/AIDS in the United States. *Journal of General Internal Medicine*, *17*(1), 12-22.

Laraque, F., Mavronicolas, H., Robertson, M., Gortakowski, H., and Terzian, A. (2013). Disparities in community viral load among HIV-infected persons in New York City. *AIDS, 27*, 2129-2139.

Lauby, J., Millett, G., LaPollo, A., Bond, L., Murrill, C. and Marks, G. (2008). Sexual risk behaviors of HIV-positive, HIV- negative, and serostatus-unknown black men who have sex with men and women. *Archives of Sexual Behavior, 37*, 708–719.

Laumann, E., Glaser, D., Neves, R., and Moreira, E. (2009). A population-based survey of sexual activity, sexual problems, and associated help-seeking behavior patterns among mature adults in the United States of American*. International Journal of Impotence Research*, *21*, 171-178.

LaVeist, T. (2005). *Minority populations and Health: An introduction to health disparities in the United States*. San Francisco, CA: Jossey-Bass.

Lebrun, L. (2012). Effects of length of stay and language proficiency on health care experiences among immigrants in Canada and the United States. *Social Science and Medicine, 74*(7), 1062-1072.

Lee, Y., Dancy, B., Florez, E. and Holm, K. (2013). Factors related to sexual practices and successful sexually transmitted infection/HIV intervention programs for Latino adolescents*. Public Health Nursing*, *30*(5), 390-401.

Levine, R., Foster, J. and Fullilove, R. (2001). Black-White inequalities in mortality and life expectancy, 1933-1999. Implications for Healthy People 2010. *Public Health Reports*. *116*, 474-483.

Levy, V., Page-Shafer, K., Evans, J., Ruiz, J., Morrow, S., and Reardon, J. (2005). HIV-related risk behavior among Hispanic immigrant men in a population-based household survey in low-income neighborhoods of northern California. *Sexually Transmitted Diseases, 32*, 487-490.

Levy, V., Prentiss, D., Balmas, G., Chen, S., Israelski, D. and Katzenstein, D. (2007). Factors in delayed HIV presentation of immigrants in northern California: Implications for voluntary counseling and testing programs. *Journal of Immigrant Health*, *9*, 49-54.

Levy, M., Wilton, L., Phillips, G., Glick, S., Kuo, I., Brewer, R., Elliot, A., Watson, C. and Magnus, M. (2014). Understanding structural barriers to accessing HIV testing and prevention services among Black men who have sex with men in the United States. *AIDS Behavior.* Published online, no volume or pages as of current.

Liddicoat, R., Losina, E., Kang, M., Freedberg, K. and Walensky, R. (2006). Refusing HIV testing in an urgent care setting: Results from the ‘‘Think HIV’’ program. *AIDS Patient Care and STDs*, *20*(2), 84-92.

Long, J. (1997). *Regression models for categorical and limited dependent variables.* Thousand Oaks, CA: Sage.

Lopez-Quintero, C., Shtarkshall, R. and Neumark, Y. (2005). Barriers to HIV-testing among Hispanics in the United States: Analysis of the National Health Interview Survey, 2000. *AIDS Patient Care STDs, 19*, 672–683.

Loue, S., Cooper, M. and Fiedler, J. (2003). HIV knowledge among a sample of Puerto Rican and Mexican men and women. *Journal of Immigrant Health*, *5*(2), 59-65.

Lyons, M., Lindsell, C., Ledyard, H., Frame, P. and Trott, A. (2005). Emergency department HIV testing and counseling: An ongoing experience in a low-prevalence area. *Annals of Emergency Medicine, 46*, 22–28.

Lyons, M., Lindsell, C., Ruffner, A., Wayne, D., Hart, K., Sperling, M., Trott, A. and Fichtenbaum, C. (2013). Randomized comparison of universal and targeted HIV screening in the emergency department. *Journal of Acquired Immunodeficiency Syndrome, 64*(3), 315-323.

MacKellar D., Valleroy, L. and Secura, G., (2005). Unrecognized HIV infection, risk behaviors, and perceptions of risk among young men who have sex with men: Opportunities for advancing HIV prevention in the third decade of HIV/AIDS. *Journal of Acquired Immune Deficiency Syndrome, 38*, 603–614.

MacKellar, D., Valleroy, L. and Anderson, J. (2006). Recent HIV testing among young men who have sex with men: Correlates, contexts, and HIV seroconversion. *Sexually Transmitted Diseases*, *33*, 183–192.

Maes, C. and Louis, M. (2011). Nurse practitioners' sexual history-taking practices with adults 50 and older. *Journal for Nurse Practitioners*, *7*, 216-222.

Magnus, M., Herwehe, J., Murtaza-Rossini, M., Reine, P., Cuffie, D., Gruber, D. and Kaiser, M. (2013). Linking and retaining HIV patients in care: The importance of provider attitudes and behaviors. *AIDS Patient Care STDs, 27*(5), 297-303.

Mahajan, A., Sayles, J., Patel, V., Remien, R., Sawires, S.., Ortiz, D. and Coates, T. (2008) Stigma in the HIV/AIDS epidemic: A review of the literature and recommendations for the way forward. *AIDS, 22*, S67-S79.

Maman, S., Abler, L., Parker, L., Lane, T., Chirowodza, A. and Ntogwisangu, J. (2009). A comparison of HIV stigma and discrimination in five international sites: The influence of care and treatment resources in high prevalence settings. *Social Science Medicine, 68*(12), 2271–2278.

Mari-Dell'Olmo, M., Roderiguez-Sanz, M. and Garcia-Olalla, P. (2007). Individual and community-level effect in the socioeconomic inequalities of AIDS related mortality in an urban area of southern Europe. *Journal of Epidemiology and Community Health*, *61*(3), 232-240.

Marks, G., Crepaz, N., Senterfitt, J. and Janssen, R. (2005). Meta-analysis of high-risk sexual behavior in persons aware and unaware they are infected with HIV in the United States: Implications for HIV prevention programs. Journal of Acquired Immune Deficiency Syndrome, *39*, 446--453.

Marks, G., Crepaz, N. and Janssen, R. (2006). Estimating sexual transmission of HIV from persons aware and unaware that they are infected with the virus in the USA. *AIDS, 20*, 1447–1450.

Marx, R., Hirozawa, A., Soskolne, V., Liu, Y. and Katz, M. (2001). Barriers to getting needed services for Ryan White CARE clients. *AIDS Care, 13*(2), 233-242.

Menard, S. (1995). *Applied logistic regression analysis*. Thousand Oaks, CA: Sage.

Miller, J. (2000). Differences in AIDS knowledge among Spanish and English speakers by socioeconomic status and ability to speak English. *Journal of Urban Health*, *77*(3), 415-424.

Miller, R., Bedney, B., Guenther-Gray, C. and the City Project Study Team. (2003). Assessing organizational capacity to deliver HIV prevention services collaboratively: Tales from the field. *Health Education and Behavior, 30*(5), 582-600.

Mimiaga, M., Goldhammer, H., Belanoff, C., Tetu, A. and Mayer, K., (2007). Men who have sex with men: Perceptions about sexual risk, HIV and sexually transmitted disease testing, and provider communication. *Sexually Transmitted Diseases*, *34*, 113–119.

Minino, A., Arias, E. and Kochanek, K. (2002). Deaths: Final data for 2000. *National Vital Statistics Report, 50*, 1-119.

Montano, D., Phillips, W., Kasprzyk, D. and Greek, A. (2008). STD/HIV prevention practices among primary care clinicians: Risk assessment, prevention counseling, and testing. *Sexually Transmitted Diseases, 35*, 154–166.

Moore, E. (2014). Human immunodeficiency virus and chlamydia/gonorrhea testing among heterosexual college students: Who Is getting tested and why do some not?. *Journal of American College Health*, *61*(4), 196-202.

Morin, S., Sengupta, S. and Cozen, M. (2002). Responding to racial and ethnic disparities in use of HIV drugs: Analysis of state policies. *Public Health Reports, 117*, 263–272.

Morin, S., Koester, K., Steward, W., Maiorana, A., McLaughlin, M. and Myers, J. (2004). Missed opportunities: Prevention with HIV-infected patients in clinical care settings. *Journal of Acquired Immune Deficiency Syndromes*, *36*(4), 960–966.

Msisha, W., Kapiga, S. and Earls, F. (2008). Place matters: Multilevel investigation of HIV distribution in Tanzania. *AIDS, 22*(6), 741-748.

Mullen, P., Ramirez, G., Strouse, D., Hedges, L. and Sogolow, E. (2002). Meta-analysis of the effects of behavioral HIV prevention interventions on the sexual risk behavior of sexually experienced adolescents in control studies in the United States. *Journal of Acquired Immune Deficiency Syndromes, 30*(Supplement 1), S94-S105.

Myers, J., Steward, W., Charlebois, E., Koester, K., Maiorana, A., and Morin, S. (2004). Written clinic procedures enhance delivery of HIV ‘‘Prevention With Positives’’ counseling in primary health care settings. *Journal of Acquired Immune Deficiency Syndromes, 37*(Supplement. 2), S95–S100.

Myers, J., Modica, C., Dufour, M., Bernstein, C. and McNamara, K. (2009). Routine rapid HIV screening in six community health centers serving populations at risk. *Journal of General Internal Medicine, 24*(12), 1269-1274.

National Association of Community Health Centers. (2012). America’s health centers fact sheet. Retrieved from http://www.nachc.com/client/documents/America'sHealthCenters.pdf.

National Poverty Center. (2012). Poverty in the United States. Retrieved from http://www.npc.umich.edu/poverty/.

Nunn, A., Zaller, N., Cornwall, A., Mayer, K., Moore, El, Dickman, S., Bechwith, C. and Kwakwa, H. (2011). Low perceived risk and high HIV prevalence among a predominately African American population participating in Philadelphia’s rapid HIV testing program. *AIDS Patient Care and STDs, 25*(4), 229 – 235.

Office of Inspector General. (2013a). HIV testing in HRSA-funded health center sites. Retrieved from http://oig.hhs.gov/oei/reports/oei-06-10-00290.asp.

Office of Inspector General. (2013b). HIV testing in HRSA-funded health center sites. [Dataset].

Olshefsky, A., Zive, M., Scolari, R. and Zuniga, M. (2007). Promoting HIV risk awareness and testing in Latinos living on the US-Mexico border: The Tu No ME Concoces social marketing campaign. *AIDS Education and Prevention*, *19*(5), 422-435.

Parham, D. and Conviser, R. (2002). A brief history of the Ryan White CARE Act in the USA and its implications for other countries. *AIDS Care: Psychological and Socio-medical Aspects of AIDS/HIV, 14*(Supplement 1), 3-6.

Parker, L, Maman, S., Pettitfor, A., Chalachala, J., Edmonds, A., Golin, C., Moracco, K., and Behets, F. (2013). Barriers to provider-delivered sexual behavior counseling for youth living with HIV/AIDS in the Democratic Republic of the Congo. *Journal of HIV/AIDS Social Services, 12*(3-4).

Partridge, D., Collini, M. and McKendrick, M. (2009). HIV testing: The boundaries. A survey of HIV testing practices and barriers to more widespread testing in a British teaching hospital. *International Journal of STDs and AIDS, 20*, 427-428.

Pathela, P., Hajat, A., Schillinger, J., Blank, S., Sell, R. and Mostashari, F. (2006). Discordance between sexual behavior and self-reported sexual identity: A population-based survey of New York City men. *Annals of Internal Medicine, 145*, 416–425.

Patient Protection and Affordable Care Act, 42 U.S.C. § 18001 et seq. (2010).

Patterson, K., Leone, P. and Fiscus, S. (2007). Frequent detection of acute HIV infection in pregnant women. *AIDS, 21*, 2303–2308.

Paxton, K., Williams, J., Bolden, S., Guzman, Y. and Harawa, N. (2013). HIV risk behaviors among African American women with at-risk male partners. *Journal of AIDS and Clinical Research, 4*(7), 221.

Pescosolido, B. (1991). Illness careers and network ties: A conceptual model of utilization and compliance. *Advances in Medical Sociology, 2*, 164-184.

Pescosolido, B. (1992). Beyond rational choice: The social dynamics of how people seek help. *American Journal of Sociology, 97*, 1096-1138.

Pescosolido, B., Gardner, C. and Lubell, K. (1998). How people get into mental health services: Stories of choice, coercion, and “muddling through” from “first-timers.” *Social Science and Medicine, 46*(2), 275-286.

Petroll, A., and Mosack, K. (2011). Physician awareness of sexual orientation and preventive health recommendations to men who have sex with men. *Sexually Transmitted Diseases, 38*, 63–67.

Phillips, K., Morrison, K., Andersen,R. and Aday, L. (1998). Understanding the context of healthcare utilization: Assessing environmental and provider-related variable in the behavioral model of utilization. *Health Services Research*, *33*(3), 571 – 596.

Phillips, K. and Fernyak, S. (2000). The cost-effectiveness of expanded HIV counseling and testing in primary care settings: A first look. *AIDS, 14*, 2159-2169.

Pilcher, C., Eron, J., Galvin, S., Gay, C. and Cohen, M. (2004). Acute HIV revisited: New opportunities for treatment and prevention. *Journal of Clinical Investments, 113*, 937-945.

Pinkerton, S., Bogart, L., Howeton, D., Snyder, S., Becker, K.. and Asch, S. (2010). Cost of rapid HIV testing at 45 U.S. hospitals. *AIDS Patient Care and STDs, 247*, 409- 413.

Prentice, J. (2006). Neighborhood effects on primary care access in Los Angeles. *Social Science and Medicine, 62*, 1291–1303.

Pringle, K., Merchant, R. and Clark, M. (2013). Is self-perceived HIV risk congruent with reported HIV risk among traditionally lower HIV risk and prevalence adult emergency department patients? Implications for HIV testing. *AIDS Patient Care STDs, 27*(10), 573-584.

Prost, A., Chopin, M., McOwan, A., Elam, G., Dodds, J. and Macdonald, N. (2007). “There is such a thing as asking for trouble’’: Taking rapid HIV testing to gay venues is fraught with challenges. *Sexually Transmitted Infections, 83*(3), 185–188.

Pulerwitz, J., Amaro, H., De Jong, W., Gortmaker, S. and Rudd, R. (2002). Relationship power, condom use and HIV risk among women in the USA. *AIDS Care, 14*, 789–800.

Qaseem, A., Snow, V., Shekelle, P., Hopkins, Jr., R. and Owens, D. (2009). Screening for HIV in health care settings: A guidance statement from the American College of Physicians and HIV Medicine Association. *Annals of Internal Medicine*, *150*(2), 125-131.

Radcliffe, J., Doty, N., Hawkins, L., Gaskins, C., Beidas, R. and Rudy, B. (2010). Stigma and sexual health risk in HIV-positive African American young men who have sex with men. *AIDS Patient Care STDs, 24,* 493–499.

Ramos, R. and Ferreira-Pinto, J. (2002). A model for capacity-building in AIDS prevention programs. *AIDS Education Prevention, 14*(3), 196-206.

Rohrbach, L., Grana, R., Sussman, S. and Valente, T. (2006). Type II translation: transporting prevention interventions from research to real-world sttings. *Evaluation and the Health Professions, 29(*3), 302-333.

Russell, L., Alexander, D. and Corbo, K. (2000). Developing culture specific interventions for Latinas to reduce HIV high-risk behaviors. *Journal of the Association of Nurses in AIDS Care, 11*, 70-76.

Saleh, L., Operario, D., Smith, C., Arnold, E. and Kegeles, S. (2011). "We're going to have to cut loose some of our personal beliefs": Barriers and opportunities in providing HIV prevention to African American men who have sex with men and women. *AIDS Education and Prevention, 23*(6), 521-532.

Samet, J., Freedberg, K., Savetsky, J., Sullivan, L. and Stein, M. (2001). Understanding delay to medical care for HIV infection: The long-term non-presenter. *AIDS, 15*, 77–85.

Sherr, L., Lopman, B., Kakowa, M., Dube, S., Chawira, G., Nyamukapa, C. and Oberzaucher, N. (2007). Voluntary counseling and testing: Uptake, impact on sexual behavior, and HIV incidence in a rural Zimbabwean cohort. *AIDS*, *21*(7), 851-860.

Shi, L. and Stevens, G. (2004). *Vulnerable populations in the United States*. San Francisco, CA: Josey-Bass.

Singh Setia, M., Quesnel-Vallee, A., Curtis, S. and Lynch, J. (2009). Assessing the role of individual and neighborhood characteristics in HIV testing. Evidence from a population based survey. *Open AIDS Journal*, *3*, 46-54.

Smedley, B., Stith, A. and Nelson, A. (2002). Unequal treatment: Confronting racial and ethnic disparities in health care. Institute of Medicine Report. Washington DC: National Academy Press: 2002.

Stall, R., Hoff, C., Coates, T., Paul, J., Phillips, K., Ekstrand, M. and Diaz, R. (1996). Decisions to get HIV tested and to accept antiretroviral therapies among gay/bisexual men: Implications for secondary prevention efforts. *Journal Of Acquired Immune Deficiency Syndromes And Human Retrovirology: Official Publication Of The International Retrovirology Association*, *11*(2), 151-160.

Steward, W., Koester, K., Myers, J. and Morin, S. (2006). Provider fatalism reduces the likelihood of HIV-prevention counseling in primary care settings. *AIDS and Behavior, 10*(1), 3–12.

Stith, S., Pruitt, I., Dees, J., Fronce, M., Green, N. and Som, A. (2006). Implementing community-based prevention programming: A review of the literature. *Journal of Primary Prevention, 27*, 599-617.

Striley, C., Stiffman, A. and Spitznagel, E. (2003). Functioning mediates between symptoms and provider assessment. *Mental Health Services Research, 5*(3), 155-171.

Stiffman, A., Cheng, L., Chen, Y. and Dore, P. (1995). *Social workers as gatekeepers of mental health services for teens.* Paper presented at the American Public Health Association 122nd Annual Meeting, Washington, DC.

Stiffman, A., Chen, Y., Elze, D., Dore, P. and Cheng, L. (1997). Adolescents' and providers' perspectives on the need for and use of mental health services. *Journal of Adolescent Health, 21*, 335-342.

Stiffman, A., Catherine, V. Horvath, E. Hadley-Ives, M., Polger, D., Elze, and Pescarino (2001). Organization context and provider perception as determinants of mental health service use. *The Journal of Behavior Health Services and Research, 28*(2), 188-204.

Stiffman, A., Freedenthal, S., Dore, P., Ostmann, E., Osborne, V. and Silmere, H. (2006). The role of providers in mental health services offered to American Indian youths. *Psychiatric Services, 57*(8), 1185-1191.

Stiffman, A., Hadley-Ives, E., Dore, P., Polgar, M., Horvath, V., Striley, C. and Elze, D. (2000). Youths' access to mental health services: The role of providers' training, resource connectivity, and assessment of need. *Mental Health Services Research, 2*(3), 141-154.

Stiffman, A., Pescosolido, B. and Cabassa, L. (2004). Building a model to understand youth service access: The gateway provider model. *Mental Health Services Research, 6*(4), 189- 198.

Sullivan, L. and Fiellin, D. (2010). The case for routine HIV screening and impact of managed care. *American Journal of Managed Care, 16*(Supplement 13), S345-S351.

Tabachnick, B. and Fidell, L. (1996). *Using multivariate statistics.* (5th ed.). Pearson.

Tao, G., Irwin, K. and Kassler, W. (2000). Missed opportunities to assess sexually transmitted diseases in U.S. adults during routine medical checkups. *American Journal of Preventative Medicine, 18*, 109–114.

Taylor, S., Leibowitz, A., Simon P. and Grusky, O. (2006). ZIP code correlates of HIV-testing: A multi-level analysis in Los Angeles. *AIDS Behaviors, 10*(5), 579-586.

Tucker, J., Walensky, R., Yang, L., Yang, B., Bangsberg, D., Chen, X. and Cohen, M. (2012). Expanding provider-initiated HIV testing at STI clinics in China. *AIDS Care: Psychological and Socio-medical Aspects of AIDS/HIV*, *24*(10), 1316-1319.

Turner B., Cunningham, W. andDuan, N. (2000). Delayed medical care after diagnosis in a US national probability sample of persons infected with human immunodeficiency virus. *Archives of Internal Medicine, 160*, 2614– 2622.

UNAIDS. (2013). 2013 UNAIDS Global Report. Retrieved from http://www.unaids.org/en/media/unaids/contentassets/documents/epidemiology/2013/gr2013/UNAIDS_Global_Report_2013_en.pdf.

United States Department of Commerce. (2010). United States Census Bureau. 2010 Census Dataset. http://www.census.gov/

United States Department of Commerce. (2011). United States Census Bureau News: Hispanic Heritage Month 2011: Sept 15–Oct 15. Retrieved from http://www.census.gov/newsroom/releases/pdf/cb11ff-18_hispanic .pdf.

United States Preventative Services Task Force. (2013a). Screening for HIV. Retrieved from at http://www.uspreventiveservicestaskforce.org/uspstf13/hiv/hivfinalrs.htm.

United States Preventative Services Task Force. (2013b). Grade Definitions. Retrieved from http://www.uspreventiveservicestaskforce.org/uspstf/grades.htm.

United States Department of Health and Human Services. (2011). The 2011 HHS Poverty Guidelines. Retrieved from http://aspe.hhs.gov/poverty/11poverty.shtml.

Valera, P. and Taylor, T. (2011). "Hating the sin but not the sinner": A study about heterosexism and religious experiences among black men. *Journal of Black Studies*, *42*(1), 106-122.

VanOss, B. (2003). HIV prevention in the Hispanic community: Sex, culture, and empowerment. *Journal of Transcultural Nursing, 14*, 186–192.

Verhoeven, V., Bovijn, K. and Helder, A. (2003). Discussing STIs: Doctors are from Mars, patients from Venus. *Family Practitioner, 20*, 11–15.

Wagner, J., Tennen, H., Feinn, R. and Finan, P. (2013). Racial discrimination and metabolic control in women with Type 2 Diabetes. *Ethnic Disparities, 23*(4), 421-427.

Wagner, Z., Wu, Y. and Sood, N. (2014). The Affordable Care Act may increase the number of people getting tested for HIV by nearly 500,000 by 2017. *Health Affairs, 33*(3), 378-385.

Walensky, R., Losina, E., Steger-Craven, K. and Freedberg, K. (2002). Identifying undiagnosed human immunodeficiency virus: The yield of routine, voluntary inpatient testing. *Archives of Internal Medicine, 162,* 887–892.

Wawer, M., Gray, R. and Sewankambo, N. (2005). Rates of HIV-1 transmission per coital act, by stage of HIV-1 infection, in Rakai, Uganda. *Journal of Infectious Diseases, 191*, 1403-1409.

Weinhardt, L. (2005). Changing HIV and AIDS-related behavior: Promising approaches at the individual, group, and community levels. *Behavior Modification, 29*(2), 219–226.

Weinstock, H., Dale, M., Linley, L. and Gwinn, M., (2002). Unrecognized HIV infection among patients attending sexually transmitted disease clinics. *American Journal of Public Health, 92*, 280–283.

Weis, K., Liese, A. and Hussey, J. (2009). A routine HIV screening program in a South Carolina community health center in an area of low HIV prevalence. *AIDS Patient Care STDs, 23,* 251–258.

Weiss, J. and Chitalu, N. (2014). HIV prevention in resource limited settings: A case study of challenges and opportunities for implementation. *International Journal of Behavioral Medicine,* Published online, no volume or pages as of current.

Weiser, S., Leiter, K., Bangsberg, D., Butler, L., Percy-de Korte, F., Hlanze, Z., Phaladze, N., Iacopino, V. and Heisler, M. (2007). Food insufficiency is associated with high-risk sexual behavior among women in Botswana and Swaziland. *PLOS* Medicine, 4(10).

Williams, D. (2003). Race, health, and health care. *St. Louis University Law Journal*, *48*, 13-35

Williams, D. (1999). Race, socioeconomic status, and health. The added effects of racism and discrimination. *Annals of New York Academy of Sciences, 896,* 173-188.

Williams, D. and Jackson, P. (2005). Social sources of racial disparities in health*.* *Health Affairs, 24,* 325-334.

Wilson, S., Lipsey, M. and Derzon, J. (2003). The effects of school-based intervention programs on aggressive behavior: A meta-analysis. *Journal of Consulting and Clinical Psychology, 71*, 136-149.

Wimberly, Y. and Moore, S. (2003). Sexual history taking should be taught in medical school. *American Family Physician, 68*(2), 223.

Wimberly, Y., Hogben, M., Moore-Ruffin, J., Moore, S. and Fry-Johnson, Y. (2006). Sexual history-taking among primary care physicians. *Journal of the National Medical Association, 98,* 1924–1929.

Worth, D. (1990). Minority women and AIDS: Culture, ace, and gender. In D. A. Feldman (Ed), *Culture and AIDS* (pp. 111-135). New York: Praeger.

Wright, J., Neugut, A., Wilde, E., Buono, D., Malin, J., Tsai, W. and Hershman, D. (2011). Physician characteristics and variability of erythropoiesis-stimulating agest use among Medicare patients with cancer. *Journal of Clinical Oncology*, *29*, 3408-3418.

Wright, R., LeBlanc, A. and Aneshensel, C. (1995). Support service use by persons with AIDS and their caregivers. *AIDS Care, 7*, 509-520.

Wyatt, G. (1994). The sociocultural relevance of sex research: Challenges for the 1990s and beyond. *American Psychologist*, *49*, 748-754.

Yang, B., Chan, S., Mohammad, N., Meyer, J., Risser, J. and Chronister, K. (2010). Late HIV diagnosis in Houston/Harris County, Texas, 2000–2007. *AIDS Care, 22*(6), 766–74.

Zierler, S. and Krieger, N. (1997). Reframing women's risk: Social inequalities and HIV infection. *Annual Review of Public Health*, *18*, 401-436.

Zierler, S., Krieger, N., Tang, Y., Coady, W., Siegfried, E., DeMaria, A. and Auerbach, J. (2000). Economic deprivation and AIDS incidence in Massachusetts. *American Journal of Public Health*, *90*, 1064-1073.