

**THE ASSOCIATION OF ORGANIZATIONAL CHARACTERISTICS,
POLICY FACTORS, AND SOCIAL CLIMATE WITH DELIVERY OF
POPULATION-SPECIFIC SUBSTANCE USE TREATMENT**

by

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A dissertation submitted to Johns Hopkins University
in conformity with the requirements for the degree of Doctor of Philosophy

Baltimore, Maryland
January 2015

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ABSTRACT

Objective. To investigate the impact of organizational characteristics, state and federal policies, and social climate on the provision of services designed to meet the needs of specific patient populations in substance use treatment.

Methods. The primary data source was the National Survey of Substance Abuse Treatment Services (NSSATS). Multilevel logistic regression was used to estimate the association of organizational and policy factors with provision of services designed specifically for adult women, adult men, adolescents, seniors, individuals at-risk for HIV, HIV positive individuals, and lesbians, gays, and bisexuals (LGBs). Social climate was also included in models of HIV-related and LGB services.

Results. Organizational characteristics, policy factors, and social climate were all associated with provision of specialized services, although the direction and size of these associations varied across services. Medicaid acceptance and non-profit status were associated with provision of specialized services for women, adolescents, and persons with HIV. Services for LGBs and seniors were more likely to be provided in for-profit centers and those accepting private insurance and Medicare, respectively. Facilities in rural areas and those with religious affiliation were less likely to offer services for women and persons with HIV, while those providing mental health services were more likely to offer services for LGBs and persons with HIV.

Increased state Medicaid spending on treatment was associated with increased provision of gender-based services and services for seniors, while state Medicaid coverage of outpatient treatment was associated with provision of age-based services. In addition, state HIV-designation by the Substance Abuse and Mental Health Services Administration significantly increased odds of provision of HIV-related services. Negative social climate was strongly associated with

facilities providing only HIV prevention services as opposed to offering services for HIV-positive individuals. Negative social climate was also marginally associated with not providing services for LGBs.

Conclusion. There is variation in the impact of organizational characteristics on delivery of treatment services for specific patient populations. Negative social climate appears to significantly impede delivery of services for individuals with HIV and LGBs. The impact of state and federal policies suggests their expansion may serve as a solution for increasing provision of these services.

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ACKNOWLEDGMENTS

I am grateful to my advisor, Leiyu Shi, for the guidance he has provided throughout the development of this dissertation. His feedback was always timely, highly relevant, and supportive. I would also like to thank the faculty members that served on my preliminary oral exam, thesis advisory, and final defense committees: Jill Marsteller, Danielle German, Pierre Alexandre, Ann Skinner, and Susan Sherman. Their suggestions and advice were thoughtful and helped me produce a higher quality dissertation.

I would also like to acknowledge the funding support I received for my doctoral studies, which included the Agency for Healthcare Research and Quality (AHRQ) National Research Service Award (NRSA) training grant #T32HS000029 and additional scholarship support from the Department of Health Policy and Management (HPM) at the Johns Hopkins Bloomberg School of Public Health (JHSPH). I am also grateful from the support and encouragement I received from my fellow doctoral students and HPM staff. The reassuring advice and empathy of my peers at JHSPH has been invaluable throughout. The support of HPM staff members, including Judy Holzer and Mary Sewell, has also been essential to my success as a student and researcher.

I would also like to extend special thanks to Laura Herrera for her mentorship, the opportunities she has given me, and for being flexible with me as I balanced my professional and academic responsibilities. Special thanks also go to my college mentor Jay Barth for inspiring me in my most formative years and for providing me with so many defining opportunities that put me on the path toward graduate studies and a career in health policy.

Finally, I am thankful for my amazing family, friends, and loved ones. I am forever grateful to my parents, Frank and Terry Montgomery, for always encouraging me and giving me the freedom to pursue a career for which I am so passionate and to my brother Rob and his family

for their support. Additionally, this dissertation would have never come to fruition without the love and devoted support of Duncan Olsen and the loyal friendship of Chad Sardashti and David Kolovson. I am very fortunate to have these wonderful people in my life. This dissertation is dedicated to all of you.

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CHAPTER 1: INTRODUCTION

Substance use¹ treatment is most effective when it is specially designed to address the unique risk factors and substance use patterns of various patient populations, such as women, adolescents, persons with HIV, and sexual minorities. However, treatment services aimed at specific populations are not widely available across the United States, and little is known about what factors contribute to treatment centers' decisions to provide these services. This dissertation investigates organizational, policy, and social factors as predictors of the provision of population-specific substance use treatment services. First, organizational characteristics and policy factors are considered for the provision of gender- and age-based treatment services. Next, these factors are considered for the provision of services for populations historically facing stigma and discrimination in health care settings – persons with HIV and lesbians, gays, and bisexuals (LGBs)² – alongside measures of negative social climate towards these populations. The results will help improve understanding of the impact of organizational factors and state and federal policies on the delivery of these substance use treatment services while identifying how negative perceptions of certain populations may impede service provision, which has implications for substance use treatment and health care delivery more broadly.

BACKGROUND AND SIGNIFICANCE

In its landmark study “Crossing the Quality Chasm,” the Institute of Medicine (IOM) describes six aims for improving health care quality. One of these aims is “patient-centeredness,” defined as “providing care that is respectful of and responsive to individual patient preferences,

¹ This study uses the term ‘substance use’ instead of ‘substance abuse’, ‘drug abuse’, or other common terms. Use of the term ‘substance use’ in this thesis assumes that a patient presenting for substance use treatment has use patterns that constitute a ‘substance use disorder’ as defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM), Fifth Edition.

² While often grouped with LGBs in discussions of sexual minorities, transgender individuals are not considered alongside LGBs in this study due to lack of available data and the significant differences in their substance use patterns, treatment needs, and level of discrimination in health care settings.

needs, and values, and ensuring that patient values guide all clinical decisions” (Institute of Medicine, 2001). Patient-centered care is especially important in the area of substance use treatment. As noted in Healthy People 2020, “substance use is strongly influenced by interpersonal, household, and community dynamics” (Department of Health and Human Services [HHS], 2012a).

Predictors of substance use differ across gender, age, sexual orientation, and other demographic characteristics (Galea, Nandi, & Vlahov, 2004), and some substance use treatment facilities offer specialized services designed specially for these populations, increasing the provision of patient-centered care. According to the Substance Abuse and Mental Health Services Administration (SAMHSA) (2005), these specialized services provide “rewarding and therapeutic benefits like affiliation, confrontation, support, gratification, and identification.” Or as the IOM states in its report on quality in substance use and mental health treatment, “seeing or visualizing those similar to oneself successfully performing activities typically increases one’s belief in one’s own ability to perform those activities successfully and facilitates successful management” of a patient’s condition. (Institute of Medicine, 2005). Indeed, specialized services for women (Niv & Hser, 2007), adolescents (Tanner-Smith, Wilson, & Lipsey, 2013), seniors (Kashner, Quinn, Thomas, & Mullen, 1992), persons with HIV (SAMHSA, 2000), and LGBs (Senreich, 2010a; Senreich, 2010b) have been shown to be more effective than treatment aimed at a broader population.

While these services have proven effective, little research has been conducted to identify the factors that are associated with their provision. Previous studies indicate that organizational and policy factors are predictors of the provision of a wide range of services in treatment facilities, but these factors have not been considered for the delivery of services designed specifically for various patient populations. Moreover, survey research strongly suggests that persons with HIV and the LGB community face significant discrimination in health care settings

(Lambda Legal, 2010), but negative perceptions of these populations has never been considered as a predictor of the delivery of substance use treatment services – or any health care service – specially designed for these populations. There is a significant need for the consideration of these factors together to understand their relative influence on delivery of these substance use treatment services, and the inclusion of social climate has implications for health care delivery to persons with HIV, LGBs, and marginalized populations more broadly.

LITERATURE REVIEW

A scoping literature review was conducted to understand the current state of research, identify key factors for inclusion in analyses, and provide a theoretical foundation for the study hypotheses. The review focused on several types of factors – organizational, policy, and social – of relevance to the patient populations considered in this study. The primary search vehicle was PubMed, and several keywords were employed, including: *organizational factors*, *policy factors*, *stigma*, and *discrimination*, as well as *substance use treatment* services preceded by various terms including *gender*, *women-only*, *age*, *adolescent-only*, *senior-only*, *HIV*, *gay*, *lesbian*, *LGBT*, and *sexual minority*. Article titles and abstracts were reviewed and those of potential interest were selected for in-depth review. The bibliographies of located articles were also reviewed for additional references. The search was continued until the articles identified became redundant and key investigators become familiar. The grey literature, including governmental reports from SAMHSA and other agencies, was consulted for additional background.

Effectiveness of Services Designed for Specific Populations

Meta-analyses of existing research have concluded that substance use treatment is effective at reducing future substance use, (Prendergast, Podus, Chang, & Urada, 2002) as well as improving employment outcomes and income (Wickizer, Campbell, Krupski, & Stark, 2000) and reducing criminal involvement (Prendergast, Podus, Chang, & Urada, 2002). Other studies have found that substance use treatment is cost-effective, with treatment resulting in a greater than 7:1

ratio of societal benefits to costs (Ettner et al., 2006). While significant literature exists on the effectiveness of substance use treatment broadly, this study is most concerned with evidence that treatment services and/or programs designed specially for individual patient populations are more effective than broad-based treatment. This section reviews the literature on effectiveness of services designed for patient populations of focus in this study.

Adult Women and Men. A review of literature by SAMHSA (2009c) concluded that same-sex group treatment is more effective than mix-gendered. In a prospective longitudinal study, women-only groups utilized more treatment services and had better drug treatment and legal outcomes than a comparison group of women in mixed-gender groups (Niv & Hser, 2007). Other studies have found positive effects on retention (Zilberman, Tavares, Andrade, & el-Guebaly, 2003) and program completion (Grella & Joshi, 1999). In addition, a study of residential treatment found that programs designed specially to meet the needs of pregnant women and those with young children were cost-effective compared to general residential programs, despite being more expensive (French, McCollister, Cacciola, Durell, & Stephens, 2002).

Qualitative studies have assessed the reasons for better outcomes in a women-only environment. Overall, they point to the increased freedom among women to discuss difficult, gender-related topics such as intimate partner violence and other relationship issues that may be driving substance use (Grosenick & Hatmaker, 2000; Nelson-Zlupko, Dore, Kauffman, & Kaltenbach, 1996; Ravndal & Vaglum, 1994). Others have found that women-only groups provide positive role modeling and create an emotionally safe environment not found in mixed-gender groups. (Bloom & Covington, 1998; Nelson-Zlupko, Kauffman, & Dore, 1995). No studies were found that focused on the effectiveness of men-only substance treatment programs compared to mix-gendered treatment, although mixed-gender treatment has traditionally been designed around male use patterns and needs, perhaps reducing the need for men-only treatment.

Adolescents. In its report on adolescent drug use, the National Institute for Drug Abuse (NIDA) recommends that treatment be “tailored to meet the unique needs of the adolescent,” stating that treatment should consider the patient’s level of psychological development, relationships with family and peers, gender, educational achievement, and community and cultural factors (NIDA, 2014). Similarly, SAMHSA recommends that the “treatment process...address the nuances of each adolescent’s experience, including cognitive, emotional, physical, social, and moral development” (SAMHSA, 1999). A meta analysis of 45 studies of adolescent substance use treatment found that peer group therapy and more individualized therapy that including family members resulted in the greatest reductions in substance use post-treatment (Tanner-Smith, Wilson, & Lipsey, 2013). Another review of studies also found peer support to be a key predictor of successful treatment (Williams & Chang, 2000). Finally, an economic evaluation (French et al., 2007) of family-based, individual, and group cognitive behavioral approaches for adolescents found significant differences in treatment costs and outcomes. Family therapy resulted in significantly better outcomes, while group and individual showed positive but smaller outcomes. Given it was least expensive, group treatment was most cost-effective overall.

Seniors. Among older adults, substance use is often tied to depression and poor mental health related to financial strain and social isolation (Shaw, Agahi, & Krause, 2011; Simoni-Wastila & Yang, 2006). SAMHSA recommends that age-specific treatment for older adults should be sensitive to these economic and social triggers of substance use (SAMHSA, 2008). While there are few studies of specialized services for seniors, there is evidence that it improves compliance and treatment outcomes (Kashner, Quinn, Thomas, & Mullen, 1992; Kofoed, Tolson, Atkinson, Toth, & Turner, 1987).

Persons with HIV. Integrated treatment for substance use and HIV has been identified as a best practice. A SAMHSA Treatment Improvement Protocol (TIP) states that “treatment for

substance use and HIV/AIDS should reflect the interconnected relationship they share and be coordinated as much as possible to maximize care” (SAMHSA, 2000). The TIP also states that HIV prevention services are essential for all substance use treatment settings, while integrated early intervention services, such as post-test counseling and ongoing follow-up for those diagnosed with HIV, are effective in increasing adherence, improving health over the long-term, and reducing rates of transmission (Hodgson, 1999; Gibson, McCusker, & Chesney, 1998). SAMHSA also recommends peer-based treatment support groups and group treatment services as effective treatment options for persons with HIV for their similar positive impact on health status over the long-term (SAMHSA, 2000).

LGBs. SAMHSA states that LGB-sensitive treatment, which has some level of focus on LGB issues, and LGB-affirming treatment, which is designed specifically for LGBs, are best practices for treating substance use in these populations (SAMHSA, 2009a). One study (Senreich, 2010b) found that LGB patients receiving treatment program designed for LGB individuals had significantly higher rates of abstinence after completion of the treatment compared to LGB clients who were not in a specialized treatment. The same researcher also found that gay and bisexual men in traditional treatment were less likely to complete their treatment programs than heterosexual men and gay and bisexual men in specialized programs (Senreich, 2010a). Among those leaving treatment across the three groups, gay and bisexual men in traditional programs were more likely to have left treatment reportedly because their needs were not being met. The study also found that gay and bisexual men in specialized treatment programs had more favorable results for four variables in the perception of treatment including therapeutic support, honesty and openness, feelings of connection and satisfaction of treatment than gay/bisexual men in traditional treatment programs. No studies were found that specifically assessed treatment outcomes for lesbians and bisexual women in specialized treatment, although SAMHSA (2009a)

highlights the significant need for these populations given the interaction between gender-related risk factors and use patterns with sexual orientation.

Organizational Factors

Profit-Status. The profit-status of substance use treatment facilities is associated with the quantity and types of services provided, with public and non-profit facilities generally providing more supplemental and wrap-around services (Ducharme, Mello, Roman, Knudsen, & Johnson, 2007). Patients in public and non-profit centers have longer individual sessions than those in for-profit centers (Wheeler, Fadel, & D'Aunno, 1992). Public centers provide more individual therapy as a percent of total services provided compared to non-profit and for-profit centers (Wheeler, Fadel, & D'Aunno, 1992). Public and non-profit centers are more likely to provide primary care and mental health services (Friedmann, Alexander, & D'Aunno, 1999), medical care and case management services, (Montoya, 2006) and access to newly released pharmacotherapies (Knudsen, Roman, & Oser, 2010) than private centers. They are also more likely to offer wrap around services such as transportation, employment assistance, child care, social activities, and health education (Montoya, 2006). Finally, public and non-profit centers are more likely to provide culturally competent services for racial and ethnic minorities, defined by having staff of racial composition similar to the surrounding geographic area, availability of single-race group therapy, staff trained to work with minorities, and related factors (Howard, 2003a; Howard, 2003b).

On the other hand, for-profit centers are more likely than public and non-profit centers to offer “treatment on demand,” which is being seen within 48 hours or less (Friedmann, Lemon, Stein, & D'Aunno, 2003). They also provide longer group sessions than public and non-profit centers (Wheeler, Fadel, & D'Aunno, 1992). However, they are more likely to turn patients away (Montoya, 2006; Friedmann, Lemon, Stein, & D'Aunno, 2003) and less likely to provide support services such as testing for HIV and other sexually transmitted infections (STIs), HIV education,

counseling, and support, and special assistance to victims of domestic violence (Olmstead & Sindelar, 2004).

Health Insurance Acceptance. Insurance acceptance by facilities is also associated with service provision. Managed care has been found to reduce the use of inpatient substance use care (Steenrod, Brisson, McCarty, & Hodgkin, 2001) and to reduce costs in both the public (McCarty & Dilonardo, 2003) and private providers (Sturm, 2000). At the same time, having a higher percentage of patients in managed care is associated with turning more patients away (Friedmann, Lemon, Stein, & D'Aunno, 2003), offering fewer health education and preventive services, and providing less medical testing for HIV and other STIs (Wells, Lemak, & D'Aunno 2006; Olmstead, White, & Sindelar, 2004). On the other hand, every 10 percentage point increase in revenue coming from publicly-financed managed care is associated with a 10% increase in the odds of offering partial hospitalization and non-hospital inpatient care, controlling for other facility-level factors (Chuang, Wells, & Alexander, 2011). Percentages of revenue coming from private insurance – either managed care or traditional fee-for-service – and self-paying clients is associated with decreased odds of offering transportation and housing assistance (Chuang, Wells, & Alexander, 2011).

Acceptance of Medicaid has been shown to have significant effects on services provided in substance use treatment facilities, which is not surprising given Medicaid's significant role in the overall financing of substance use treatment in the U.S. (Buck, 2011). In all facilities – regardless of being private, non-profit, or government-run – Medicaid acceptance is associated with increased odds of offering discharge planning and social service linkages (McBride, Chiqui, Terry-McElrath, & Malatu, 2012). In for-profit and non-profit facilities, acceptance of Medicaid patients is also associated with increased odds of provision of child care services and transportation assistance, as well as increased odds of offering housing assistance in for-profit facilities and case management services at non-profit facilities (McBride, Chiqui, Terry-

McElrath, & Malatu, 2012). However, serving a greater percentage of patients with Medicaid is also associated with increased likelihood of turning patients away (Friedmann, Lemon, Stein, & D'Aunno, 2003).

Resources and Size. Not surprisingly, the financial resources and patient volume of a facility are associated with service provision. Regardless of types of payment accepted, facilities with higher profit margins are more likely to provide supplemental services (Durkin, 2002). Larger facilities with greater numbers of clients are much more likely to offer support groups and different treatment tracks, including tracks for patients with HIV (Abraham, O'Brien, Bride, & Roman, 2011).

Religious Affiliation. There is some evidence that religious-affiliated treatment programs offer different types of services and treatment orientations than traditional programs. One study found that religiously affiliated programs are more likely to have a 12-step orientation in goals and activities, while non-religious programs were more likely to provide cognitive behavioral therapy as part of treatment (McIlwraith, Kinner, & Najman, 2011). A separate study that religiously affiliated programs were more likely to be targeted at men, although the study only considered treatment centers that offered residential services. The study also found that staff in religiously affiliated programs were more focused on "structure and discipline" than readiness to enter the workforce (Neff, Shorkey, & Windsor, 2006).

Accreditation. Various organizations have accreditation programs that require facilities to meet a given set of standards regarding their service provision. Joint Commission accreditation is associated with increased provision of mental health services (Friedmann, Alexander, & D'Aunno, 1999) and physical examinations and routine medical care (Durkin, 2002) compared to non-Joint Commission-accredited treatment facilities. When states tie their licensure of substance use treatment facilities to national accreditation programs such as the Joint Commission's— as

opposed to their own internal licensure – facilities are more likely to offer group-based counseling services. However, facilities in states using their own accreditation programs not tied to national accreditation programs were more likely to offer wrap-around social services such as employment assistance, child care assistance, and transportation assistance (Chriqui, Terry-McElrath, McBride, Eidson, & VanderWall, 2007).

Policy Factors

More than half of all substance use treatment received in the U.S. is funded by public sources, including Medicaid and federal-to-state block grants from SAMHSA, and this percentage is increasing as a result of the Patient Protection and Affordable Care Act (ACA) (Buck, 2011). A review of the literature found no studies assessing the relationship between state and federal health policies and provision of specialized substance use treatment services for specific patient populations. However, evidence does suggest that changes to Medicaid policy and public spending on substance use treatment result in changes in service provision in treatment facilities, although the literature in this area is scant. Nonetheless, the limited findings are relevant for understanding how federal and state policy decisions may impact treatment centers' decision-making on service provision and for generating hypotheses for this study.

Medicaid Policy. Medicaid has played an increasingly large role in financing access to substance use services as private coverage has decreased over time (Buck, 2011; Mark, Levit, Vandivort-Warren, Coffey, & Buck, 2007). For this reason, changes in Medicaid coverage for substance use treatment services can have a major impact on access to specific treatment services. While no studies have assessed the impact of coverage changes on provision of specialized services for specific populations, a few studies have identified the impact on coverage changes more generally. Oregon had provided coverage for substance use treatment services in its Medicaid program, but decided to remove coverage for beneficiaries covered under a section 1115 waiver expansion due to budget constraints. A study of opiate-addicted patients found that

patients presenting for Medicaid-funded treatment after the removal of coverage were less than half as likely to be placed in a treatment program compared to before the removal of coverage (Deck, Wiitala, & Laws, 2006). In addition, patients with no recent treatment history were less likely to receive treatment after the benefit change. The study also found that client counts were significantly reduced and many non-profit treatment centers closed, reducing access to treatment services for non-Medicaid patients (Deck, Wiitala, & Laws 2006).

On the other hand, certain Medicaid policy decisions have resulted in increased access to evidence-based care. A study comparing managed care and fee for service Medicaid beneficiaries in Maryland found that managed care patients were more likely to receive outpatient-only treatment as opposed to residential and had long and more intensive treatment episodes than fee-for service beneficiaries, resulting in better outcomes (Ettner et al., 2003). Another study found that facilities in states with a Medicaid behavioral health carve-out are more likely to provide intensive outpatient services (Chuang, Wells, & Alexander, 2011), which entail longer sessions and include relapse prevention education, skill development, group sessions, and medication management (SAMHSA, 2006). In addition, Medicaid policies encouraging use of generic drugs on preferred drug lists and formularies is associated with increased odds of pharmacotherapy treatment adoption in treatment centers (Heinrich & Hill, 2008).

Public Funding. Outside of Medicaid, a large portion of treatment is funded by federal-to-state block grants from SAMHSA, as well as direct spending by state and local governments (Buck, 2011). These funding sources together account for about half of total public spending on substance use treatment (Mark, Levit, Vandivort-Warren, Coffey, & Buck, 2007). Given the allocation formulas used by SAMHSA, block grant funding is relatively evenly allocated across states based on level of patient need (SAMHSA, 2014a). While SAMHSA does place some conditions on how states use the block grant funding, the agency has limited ability to track spending. As a result, states have considerable latitude in making funding decisions, and there

have been questions in the past about whether or not grant funds have been directed away from substance use treatment to fund other state programs. However, studies have generally found that nearly all block grant funding is accounted for in state substance use treatment spending (Cowell, McCarty, and Woodward, 2003). SAMHSA has placed some stricter requirements on how states spend block grant funding, including requiring states with high prevalence of HIV to spend at least five percent of funds on treatment services for individuals with HIV (SAMHSA, 2014c) and all states to devote at least five percent for services for pregnant women and women with dependent children (SAMHSA, 2014d). No studies were found that directly tied SAMHSA block grant funding amounts to delivery of specific treatment services. One study was found, however, that assessed the effect of state funding levels on provision of pharmacotherapies. It found that an additional \$1,000 in per-capita state expenditures was associated with about 100 percent increased odds of adopting naltrexone (Heinrich & Hill, 2008).

Social Factors

Race/Ethnicity. There is evidence that having a greater percentage of racial/ethnic minority clients is associated with provision of more extensive services. Treating an increasing percentage of African American clients is associated with increased likelihood of offering physical exams, mental health services, services for multiple drug use, and legal counseling (D'Aunno & Vaughn, 1995). Increased numbers of Hispanic clients is associated with increased provision of services for multiple drug use and legal counseling only (D'Aunno & Vaughn, 1995). Facilities are 20 percent more likely to offer HIV testing for every ten percentage point increase in the percent of patients that are African-American and five percent more likely to offer testing for every ten percentage point increase in patients that are intravenous drug users (IDU) (Abraham, O'Brien, Bride, & Roman, 2011). Facilities serving greater numbers of racial/ethnic minorities were also more likely to have onsite HIV support groups and treatment tracks (Abraham, O'Brien, Bride, & Roman, 2011).

Socioeconomic Status (SES). The SES of the geographic area surrounding treatment centers has been associated with substance use service provision. Higher per capita income in the geographic area surrounding a facility is associated with provision of health education, preventive, and outreach services. For every \$1,000 increase in county per capita income, a treatment center was about five percent more likely to offer these services (Wells, Lemak, & D'Aunno, 2006).

LGB Discrimination. Despite more significant health care needs – especially in the areas of mental health and substance use – LGBs have more restricted access to health care services than heterosexuals (Kaiser Family Foundation, 2014). A limited number of studies have assessed how LBG status impacts an individual's interactions with the health care system, although the quality of these studies is lacking in some cases due to limitations with data sources.

A 2009 survey of more than 4,000 members of the LGBT community found that a majority had negative experiences with the health care system (Lambda Legal, 2010). About eight percent of LGBs reported that they had been denied needed care because of their sexual orientation. More than 10 percent reported that health care professionals refused to touch them or used excessive precautions, while about 12 percent reported an experience of a health care professional blaming them for their health status. Another 10 percent reported that health care professionals had used harsh or abusive language, while another four percent reported professionals being physically rough or abusive. Overall, 56 percent of LGBs surveyed reported some discriminatory experience in a health care setting.

Another study surveyed urban men who have sex with men (MSM) in the U.S. and found that nearly 30 percent reported having little access to care and were strongly mistrustful of the health system. In addition, those reporting discomfort disclosing their sexuality to their provider were significantly less likely to report regular access to care (McKirnan, DuBois, Alvy, & Jones,

2013). A separate study of older gay men found that 73 percent believed LGB-related discrimination exists in long-term care facilities (Addis, Davies, Greene, MacBride, & Shepherd, 2009). Moreover, in a recent report, SAMSHA (2009a) noted that heterosexism is common in substance use treatment settings in the form of “gay-bashing conversations and cynical remarks and jokes regarding gay sexual behaviors.”

HIV/AIDS Discrimination. There is evidence that stigma manifests into discrimination against people with HIV in health care delivery settings. The Lambda Legal survey (2010) referenced above also asked persons with HIV about their health care experiences, and nearly two-thirds reported experiencing discrimination in health care settings. More than 35 percent reported health care professionals refusing to touch them or using excessive precaution. One in four reported health care professionals blaming them for their health status. About 12 percent reported providers using harsh or abusive language, while about four percent reported providers being physically rough or abusive. An older study found that 26 percent of 2,466 adults with HIV found had experienced discrimination in health care settings, with 8 percent being refused service (Schuster et al., 2005). Multiple studies have found that negative views of persons with HIV are highly attributable to negative perceptions of sexual minorities and specifically men who have sex with men (MSM) (Herek and Capitanio, 1999; Herek 2002; Tomaszewski, 2012).

Providers themselves have reported witnessing HIV-related stigma amongst colleagues. A qualitative study of 39 rural HIV service providers identified stigma against persons dually diagnosed with HIV and substance use (Yannessa, Reece, & Basta, 2008). Primary care providers in the study noted that HIV-positive persons seeking addiction services were turned away from some facilities or upon visiting a facility feeling unwelcome and unable to speak freely about their conditions. Similar results were seen in a random survey of primary care physicians. Providers with lower comfort levels seeing HIV-positive patients were significantly

less likely to accept these patients. Those reporting feeling being uncomfortable with gay patients were significantly less likely to have treated someone with HIV (Shi et al., 1997).

In summation, existing literature suggests that substance use treatment designed specifically for various patient populations results in better outcomes than traditional treatment. Several organizational factors were identified that may influence delivery of these services, including profit-status, insurance acceptance, religious affiliation, accreditation, and organizational resources. Policy factors that may influence service provision include Medicaid coverage and levels of government spending on substance use treatment services. The review also identified race/ethnicity and income as predictors of substance use treatment service provision and found that persons with HIV and LGBs frequently experience discrimination in health care settings.

CONCEPTUAL FRAMEWORK

As noted in the Introduction, this research falls in the area of health care quality and specifically within the area of patient-centeredness. In his work on health care quality, Avedis Donabedian (1988) proposed three health delivery domains as a framework for evaluating health care quality. ‘Structure’ refers to the “settings in which care occurs” and includes contextual factors, material and human resources, and organizational structures. ‘Process’ refers to the “giving and receiving of care,” including the patient’s care seeking and the activities of the health care provider in making diagnoses and providing treatment. Finally, ‘outcome’ refers to the “effects of care on the health status of patients and populations.” The relationships between these domains are such that structure affects process, which in turn affects outcomes.

Donabedian’s health care quality model was modified to include factors identified in the literature review to guide this study. This conceptual framework (Figure 1) presents factors associated with substance use treatment outcomes classified by quality domain (i.e., structure,

process, and outcome). To further characterize these factors, they are also classified by the level at which they exist (i.e., patient, facility, and environment). The proposed research deals exclusively with relationships between structure and process. Aim 1 assesses the relationship between facility and environmental factors (all structure) and delivery of services specifically for broad gender- and age-based patient populations (process). Aims 2 and 3 look specifically at the LGB and HIV populations to assess the degree to which social climate (structure) influences provision of services for these populations relative to other facility and environmental characteristics.

RESEARCH RATIONALE

Existing literature and treatment guidelines generally conclude that specialized substance use treatment services designed to meet the particular treatment needs of various patient populations are more effective than treatment designed for the general population. A limited number of studies have identified organizational and policy predictors of the provision of a range of services in substance use treatment, although very few have been specifically aimed at specialized services for patient populations. As a result, very little is known about how these factors may influence provision of these evidence-based specialized services. Moreover, while surveys have assessed the extent to which persons with HIV and LGBs face discriminatory practices in health care settings, no studies were identified that have considered the extent to which negative perceptions of these populations may influence provider decision-making about service delivery.

The results of these analyses will expand understanding of how organizational characteristics and current state and federal policies influence the provision and availability of evidence-based substance use treatment. They will also estimate the influence of negative social climate towards persons with HIV and LGBs on delivery of effective substance use treatment for this population. These findings will inform state and federal policymakers' strategies to increase

availability of patient-centered substance use treatment for large patient populations as well as smaller, highly vulnerable patient populations, in keeping with various treatment guidelines and best practices identified in the literature.

SPECIFIC AIMS, RESEARCH QUESTIONS, AND HYPOTHESES

The general objective of this thesis is to provide empirical evidence on the extent to which organizational characteristics, state and federal policies, and social climate influence the provision of specialized substance use treatment services for various patient populations. The underlying hypothesis is that these factors create barriers in accessing patient-centered, evidence-based substance use treatment for these populations, and that these factors may influence service delivery for particular groups differently. To that end, this study has three aims, listed below. For each aim, corresponding research questions and hypotheses are presented in Table 1-1.

- *Aim 1:* Investigate the association between organizational factors and state Medicaid policies on provision of gender- and age-based substance use treatment services,
- *Aim 2:* Investigate the association between organizational factors, federal policy, and social climate with provision of HIV-related services in substance use treatment, and
- *Aim 3:* Investigate the association between organizational factors and county- and state-level social climate with provision of specialized services for LGBs in substance use treatment.

DISSERTATION ORGANIZATION

This dissertation utilizes a three-manuscript format and has a total of six chapters. The present chapter contains a literature review that synthesizes the existing research on the effectiveness of population-specific substance use treatment services, organizational and policy factors associated with provision of specific substance use treatment services, and the influence of stigma and discrimination on access to health services for LGBs and persons with HIV. In

addition, this chapter provides a research rationale, the conceptual framework that guided the study, and a summary of study aims, research questions, and hypotheses. Chapter 2 details the research methods utilized in this study, including detailed descriptions of the data source, study variables, and statistical analyses.

Chapters 3, 4, and 5 are separate manuscripts that explore study aims 1, 2, and 3, respectively. As such, they are intended to represent unique studies that could be considered for publication to scientific journals. Since each manuscript is intended to stand alone, some portions of the introduction, methods, and discussion sections are common across the manuscripts and other chapters. Chapter 3 examines the association of organizational and policy factors with provision of treatment services based on gender and age. Chapter 4 examines the association of organizational and policy factors with provision of HIV-related services and includes an additional measure of social climate. Similarly, Chapter 5 examines the association of organizational factors and social climate with provision of services designed specifically for LGBs. Finally, Chapter 6 provides a summary of research findings from Chapters 3, 4, and 5, outlines strengths and limitations of this study, and explores the policy and programmatic implications of the study results.

Figure 1-1. Conceptual Framework

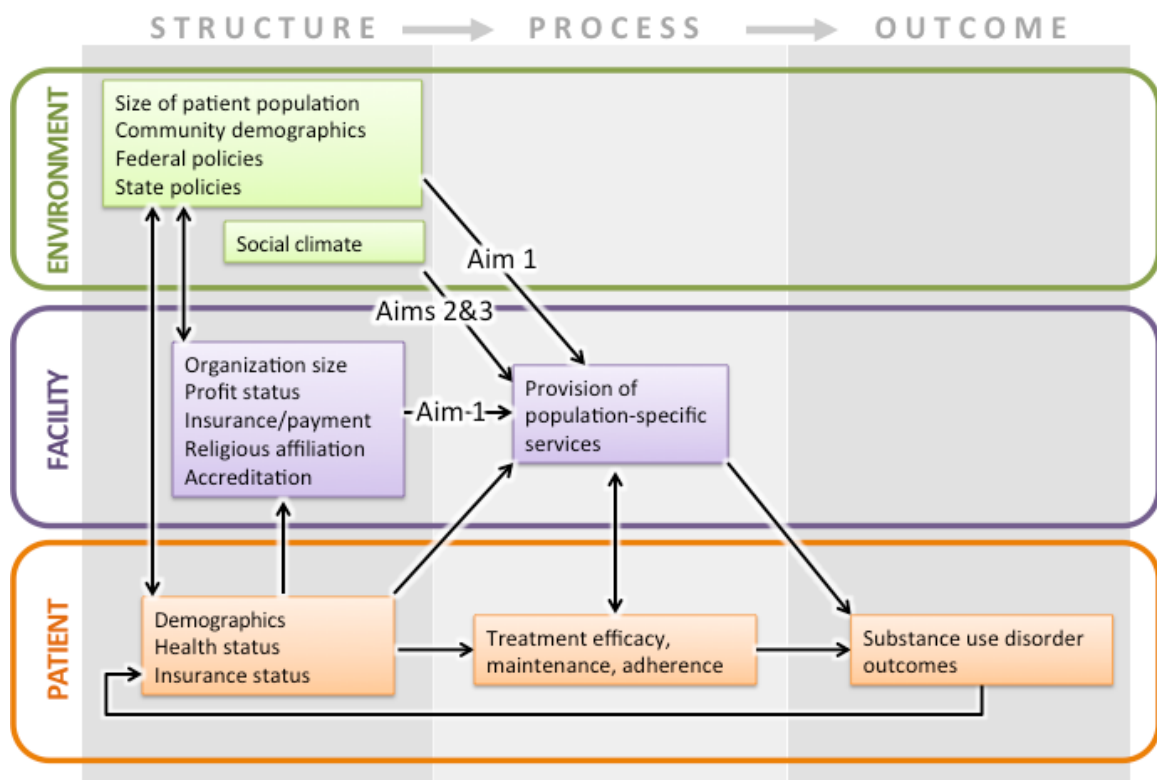


Table 1-1. Study Aims, Research Questions, and Hypotheses	
<i>Aim 1 (Chapter 3):</i> Investigate the association between organizational factors and state policies on provision of gender- and age-based substance use treatment services.	
<i>Research Question 1:</i> Do organizational factors predict provision of gender- and age-based treatment services?	<i>Hypothesis 1:</i> Profit-status, provision of mental health services, type of insurance accepted, religious affiliation, rural location, and accreditation are associated with provision of age- and gender-based services.
<i>Research Question 2:</i> Does state Medicaid spending and coverage predict provision of gender- and age-based treatment services?	<i>Hypothesis 2:</i> State Medicaid spending and coverage is positively associated with provision of age- and gender-based services.
<i>Research Question 3:</i> Are there differences in organizational and Medicaid policy predictors of provision of population-specific services across genders and age groups?	<i>Hypothesis 3:</i> There are differences in organizational and Medicaid policy predictors of services for adult men versus adult women and adolescents versus seniors.
<i>Aim 2 (Chapter 4):</i> Investigate the association between organizational factors, federal policy, and social climate with provision of HIV-related services in substance use treatment.	
<i>Research Question 4:</i> Do organizational factors predict provision of HIV-related services in substance use treatment?	<i>Hypothesis 4:</i> Profit-status, provision of mental health services, type of insurance accepted, religious affiliation, rural location, and accreditation are associated with provision of HIV-related services in substance use treatment.
<i>Research Question 5:</i> Does SAMHSA HIV-designation predict provision of HIV-related services in substance use treatment?	<i>Hypothesis 5:</i> SAMHSA HIV-designation is positively associated with provision of HIV-related services in substance use treatment.
<i>Research Question 6:</i> Does social climate predict provision of HIV-related services in substance use treatment?	<i>Hypothesis 6:</i> Social climate is positively associated with provision of HIV-related services in substance use treatment.
<i>Research Question 7:</i> Are there differences in federal policy and social climate predictors of provision of HIV-related services in substance use treatment for HIV preventive services versus services for HIV positive individuals?	<i>Hypothesis 7:</i> There are differences in federal policy and social climate predictors of provision of HIV-related services in substance use treatment for HIV preventive services versus services for persons infected with HIV.
<i>Aim 3 (Chapter 5):</i> Investigate the association between organizational factors and county- and state-level social climate with provision of specialized services for lesbians, gays, and bisexuals (LGBs) in substance use treatment.	
<i>Research Question 8:</i> Do organizational factors predict provision of specialized services for LGBs in substance use treatment?	<i>Hypothesis 8:</i> Profit-status, provision of mental health services, type of insurance accepted, religious affiliation, rural location, and accreditation are associated with provision of specialized services for LGBs in substance use treatment.
<i>Research Question 9:</i> Does county-level social climate predict provision of specialized services for LGBs in substance use treatment?	<i>Hypothesis 9:</i> County-level social climate is positively associated with provision of specialized services for LGBs in substance use treatment.
<i>Research Question 10:</i> Does state-level social climate predict provision of specialized services for LGBs in substance use treatment?	<i>Hypothesis 10:</i> State-level social climate is positively associated with provision of specialized services for LGBs in substance use treatment.

CHAPTER 2: RESEARCH METHODS

This chapter provides a brief overview of the data sources, study variables, and analytic methods used to address the research questions. More detailed information on the research methods utilized in each of the manuscripts is provided in the subsequent three chapters.

DATA SOURCES

This study is a retrospective, cross-sectional analysis of survey data from substance use treatment facilities, with additional county- and state-level variables derived from the U.S. Census and various other data sources. Appendix A contains a summary of each study variable, including its source, description, and specifications. The primary data source is the 2009 NSSATS, which is an annual census of substance use treatment facilities in the U.S. that is planned and directed by the Center for Behavioral Health Statistics at SAMSHA and fielded by Mathematica Policy Research. The NSSATS includes questions about facility characteristics, patient population, and services offered.

The county- and state-level variables were derived from a variety of sources. Income and race/ethnicity variables were derived from 2010 Census data. County-level estimates of HIV prevalence came from state reports to the Centers for Disease Control and Prevention (CDC). For states not reporting prevalence data to the CDC, estimates were taken directly from state health department reports. Data on Medicaid coverage of outpatient substance use treatment and state expenditures was taken from a federal survey of states released by HHS (2012b). Spending data in the report were projections based on previous years' expenditures. Medicaid enrollment data from the Kaiser Family Foundation were used to create per-capita spending rates. Data on SAMHSA HIV special designation was taken directly from the SAMHSA website. Proxy measures were used to assess social climate at the county- and state-levels. The county-level

Presidential election results were taken from the Atlas of U.S. Presidential Elections and state-level support for gay rights was taken from Lax and Phillips (2009a).

STUDY SAMPLE

In the 2009 survey, a total of 17,226 facilities were part of the universe of the NSSATS, which represents all active U.S. treatment facilities as identified by SAMHSA and state substance abuse agencies. Of these facilities, 2,013 (11.7%) were subsequently determined to be either closed or no longer offer substance use treatment services and were deemed ineligible for the survey. Among the 15,213 facilities that were eligible, 13,513 (88.8%) were included in the survey. Among those not included, 1,004 did not respond for the survey (6.6% of those eligible). Others were not included due to being grouped with other partner facilities. For each study aim, certain facilities were removed from the analytic dataset (see Chapters 3-5).

Facilities are given the choice of mode of response; 58 percent responded via web-based questionnaires, 29 percent via paper questionnaire submitted by mail, and 13 percent via telephone interviews. Non-response on items was reduced through reviews and follow-up. The item response rate was 98 percent across 193 survey items. All mailed questionnaires were manually reviewed for consistency and missing data, and follow-up telephone calls were made to clarify responses and obtain missing information. Imputation was used when facilities could not be reached for follow-up. Automated quality assurance reviews were conducted for all facilities, regardless of mode of response, and manual editing was used where appropriate according to established rules.

STUDY VARIABLES

The following paragraphs provide discussion of the dependent and independent variables included in each study aim, with additional description and justification for the county- and state-

level social climate proxy variables and LGB population variables. f provides details on each variable used in the analysis, including its source, description, and specifications.

Dependent Variables. In Aim 1, there are eight binary dependent variables for provision of gender- and aged-based services. The gender-based service variables are: (1) provision of any gender-based service, (2) provision of specialized services for adult women, (3) provision of specialized services for adult men, and (4) provision of services for adult men only versus adult women only among the subset of facilities offering only one gender-based service. The age-based service variables are: (5) provision of any age-based service, (6) provision of specialized services for adolescents, (7) provision of specialized services for seniors, and (8) provision of services for adolescents only versus seniors only among the subset of facilities offering only one age-based service.

In Aim 2, there are six binary dependent variables for provision of HIV-related services: (1) provision of any HIV-related services, (2) provision of HIV testing, (3) provision of HIV education, (4) provision of early HIV intervention, (5) provision of specialized substance use treatment services for persons with HIV, and (6) provision of HIV prevention services only (HIV testing and/or HIV education) versus provision of any services for persons infected with HIV (early HIV intervention and/or specialized substance use treatment) among the subset of facilities offering any HIV-related service. Finally, *Aim 3* has one dependent variable, which is a binary variable for provision of specialized substance use treatment services for LGBs.

Independent Variables. Independent variables were spread across three levels: facility, county, and state. At the facility-level, variables include volume of patient admissions, provision of mental health services, types of insurance accepted, profit-status, accreditation, and religious affiliation. Inclusion of these organizational characteristics was based on the review of existing literature of substance use treatment service delivery. The county-level variables include 2008

Presidential election results as a proxy for social climate and covariates for SES and race/ethnicity. The state-level variables include Medicaid policy factors—reimbursement for outpatient substance use treatment and per-capita spending on substance use treatment— as well as support for gay rights as a proxy for social climate and covariates for SES and race/ethnicity. The paragraphs below provide a discussion of the social climate proxy measures and LGB population variables.

Social Climate Variables. A state-level measure for social climate was included in Aims 2 and 3, and Aim 3 contains an additional county-level social climate measure. There are very few data sources available that estimate social climate for LGBs. Most surveys assessing views toward LGBs are national and do not have sample sizes large enough to disaggregate to smaller geographic units with precision. Some state-level surveys exist, but are not directly comparable due to differences in survey questions and sampling methodology. Assessing county-level social climate in a comparable manner is even more challenging. For these reasons, proxy measures were used to estimate both state- and county-level social climate.

At the county-level, results from the 2008 presidential election results were used as a proxy. While an imperfect measure of social climate, surveys show that more than two-thirds of Democrats believe homosexuality should be accepted by society, while more than half of Republicans believe it should be discouraged (Pew Research Center for the People & the Press, 2013). Moreover, county-level presidential election results have been used as a proxy for LGB social climate by the Williams Institute, a think tank at the University of California, Los Angeles (UCLA) that conducts research on sexual orientation (Gates, 2013).

At the state-level, estimates of public support for gay rights were used as a proxy, providing a more direct measure of negative views of LGBs. The estimates were derived using multilevel regression and post-stratification (MRP) of data national surveys (Lax & Phillips,

2009a). MRP compensates for small within-state samples by using demographic and geographic correlations for adjustment. All individuals in the survey, regardless of their location, yielded information about demographic patterns that can be applied to all state estimates. The estimates for each demographic-geographic respondent type were then weighted by the percentages of each type in actual state populations to estimate the percentage of respondents within each state who have a particular issue position. The investigators used this method to estimate support for eight different gay rights or policies, including housing non-discrimination, marriage, adoption, and hate crimes. (Lax & Phillips, 2009a), which were averaged for an overall estimate of state support for gay rights. This approach to producing state-level estimates of public opinion has been shown to produce better results than other methods, such as simply disaggregating national polls (Gelman & Little, 1997; Lax & Phillips, 2009b; Park, Gelman, & Bafumi, 2006).

LGB Population Variables. County data on the size of the LGB population were based on U.S. Census data. The Census does not ask respondents questions about their sexual orientation. However, the Census Bureau developed a procedure to estimate the number of same sex couples in each state, and researchers at the Williams Institute at UCLA have used this procedure to estimate the number of same sex couples in each U.S. county (The Williams Institute, 2011). Same-sex couples are identified in households where the respondent describes his or her relationship with another adult of the same sex in the same household as a “husband/wife” or “unmarried partner.” These numbers are then adjusted to account for the likelihood that a small portion of different-sex couples miscode the sex of a spouse or partner and are incorrectly counted as a same-sex couple. These data represent the only available county-level estimates of the size of the LGB population. While this variable only captures same sex couples – excluding single gays and lesbians – the ratio of LGB-identifying couples to LGB-identifying singles should not differ greatly across the U.S. In addition, a state-level measure of the LGB population came from estimates derived from over 200,000 interviews conducted by

Gallup in 2012, in consultation with the Williams Institute (Gates & Newport, 2013). The survey asked if the respondent personally identifies as lesbian, gay, bisexual, or transgender. The margin of error for each state is ± 2 percentage points, except for a slightly larger margin of error for the District of Columbia.

STATISTICAL ANALYSES

All research questions were assessed using cross-sectional analyses of secondary data. Exploratory data analyses were used to assess the quality of the data and the distribution of specific variables, and descriptive characteristics for the study variables were then obtained. This exploratory analysis also included an assessment of the extent to which provision of services for individual patient populations overlapped with service provision for other populations (see Appendix B). A multilevel modeling approach was used in all three study aims to account for the clustering of facilities within counties and counties within states. The facility-level factors are level 1, the county-level factors are level 2, and the state-level factors are level 3 such that facility_{ijk} represents facility *i* in county *j* in state *k*. Models were estimated using maximum likelihood estimations (MLE).

For each study aim, multilevel mixed-effects logistic regression modeling was used to investigate the relationship between the independent variables and provision of specialized services for various populations. Variables were included at the facility-, county-, and state-levels (see Appendix A). For each outcome measure, simple regressions were first conducted to obtain unadjusted associations, then multivariable regressions were conducted to estimate adjusted odds ratios. In the multivariable regressions, random intercepts were included at the county- and state-levels to account for unobserved heterogeneity. Interaction terms were also included to assess potential moderating effects between variables. All analyses were conducted using Stata software, version 13.1 (StataCorp, 2013).

The following model specification has been simplified to include one covariate at each level:

$$Y_{ijk} \sim \text{Bernoulli}$$

$$\text{logit} \{P(y_{ijk} = 1)\} = \beta_0 + \beta_1 X_{1ijk} + \beta_2 X_{2jk} + U_{0j} + \beta_3 X_{3k} + U_{0k}$$

$$X_{1ijk} = \text{facility-level factors}$$

$$X_{2jk} = \text{county-level factors}$$

$$X_{3k} = \text{state-level factors}$$

$$U_{0j} = \text{random intercept for county } j \text{ (level 2)}$$

$$U_{0k} = \text{random intercept for state } k \text{ (level 3)}$$

The usual methods for assessing goodness of fit in regression modeling are not appropriate for multilevel logistic regression. A recent review (Saaid, 2013) of common goodness of fit test statistics in logistic regression analysis found significant shortcomings when used in multilevel logistic models. The Hosmer-Lemeshow test statistic is not recommended for multilevel analyses and is considered to be obsolete by many. The Evans-Hosmer and Sturdivant-Hosmer test statistics, which addressed some of the issues with Hosmer-Lemeshow, are not appropriate with small cluster sizes, which this study has in some instances. Similarly, there is no accepted pseudo R-squared calculation in multilevel logistic modeling. Some have been proposed but have not been widely accepted (Liu, Zumbo, and Wu, 2014).

Indeed, Stata 13.1 will not calculate any of these fit statistics when performing multilevel logistic regression. For these reasons, these statistics are not included in this study. However, Akaike's Information Criteria (AIC) and Bayesian Information Criteria (BIC) were used to compare the fit of different models and select final models. Chapter 5 contains AIC and BIC values for various models of specialized services for LGBs. In addition, AIC and BIC values for the final and alternative models for all three manuscripts are included in Appendices D, E, and F.

ETHICS REVIEW

A study application was submitted to the Johns Hopkins Bloomberg School of Public Health Institutional Review Board on March 29, 2013. This study application was approved and was determined to be “not human subjects research” on April 1, 2013 (see Appendix B). This study exclusively uses publicly available secondary data with information on facilities and geographic areas; these data contain no information could be used to identify individuals.

CHAPTER 3: ASSOCIATION OF ORGANIZATIONAL AND POLICY FACTORS WITH PROVISION OF GENDER- AND AGE-BASED SUBSTANCE USE TREATMENT

INTRODUCTION

Predictors of substance use disorders differ across gender, age, race/ethnicity, education level, and other demographic and socioeconomic characteristics (Galea, Nandi, & Vlahov 2004). These group differences in determinants of substance use suggest that different demographic groups require different treatment approaches, and some substance use treatment centers offer specialized services designed to meet these groups' specific needs. According to SAMHSA (2005), peer-based services provide "rewarding and therapeutic benefits like affiliation, confrontation, support, gratification, and identification." Or, as the IOM states in its report on quality in substance use and mental health treatment, "seeing or visualizing those similar to oneself successfully performing activities typically increases one's belief in one's own ability to perform those activities successfully and facilitates successful management" of the patient's condition (Institute of Medicine, 2005).

While literature suggests that gender- and age-specific substance use treatment effective, little is known about organizational and policy factors that may be related to their provision. This study aims to assess the association of provision of gender- and age-based substance use treatment services with key organizational and policy factors identified in the substance use treatment literature as being predictive of services offered in treatment centers. In addition, the study aims to identify any differences in these factors across genders and age groups.

Gender Differences in Substance Use and Effectiveness of Gender-Based Treatment

At a population level, women and men enter substance use treatment with different problems and needs. While substance use and dependence is more prevalent among men, studies have shown that women typically present with more complex clinical profiles (Greenfield, Back,

Lawson, & Brady, 2010). Substance use in women is more frequently tied to diverse problems at intake, including issues related to psychological health, intimate partner violence, sexual abuse, family problems, and other social issues, while men are more likely to be entering treatment as a result of the actions of an employer or the criminal justice system (Greenfield, Back, Lawson, & Brady, 2010; Grella & Joshi, 1999). In addition, the types of substances used are often different for men and women. Recent surveys indicate that males have relatively higher rates of alcohol, heroin, and marijuana use while women have relatively higher rates of prescription drug and methamphetamine use (Greenfield, Back, Lawson, & Brady, 2010; SAMHSA, 2014b).

A review of literature by SAMHSA (2009c) concluded that same-sex group treatment is more effective than mix-gendered. In a prospective longitudinal study, women-only groups utilized more treatment services and had better drug treatment and legal outcomes than a comparison group of women in mixed-gender groups (Niv & Hser, 2007). Other studies have found positive effects on retention (Zilberman, Tavares, Andrade, & el-Guebaly, 2003) and program completion (Grella & Joshi, 1999). In addition, a study of residential treatment found that programs designed specially to meet the needs of pregnant women and those with young children were cost-effective compared to general residential programs, despite being more expensive (French, McCollister, Cacciola, Durell, & Stephens, 2002).

Qualitative studies have assessed the reasons for better outcomes in a women-only environment. Overall, they point to the increased freedom among women to discuss difficult, gender-related topics such as intimate partner violence and other relationship issues that may be driving substance use (Grosenick & Hatmaker, 2000; Nelson-Zlupko, Dore, Kauffman, & Kaltenbach, 1996; Ravndal & Vaglum, 1994). Others have found that women-only groups provide positive role modeling and create an emotionally safe environment not found in mixed-gender groups. (Bloom & Covington, 1998; Nelson-Zlupko, Kauffman, & Dore, 1995). No studies were found that focused on the effectiveness of men-only substance treatment programs

compared to mix-gendered treatment, although mixed-gender treatment has traditionally been designed around male use patterns and needs, perhaps reducing the need for men-only treatment.

Age Differences in Substance Use and Effectiveness of Age-Based Treatment

According to a recent study by SAMHSA (2014b), alcohol and marijuana remain by far the most commonly used substances among adolescents, in line with the broader population. However, use of alcohol and marijuana, as well as harder drugs such as cocaine and heroin, fell from 2002 to 2013. Use of prescription painkillers remained steady throughout that period, but has also fallen in more recently years. While the rate of illicit drug use has been falling among adolescents in recent years, it has been increasing among Americans age 50 and older (SAMHSA, 2011). Increased non-medical use of prescription drugs has been a major contributor to increases in overall substance use prevalence, as well as increased use of marijuana.

In its report on adolescent drug use, NIDA recommends that treatment be “tailored to meet the unique needs of the adolescent,” stating that treatment should consider the patient’s level of psychological development, relationships with family and peers, gender, educational achievement, and community and cultural factors (NIDA, 2014). Similarly, SAMHSA recommends that the “treatment process...address the nuances of each adolescent’s experience, including cognitive, emotional, physical, social, and moral development” (SAMHSA, 1999). A meta analysis of 45 studies of adolescent substance use treatment found that some treatment is more effective than no treatment, and that peer group therapy and family therapy resulted in the greatest reductions in substance use post-treatment (Tanner-Smith, Wilson, and Lipsey, 2013). Another review of studies found peer support to be a key predictor of successful treatment (Williams & Chang, 2000). An economic evaluation (French et al., 2007) of family-based, individual, and group cognitive behavioral approaches for adolescents found significant differences in treatment costs and outcomes. Family therapy resulted in significantly better

outcomes, while group and individual showed positive but smaller outcomes. Given it was least expensive, group treatment was most cost-effective overall.

Among older adults, substance use is often tied to depression and poor mental health related to financial strain and social isolation (Shaw, Agahi, & Krause, 2011; Simoni-Wastila & Yang, 2006). SAMHSA recommends that age-specific treatment for older adults should be sensitive to these economic and social triggers of substance use (SAMHSA, 1998). While there are few studies of specialized services for seniors, there is evidence that it improves compliance and treatment outcomes (Kashner, Quinn, Thomas, & Mullen, 1992; Kofoed, Tolson, Atkinson, Toth, & Turner, 1987).

Organizational and Policy Predictors of Service Delivery

While these specialized services may be more effective, little research has been conducted to identify the factors that are associated with provision of these services. A limited number of studies have assessed predictors of the provision of a range of services within substance use treatment centers, although no studies were found that specifically considered gender- and age-specific services. The majority of these studies have assessed organizational factors within facilities, including profit-status, acceptance of specific types of health insurance, accreditation, and religious affiliation. Additionally, a small number of studies have considered how state policy factors, such as Medicaid coverage and funding for substance use treatment, may be associated with substance use service provision.

The profit-status of substance use treatment facilities is associated with the quantity and types of services provided. Public and non-profit facilities provide more primary care and mental health services (Friedmann, Alexander, & D'Aunno, 1999), medical care and case management services, (Montoya, 2006) and access to newly released pharmacotherapies (Knudsen, et al., 2011) than private centers. They are also more likely to offer wraparound services such as

transportation, employment assistance, childcare, social activities, and health education (Montoya, 2006; Ducharme, Mello, Roman, Knudsen, & Johnson, 2007). Patients in public and non-profit centers have longer individual sessions than those in for-profit centers (Wheeler, Fadel, & D'Aunno, 1992). Public centers provide more individual therapy as a percent of total services provided than non-profit and for-profit centers (Wheeler, Fadel, & D'Aunno, 1992). Finally, public centers are more likely to provide culturally competent services for racial and ethnic minorities (Howard, 2003a; Howard, 2003b).

For-profit centers are more likely than public and non-profit centers to offer “treatment on demand,” defined as being treated within 48 hours of initiation (Friedmann, Lemon, Stein, & D'Aunno, 2003). They also provide longer group sessions than public and non-profit centers (Wheeler, et al., 1992). However, they are more likely to turn patients away (Montoya, 2006; Friedmann, Lemon, Stein, & D'Aunno, 2003) and less likely to provide ancillary support services such as testing for HIV and other STDs, HIV education, counseling, and support, and special assistance to victims of domestic violence (Olmstead & Sindelar, 2004).

Insurance acceptance by facilities is also associated with service provision. Managed care has been found to reduce the use of inpatient substance use care (Steenrod, Brisson, McCarty, & Hodgkin, 2001) and to reduce costs in both the public (McCarty & Dilonardo, 2003) and private providers (Sturm, 2000). At the same time, having a higher percentage of patients with managed care is associated with turning more patients away (Friedmann, Lemon, Stein, & D'Aunno, 2003), offering fewer health education and preventive services, and providing less medical testing for HIV and other STDs (Wells, Lemak, & D'Aunno 2006; Olmstead, White, & Sindelar, 2004). Higher percentages of revenue coming from private insurance – either managed care or traditional fee-for-service – and self-paying clients is associated with decreased odds of offering transportation and housing assistance (Chuang, Wells, & Alexander, 2011).

Acceptance of Medicaid has been shown to have significant effects on services provided at substance use treatment facilities. In all facilities – regardless of being private, non-profit, or government-run – Medicaid acceptance is associated with increased odds of offering discharge planning and social service linkages (McBride, Chriqui, Terry-McElrath, & Malatu, 2012). In for-profit and non-profit facilities, acceptance of Medicaid patients is also associated with increased odds of provision of child care services and transportation assistance, as well as increased odds of offering housing assistance in for-profit facilities and case management services at non-profit facilities (McBride, Chriqui, Terry-McElrath, & Malatu, 2012).

There is some evidence that religiously affiliated treatment programs offer different types of services and treatment orientations than traditional programs. One study found that religiously affiliated programs are more likely to have a 12-step orientation in goals and activities, while non-religious programs were more likely to provide cognitive behavioral therapy as part of treatment (McIlwraith, Kinner, & Najman, 2011). A separate study that religiously affiliated programs were more likely to be targeted at men, although the study only considered treatment centers that offered residential services. The study also found that staff in religious-affiliated programs were more focused on “structure and discipline” than readiness to enter the workforce (Neff, et al., 2006).

Finally, various organizations have accreditation programs that require facilities to meet a given set of standards regarding their service provision. Joint Commission accreditation is associated with increased provision of mental health services (Friedmann, et al., 1999), as well as physical examinations and routine medical care (Durkin, 2002) compared to non-Joint Commission-accredited substance use treatment facilities.

Looking at policy factors, the review of literature found no studies assessing the relationship between state and federal health policies and provision of specialized substance use

treatment services for specific patient populations. However, there is limited evidence suggesting that changes in Medicaid policy and public spending on substance use treatment result in changes in provision of other treatment services. When the state of Oregon removed Medicaid coverage of outpatient substance use treatment, a significant number of non-profit treatment centers were forced to close. The study also found that opiate-addicted patients were significantly less likely to receive treatment after the change in coverage (Deck, Wiitala, & Laws 2006). On the other hand, certain Medicaid policy decisions have resulted in increased access to evidence-based care. Facilities in states with a Medicaid behavioral health carve-out are more likely to provide intensive outpatient services (Chuang, Wells, & Alexander, 2011), which entail longer sessions and include relapse prevention education, skill development, group sessions, and medication management (SAMHSA, 2006). In addition, Medicaid policies encouraging use of generic drugs on preferred drug lists and formularies is associated with increased odds of pharmacotherapy treatment adoption in treatment centers (Heinrich & Hill, 2008). Finally, the same study found increases state-level spending to be associated with provision of pharmacotherapy, with an additional \$1,000 in per-capita state-level expenditures associated with about 100 percent increased odds of provision of naltrexone in treatment centers.

METHODS

Primary data source

The primary data source for this study was the 2009 National Survey of Substance Use Treatment Services (NSSATS), an annual census of substance use treatment facilities in the United States that is planned and directed by the Center for Behavioral Health Statistics at SAMSHA and fielded by Mathematica Policy Research. The NSSATS includes information on facility characteristics, patient population, and services offered. The survey includes all known U.S. substance use treatment facilities, excluding all prisons and jails, most solo practices, facilities offering only driving while intoxicated (DWI) services, and halfway houses.

In the 2009 survey, a total of 17,226 facilities were part of the survey. Of these facilities, 2,013 (11.7%) were either closed or determined to no longer offer substance use treatment services and were deemed ineligible for the survey. Among the 15,213 facilities that were eligible, 13,513 (88.8%) were included in the final survey. Among those not included, 1,004 did not respond for the survey (6.6% of those eligible). Others were not included due to being grouped with other partner facilities.

For this analysis, the following types of facilities were removed from the analytic dataset due to major differences in their focus, funding, and operation: Facilities that primarily focus on mental health services, facilities offering hospital inpatient services, facilities not offering outpatient services, facilities offering services only for driving under the influence (DUI) offenders, and facilities for which clients were counted by partner or parent facilities. 672 facilities had missing observations for the included variables. No pattern was seen in the missing observations, so these facilities were removed from the dataset. The final analytic dataset contained 8,207 facilities.

Dependent variables

The dependent variables are binary measures for provision of services based on age and gender as measured by NSSATS. These include provision of any gender-based service and any age-based service, as well as separate measures for provision of specialized services for adult women, adult men, adolescents, and seniors. The NSSATS questionnaire distinguishes between simply serving members of these populations versus providing services specially designed to address the particular needs of the populations. Additional binary dependent variables were created to allow for comparisons of factors across genders and age groups. Among the subset of facilities offering only one gender-based service (n= 1,343), a variable was created to compare provision of specialized services for women only versus services for men only. Similarly, among

the subset of facilities offering only one age-based service (n=2,839), a variable was created to compare provision of services for adolescents only versus for seniors only.

Independent variables

Independent variables are included at three levels—facility, county, and state—based on previous studies suggesting correlations of these factors with service provision in substance use treatment. At the facility-level, binary variables were included for acceptance of Medicare, Medicaid, and private insurance, for-profit status, Joint Commission accreditation, provision of any mental health services, location in a rural area (any area outside a Census-defined Metropolitan Statistical Area) and religious affiliation. A categorical variable with five quintiles for total program admissions was also included to control for organization size and resources. All organizational measures were derived from NSSATS.

In addition, several variables were included at the county- and state-levels. At the county-level, covariates for percent living in poverty and percent Caucasian were derived from 2010 U.S. Census data. At the state-level, a binary variable was included for Medicaid coverage of outpatient substance use treatment, which was taken from a federal survey of states by the (HHS, 2012c). In addition, a categorical variable was included for per-beneficiary Medicaid spending on substance use treatment. Spending data were projections released by HHS in 2010 based on previous years' expenditures (HHS, 2012c). 2010 Medicaid enrollment data from the Kaiser Family Foundation were used to create the per-capita spending rate.

Data analysis

Three-level logistic regression models were used to estimate odds of provision of any gender-based services or age-based services and the odds of provision of specialized services for adult women, adult men, adolescents, and seniors across all 8,207 facilities. Additional three-level logistic regression models were estimated on subsets of the data to compare differences

across genders and age groups. These additional models estimated the odds of provision of specialized services for adult women only compared to provision of services for adult men only among facilities offering one gender based service and odds of provision of services for adolescents only compared to services for seniors only among those offering one age-based service. For continuous variables, outliers were held to three standard deviations above or below the mean. More parsimonious models, including one- and two-level models excluding county- and state-level factors, were also estimated. Model fit was assessed using Akaike's Information Criteria (AIC) and Bayesian Information Criteria (BIC), which allowed for the comparisons across both nested and non-nested models. See Appendix D for comparison of AIC and BIC values and regression results for select alternative models.

RESULTS

Descriptive statistics

Table 3-1 presents descriptive statistics for all study variables. Approximately 37 percent of facilities offer any gender-based specialized treatment, while slightly more – about 38 percent – offer any age-based specialized treatment. Roughly a third of all facilities offer specialized services for adult women, while approximately one-fourth offer specialized services for adult men. About 35 percent offer specialized services for adolescents and just six percent offer them for seniors. Approximately 35 percent of facilities are for-profit. Private insurance is accepted by 64 percent of facilities, while 56 percent accept Medicaid and 31 percent accept Medicare. Approximately one-fourth of all facilities are located in rural areas. About 16 percent are accredited by the Joint Commission and about four percent have a religious affiliation.

The average percent of residents in the surrounding county that are white is 78 percent, while the mean poverty rate is approximately 15 percent. About 94 percent of facilities are located in states that provide Medicaid coverage for outpatient substance use treatment. The

mean state-level Medicaid spending per beneficiary on substance use treatment was \$65.31 per year across all facilities, with a range of \$6.09 to \$239.05.

Regression results

Table 3-2 presents results for the analyses of gender-based services. Provision of mental health services (OR=0.86), for-profit status (OR=0.71), and Joint Commission accreditation (0.67), and rural location (OR=0.83) were all negatively associated with provision of any gender-based services. On the other hand, facilities accepting Medicaid (OR=1.25), those with religious affiliation (OR=1.35), and those with higher client counts (OR=1.29) were significantly more likely to offer any gender-based services. All these variables were highly significant with p-values smaller than 0.01. At the state-level, higher levels of per beneficiary Medicaid spending were positively associated with providing any gender-based services (OR=1.10).

For-profit facilities were marginally less likely to provide services for adult men than non-profit and public units (OR=0.90). Private insurance acceptance (OR = 1.20) and religious affiliation (OR = 1.60) were both positively associated with provision of men's services, while Joint Commission accreditation was negatively associated (OR = 0.72). At the county-level, increasing portions of the population being Caucasian (OR = 0.91) and higher rates of poverty (OR=0.86) were negatively associated with provision of men's services. In addition, at the state-level, Medicaid spending per beneficiary on substance use treatment was significantly associated with provision of specialized men's services (OR = 1.14).

For adult women, facilities also providing mental health services were 12 percent less likely to provide gender-based services (OR = 0.88). As for adult men, for-profit status (OR = 0.74) and Joint Commission accreditation (OR = 0.70) were negatively associated with services for women. Facilities accepting Medicaid were about one-third more likely to provide specialized treatment services for women (OR = 1.34), while facilities located in rural areas were

15 percent less likely (OR=0.85). Increased Medicaid spending on substance use treatment was marginally significantly associated with provision of specialized services for women (OR=1.08).

Comparing facilities that offer only women's services versus those that offer only men's services, religiously affiliated facilities were approximately twice as likely to provide services for men than for women (OR=0.53), while those accepting Medicaid were 2.5 times more likely to offer services for women than for men (OR=2.51). For-profit facilities were about 25 percent more likely to offer services for men than for women, although this result was of marginal statistical significance. Facilities with larger client counts were significantly more likely to offer women's services (OR=1.22) than men's services, while higher per beneficiary state Medicaid spending on substance use treatment was significantly associated with provision of men's services compared provision of women's services (OR=0.86).

Regression results for age-based services are presented in Table 3-3. Provision of mental health services (OR=1.52), Medicaid acceptance (OR=1.48), private insurance acceptance (OR=1.42), rural location (OR=1.37), and higher client counts (OR=1.13) were all significantly positively associated with providing any age-based services. Facilities accepting Medicare (OR=0.85), for-profit facilities (OR=0.73), and those with Joint Commission accreditation (OR=0.67) were less likely to provide age-based services. Every 10 percent increase in poverty in the surrounding county was associated with an 18 percent decrease in the odds of providing age-based services (OR=0.82), while state Medicaid coverage of outpatient substance use treatment was marginally associated with a 43 percent increase in odds (OR=1.43).

All facility-level variables except religious affiliation were highly significantly associated with delivery of specialized services for adolescents. As with services for men and women, for-profit status (OR = 0.72) and Joint Commission accreditation (OR = 0.65) were negatively associated with provision of adolescent services. Facilities also providing mental health services

were more than 50 percent more likely to offer services for this population (OR = 1.53) and those accepting Medicaid were 65 percent more likely to provide them (OR = 1.65). Private insurance acceptance (OR = 1.44) and rural location (OR=1.45) were also positively associated with provision of services for adolescents. At the county-level, higher rates of poverty were negatively associated with provision of these services (OR=0.80). At the state-level, Medicaid coverage of outpatient substance use treatment was marginally associated with about a 50 percent increase in odds that a facility would offer adolescent services (OR=1.49).

For seniors, profit status was highly significant, with for-profit facilities being about 30 percent more likely to provide services (OR=1.27). Facilities providing mental health services were 25 percent more likely to offer services for seniors (OR = 1.25). Medicare acceptance was positively associated with service provision (OR=1.65), while Medicaid acceptance was negatively associated (OR = 0.69). At the county-level, Caucasian race was marginally negatively associated with provision of services for seniors. At the state-level, increased Medicaid spending on substance use treatment per beneficiary was highly positively associated with service provision (OR = 1.16).

Comparing facilities offering services for only one age group, those accepting Medicaid (OR=2.33) and those located in rural areas (OR=2.62) were more than twice as likely to offer services for adolescents as seniors. Private insurance acceptance (OR=1.42) and higher client counts (OR=1.41) were also significantly more likely to provide services for adolescents than for seniors. On the other hand, for-profit facilities (OR=0.71) and those accepting Medicare (OR=0.67) were more likely to provide services for the seniors than adolescents. Facilities in counties with higher rates of poverty (OR=0.65) and in states with higher levels of Medicaid spending (OR=0.82) were also more likely to offer services for seniors than for adolescents.

DISCUSSION

Summary and implications

This analysis identifies several key factors related to provision of age- and gender-based treatment. The inconsistent direction of these relationships for different groups and the results of the direct comparisons of genders and age groups suggest the potential for access issues for some individuals seeking age- and gender-based treatment. These results have important policy considerations, especially in light of the recent implementation of the ACA.

There were significant differences in types of insurance accepted. Type of insurance accepted largely matched the age and gender groups most likely to be covered by certain payers. Medicare acceptance was highly associated with services for seniors, while Medicaid acceptance was highly associated with services for adolescents and adult women, who accounted for about 68 percent of adult Medicaid enrollees in 2009 (Kaiser Family Foundation, 2012). Facilities accepting private insurance were more likely to offer services for men. While perhaps not surprising, these results indicate that changes in coverage source due to “churning,” job changes, and simply reaching certain age thresholds can alter treatment choices even when they do not result in coverage gaps. In states that have recently expanded Medicaid under the ACA, newly covered populations, such as adult men, may not have as many opportunities for specialized treatment as other populations. Studies of service provision post-implementation of the ACA will be necessary to understand the extent to which treatment centers respond to the changing demographics in Medicaid and other insurers.

The association of age- and gender-based services with mental health service provision also has implications for service accessibility. Substance use is often comorbid with depression and other mental health conditions, and integrated substance use and mental health services have been shown to be more effective than separate services (Drake, Mercer-McFadden, Mueser, McHugo, & Bond, 1998). This is especially the case for adult women, who often enter treatment with mental health needs related to family problems, intimate partner violence, and other social

issues (Greenfield, Back, Lawson, & Brady, 2010; Grella & Joshi, 1999). Adult men and women with co-morbid conditions may not have adequate opportunities to receive mental health integrated with their group-focused substance use treatment.

Adult men were the only group for which facility religious affiliation was associated with group-focused services. There has long been a relationship between substance use treatment and religion. The 12-step orientation, which has religious underpinnings, has demonstrated effectiveness and is the predominant approach in substance use treatment in the U.S. Its widespread use is evidence of the preference of many treatment seekers for religious-based treatment. The analysis of facilities providing services for only one gender indicates that women have significantly fewer opportunities for gender-based, religiously oriented treatment than men, which could include 12-step programs. The reasons for this are unclear, although it is likely related to gender dynamics and roles in certain religions and particular Christian denominations. In addition, the results also suggest that women residing in rural areas may not have adequate access to gender-specific treatment.

Profit-status was highly significant for each group, although the direction of the relationship was inconsistent. Non-profit and public facilities were more likely to offer services for adult men, adult women, and adolescents, while for-profit facilities were more likely to offer services for seniors, even after controlling for Medicare acceptance. Since literature shows that non-profit and public treatment centers are more likely to offer ancillary and other wrap-around services, seniors seeking specialized services may not have adequate access to a full range of supplementary services.

State-level Medicaid policy was also associated with service provision for these groups. Coverage of outpatient substance use treatment was positively associated with services for all groups, although this association was only significant for adolescents. Since adolescents are

more likely to be covered by Medicaid, this is a logical result. At the same-time, per-beneficiary Medicaid spending on substance use was associated with provision of services for adult men and seniors, populations not as likely to be covered by Medicaid. This may reflect relatively consistent coverage and spending for adult women and adolescents across states. States spending more on substance use treatment are probably more likely to have expanded coverage that includes additional populations, such as adult men. This result suggests that additional state Medicaid spending on substance use treatment translates into increased provision of services for populations not traditionally covered by Medicaid. Policymakers should consider increasing reimbursements and/or coverage for substance use treatment to expand the provision of specialized treatment services.

Limitations

This study has several limitations. First, the use of cross-sectional data limits the inferences that can be made from the results to associations; no conclusions can be made regarding causality of the relationships between the study variables. Longitudinal studies are needed to establish the causal effects of these factors in order to confidently make evidence-based policy decisions.

Second, there are limitations related to the independent variables. While the included set of independent variables was identified by a literature review, they are not the only explanatory organizational and policy factors in determining substance use service delivery. Data availability limited the ability to include other potential explanatory factors. In addition, the variable for Medicaid coverage of outpatient substance use treatment does not capture the complexity of Medicaid coverage. Most states have Medicaid managed care organizations (MCOs), which may or may not match that state's fee-for service Medicaid's coverage policies. Other states may also provide this coverage for certain beneficiaries under limited waiver programs, which are not captured in this variable.

Finally, previous studies have questioned the validity of NSSATS questions on provision of services for specific groups, suggesting that question wording was leading to over-reporting of provision of these services (Cochran, Peavy, & Robohm, 2007). In response to these concerns, SAMHSA made adjustments to the questions by more clearly making a distinction between simply providing services to members of the particular demographic group versus offering specialized services designed to specifically meet the needs of that group. After this change, the portion of facilities reporting provision of these services decreased, suggesting increased validity. However, there is still the potential for incorrect responses to these questions in NSSATS.

Conclusion

Gender- and age-based substance use treatment has been shown in previous studies to be effective at treating substance use disorders. Existing studies have identified a range of organizational and policy factors that are associated with provision of ancillary services in substance use treatment, although none assessed the relationship to gender- and age-based services. Multilevel analyses identified significant associations between insurance acceptance, provision of mental health services, profit-status, religious affiliation, and other facility-level factors. Medicaid coverage and spending at the state-level also has associations with provision of gender-and age-based services. These associations have implications for access to care for individuals seeking age- and gender-based treatment.

Table 3-1. Descriptive Statistics		
	Frequency or mean (SD)	Percentage or range
<i>Facility-Level Variables</i>		
<i>Gender-Based Treatment Services</i>		
Provides any gender-based specialized treatment services	3,047	37.13%
Provides specialized treatment services for adult women	2,766	33.70%
Provides specialized treatment services for adult men	1,985	24.19%
Provides specialized treatment services for adult women among facilities offering only one gender-based service (n=1,343)	1,062	79.08%
<i>Age-Based Treatment Services</i>		
Provides any age-based specialized treatment services	3,093	37.69%
Provides specialized treatment services for adolescents	2,851	34.74%
Provides specialized treatment services for seniors	496	6.04%
Provides specialized treatment services for adolescents among facilities offering only one age-based service (n=2,839)	2,549	91.48%
Also provides mental health services	2,816	34.31%
For-profit	2,845	34.67%
Accepts Medicare	2,559	31.18%
Accepts Medicaid	4,611	56.18%
Accepts private insurance	5,291	64.47%
Religiously affiliated	358	4.36%
Rural location	2,005	24.43%
Joint Commission accredited	1,352	16.47%
Patient admissions	253.37 (288.65)	1 – 1442.894
<i>County-Level Variables</i>		
Percent Caucasian race	78.29 (15.64)	30.19 – 99.00
Percent living in poverty	14.62 (5.18)	3.4 – 30.55
<i>State-Level Variables</i>		
Medicaid coverage of outpatient substance use treatment	7,716	94.02%
Medicaid spending on substance use treatment per beneficiary	65.361 (58.28)	6.09 – 239.05

Table 3-2. Regression Results for Gender-Based Services				
	Any Gender-Based Service Odds Ratio (95% CI)	Specialized Treatment for Adult Women Odds Ratios (95% CI)	Specialized Treatment for Adult Men Odds Ratio (95% CI)	Only Women's Services (=1) vs. Only Men's Services (=0) Odds Ratio (95% CI)
<i>Facility-Level Variables</i>				
Provides mental health services	0.86** (0.77-0.96)	0.88* (0.78-0.98)	0.93 (0.82-1.06)	0.95 (0.68-1.32)
For-profit status	0.71** (0.64-0.80)	0.73** (0.65-0.82)	0.90 (0.79-1.02)	0.75 (0.54-1.05)
Accepts Medicare	0.97 (0.85-1.09)	1.01 (0.89-1.15)	0.97 (0.85-1.12)	1.37 (0.93-2.00)
Accepts Medicaid	1.25** (1.11-1.41)	1.34** (1.19-1.52)	0.92 (0.81-1.06)	2.51** (1.77-3.55)
Accepts private insurance	1.08 (0.97-1.22)	1.08 (0.96-1.22)	1.20** (1.05-1.36)	0.83 (0.60-1.15)
Religiously affiliated	1.35** (1.07-1.70)	1.19 (0.95-1.51)	1.60** (1.25-2.04)	0.53* (0.30-0.94)
Rural location	0.83** (0.72-0.95)	0.85* (0.74-0.98)	0.95 (0.81-1.11)	1.09 (0.72-1.66)
Joint Commission accredited	0.67** (0.59-0.77)	0.70** (0.61-0.80)	0.72** (0.62-0.85)	1.13 (0.73-1.74)
Patient admissions (quintiles)	1.29** (1.25-1.34)	1.31** (1.27-1.36)	1.23* (1.18-1.28)	1.22** (1.10-1.36)
<i>County-Level Variables</i>				
Percent Caucasian race (in 10s)	0.95* (0.91-0.99)	0.95 (0.91-1.00)	0.91** (0.86-0.96)	1.04 (0.92-1.17)
Percent living in poverty (in 10s)	0.95 (0.84-1.08)	0.95 (0.84-1.08)	0.86* (0.74-0.99)	1.07 (0.75-1.52)
<i>State-Level Variables</i>				
Medicaid coverage of outpatient substance use treatment	1.16 (0.80-1.67)	1.25 (0.85-1.84)	1.07 (0.70-1.63)	1.50 (0.82-2.73)
Medicaid spending on substance use treatment per beneficiary (quintiles)	1.10* (1.01-1.19)	1.08 (0.99-1.18)	1.14** (1.04-1.25)	0.86* (0.77-0.97)
=p < 0.05; *=P <0.01				

Table 3-3. Regression Results for Age-Based Services				
	Any Age- Based Service Odds Ratio (95% CI)	Specialized Treatment for Adolescents Odds Ratio (95% CI)	Specialized Treatment for Seniors Odds Ratio (95% CI)	Only Adolescent Services (=1) vs. Only Senior Services (=0) Odds Ratio (95% CI)
<i>Facility-Level Variables</i>				
Provides mental health services	1.52** (1.36-1.69)	1.53** (1.37-1.72)	1.25* (1.02-1.54)	1.24 (0.91-1.70)
For-profit status	0.73** (0.65-0.82)	0.72** (0.64-0.81)	1.27* (1.02-1.57)	0.71* (0.51-0.99)
Accepts Medicare	0.85* (0.75-0.96)	0.82** (0.73-0.93)	1.65* (1.31-2.08)	0.67* (0.47-0.96)
Accepts Medicaid	1.48** (1.31-1.67)	1.65** (1.45-1.87)	0.69** (0.54-0.87)	2.33** (1.62-3.34)
Accepts private insurance	1.42** (1.26-1.59)	1.44** (1.27-1.62)	1.14 (0.91-1.43)	1.42* (1.01-2.00)
Religiously affiliated	0.95 (0.75-1.20)	0.91 (0.71-1.16)	1.32 (0.86-2.02)	0.72 (0.38-1.35)
Rural location	1.37** (1.19-1.57)	1.45** (1.25-1.67)	0.80 (0.60-1.06)	2.62** (1.65-4.15)
Joint Commission accredited	0.67** (0.58-0.77)	0.65** (0.56-0.75)	0.88 (0.67-1.14)	0.74 (0.50-1.10)
Patient admissions (quintiles)	1.13** (1.09-1.17)	1.15** (1.11-1.19)	0.97 (0.91-1.04)	1.15* (1.03-1.27)
<i>County-Level Variables</i>				
Percent Caucasian race (in 10s)	0.99 (0.95-1.04)	1.01 (0.96-1.07)	0.91* (0.84-0.98)	1.12 (0.99-1.27)
Percent living in poverty (in 10s)	0.82** (0.72-0.93)	0.80** (0.70-0.92)	1.12 (0.89-1.40)	0.64* (0.45-0.90)
<i>State-Level Variables</i>				
Medicaid coverage of outpatient substance use treatment	1.43 (0.95-2.16)	1.49 (0.95-2.33)	1.25 (0.72-2.16)	1.14 (0.46-2.82)
Medicaid spending on substance use treatment per beneficiary (in 10s)	0.96 (0.87-1.05)	0.94 (0.85-1.04)	1.16** (1.04-1.28)	0.83* (0.69-0.99)
=p < 0.05; *=P <0.01				

CHAPTER 4: IS SOCIAL CLIMATE ASSOCIATED WITH REDUCED ACCESS TO HEALTH SERVICES FOR PERSONS WITH HIV? AN ANALYSIS OF SUBSTANCE USE TREATMENT

INTRODUCTION

Among persons living with HIV/AIDS, there is great need for access to evidence-based substance use treatment. Rates of substance use are higher among persons with HIV than the general population, with about one in four persons living with the virus having engaging in binge drinking and one third using illicit drugs in a given month (SAMHSA, 2013; RAND Corporation, 2007). These high rates of substance use result in part from coping with the stress, anxiety, and physical pain that results from HIV infection and living with AIDS (Pence, Thielman, Whetten, Ostermann, Kumar, & Mugavero, 2008). Substance use is also a significant risk factor for new infections. The CDC (2011) estimates that injection drug use accounts for 12 percent of new HIV infections and 17 percent for those currently living with HIV. Use of drugs and alcohol also leads to risky sexual behaviors that increase the likelihood of infection (NIDA, 2012).

Integrated treatment for substance use and HIV has been identified as a best practice. A SAMHSA Treatment Improvement Protocol (TIP) states that “treatment for substance use and HIV/AIDS should reflect the interconnected relationship they share and be coordinated as much as possible to maximize care” (SAMHSA, 2000). The TIP states that HIV prevention services are essential for all substance use treatment settings (SAMHSA, 2000), while integrated early intervention services, such as post-test counseling and ongoing follow-up for those diagnosed with HIV, are effective in increasing adherence, improving health over the long-term, and reducing rates of transmission (Hodgson, 1999; Gibson, McCusker, & Chesney, 1998). SAMHSA also recommends peer-based treatment support groups and group treatment services as

effective treatment options for persons with HIV for their similar positive impact on health status over the long-term (SAMHSA, 2000).

While these services have shown effectiveness, they may not be accessible to all persons with HIV and substance use disorders. Stigma and discrimination remain common experiences for persons living with HIV, and there is strong evidence that these perceptions negatively impact the accessibility and quality of the health care they receive (Kaiser Family Foundation, 2011). Multiple studies have determined that negative views of persons with HIV are highly attributable to negative perceptions of sexual minorities and specifically MSM, (Herek & Capitanio, 1999; Herek, 2002; Tomaszewski, 2012) who account for about two-thirds of new HIV infections (CDC, 2011). While there is evidence that overt discrimination is experienced in health care settings, no studies have considered how negative perceptions may impact decisions to provide services for populations with or at-risk of HIV infection. This study evaluates the relationship between provision of HIV-related services in a national survey of substance use treatment providers with estimates of social climate towards sexual minorities, which is assessed through a proxy measure of state-level support for gay rights. Social climate is considered alongside policy factors and organizational factors identified by the literature.

HIV Stigma and Discrimination in Health Care Settings

While negative perceptions have been slowly decreasing, substantial portions of Americans report discomfort with people with HIV. A 2011 survey found that less than half of Americans would be very comfortable working with someone with HIV or AIDS, while only about one third of parents would be very comfortable with their child having a teacher that is HIV positive (Kaiser Family Foundation, 2011). The same survey found that approximately 77 percent of Americans think that persons living HIV and AIDS in the United States face “a lot of” or “some” prejudice and discrimination.

There is evidence that stigma and negative perceptions of persons living with HIV manifests into discrimination against people with HIV within health care delivery settings. A recent survey (Lambda Legal, 2010) asked individuals with HIV/AIDS about their health care experiences, nearly two-thirds reported experiencing discrimination in health care settings. More than 35 percent reported health care professionals refusing to touch them or using excessive precaution. One in four reported health care professionals blaming them for their health status. About 12 percent reported providers using harsh or abusive language, while about four percent reported providers being physically rough or abusive. An older study found that 26 percent of 2,466 adults with HIV surveyed found had experienced discrimination in health care settings, with 8 percent being refused service (Schuster, Collins, Cunningham, Morton, Zierler, Wong, & Kanouse, 2005).

Providers themselves have reported witnessing HIV-related stigma amongst colleagues. A qualitative study of 39 rural HIV service providers identified stigma against persons dually diagnosed with HIV and substance use (Yannessa, Reece, & Basta, 2008). Primary care providers noted that HIV-positive persons seeking substance use treatment services were turned away from some facilities or felt unwelcome and unable to speak freely about their conditions. Similar results were seen in a random survey of primary care physicians. Providers scoring low on an attitudinal scale measuring comfort levels seeing HIV-positive patients were significantly less likely to accept these patients. Those reporting feeling being uncomfortable with gay patients were significantly less likely to have treated someone with HIV/AIDS (Shi et al., 1997).

Organizational and Policy Predictors of Service Delivery

In assessing the relationship of social climate with delivery of HIV-related services, it is essential to control for organizational factors that predict service delivery more broadly. A review of literature found several studies that assessed organizational predictors of the provision of ancillary, wraparound, and other services within substance use treatment centers, including a few

that consider HIV-related services. In addition, a review of sources of substance use funding identified policy factors that may impact delivery of HIV-related services in treatment centers.

The profit-status of substance use treatment facilities is associated with the quantity and types of services provided. Public and non-profit facilities provide more primary care and mental health services (Friedmann, Alexander, & D'Aunno, 1999), medical care and case management services, (Montoya, 2006) and access to newly released pharmacotherapies (Knudsen, et al., 2011) than private centers. They are also more likely to offer wraparound services such as transportation, employment assistance, childcare, social activities, and health education (Montoya, 2006; Ducharme, Mello, Roman, Knudsen, & Johnson, 2007). Patients in public and non-profit centers have longer individual sessions than those in for-profit centers (Wheeler, Fadel, & D'Aunno, 1992). Public centers provide more individual therapy as a percent of total services provided than non-profit and for-profit centers (Wheeler, Fadel, & D'Aunno, 1992). Finally, public centers are more likely to provide culturally competent services for racial and ethnic minorities (Howard, 2003a; Howard, 2003b).

For-profit centers are more likely than public and non-profit centers to offer “treatment on demand,” defined as being treated within 48 hours of initiation (Friedmann, Lemon, Stein, & D'Aunno, 2003). They also provide longer group sessions than public and non-profit centers (Wheeler, et al., 1992). However, they are more likely to turn patients away (Montoya, 2006; Friedmann, Lemon, Stein, & D'Aunno, 2003) and less likely to provide ancillary support services such as testing for HIV and other STIs, HIV education, counseling, and support, and special assistance to victims of domestic violence (Olmstead & Sindelar, 2004).

Insurance acceptance by facilities is also associated with service provision. Managed care been found to reduce the use of inpatient substance use care (Steenrod, Brisson, McCarty, & Hodgkin, 2001) and to reduce costs in both the public (McCarty & Dilonardo, 2003) and private

providers (Sturm, 2000). At the same time, having a higher percentage of patients with managed care is associated with turning more patients away (Friedmann, Lemon, Stein, & D'Aunno, 2003), offering fewer health education and preventive services, and providing less medical testing for HIV and other STIs (Wells, Lemak, & D'Aunno 2006; Olmstead, White, & Sindelar, 2004). Higher percentages of revenue coming from private insurance – either managed care or traditional fee-for-service – and self-paying clients is associated with decreased odds of offering transportation and housing assistance (Chuang, Wells, & Alexander, 2011).

Acceptance of Medicaid has been shown to have significant effects on services provided at substance use treatment facilities. In all facilities – regardless of being private, non-profit, or government-run – Medicaid acceptance is associated with increased odds of offering discharge planning and social service linkages (McBride, Chriqui, Terry-McElrath, & Malatu, 2012). In for-profit and non-profit facilities, acceptance of Medicaid patients is also associated with increased odds of provision of child care services and transportation assistance, as well as increased odds of offering housing assistance in for-profit facilities and case management services at non-profit facilities (McBride, Chriqui, Terry-McElrath, & Malatu, 2012).

There is some evidence that religiously affiliated treatment programs offer different types of services and treatment orientations than traditional programs. One study found that religiously affiliated programs are more likely to have a 12-step orientation in goals and activities, while non-religious programs were more likely to provide cognitive behavioral therapy as part of treatment (McIlwraith, Kinner, & Najman, 2011). A separate study that religiously affiliated programs were more likely to be targeted at men, although the study only considered treatment centers that offered residential services. The study also found that staff in religious-affiliated programs were more focused on “structure and discipline” than readiness to enter the workforce (Neff, et al., 2006).

Finally, various organizations have accreditation programs that require facilities to meet a given set of standards regarding their service provision. Joint Commission accreditation is associated with increased provision of mental health services (Friedmann, et al., 1999), as well as physical examinations and routine medical care (Durkin, 2002) compared to non-Joint Commission-accredited substance use treatment facilities.

The review of literature also considered trends in the financing of substance use treatment as they relate to HIV-related services. More than half of all substance use treatment received in the U.S. is funded by public sources, including Medicaid and federal-to-state block grants from SAMHSA, and this percentage is increasing as a result of the Patient Protection and Affordable Care Act (ACA) (Buck, 2011). While the Ryan White program is a significant funder of HIV-related services more broadly, as a payer of last resort it has traditionally not been a major source of substance use treatment for persons with HIV (Health Resources and Services Administration, 2014). A review of the literature found no studies considering the association between state and federal spending policy and provision of HIV-related services in substance use treatment, although statistics on funding sources do suggest a potential policy factor for consideration.

Outside of Medicaid, federal-to-state block grants from SAMHSA and direct spending by state and local governments together account for about half of total public spending on substance use treatment (Mark, Levit, Vandivort-Warren, Coffey, & Buck, 2007). Given the allocation formulas used by SAMHSA, block grant funding is relatively evenly allocated across states based on level of patient need (SAMHSA, 2014a). However, SAMHSA has placed some requirements on how states spend block grant funding, including requiring states with high prevalence of HIV to spend at least five percent of funds on treatment services for individuals with HIV (SAMHSA, 2014c). No studies were found that directly tied SAMHSA block grant funding amounts to delivery of specific treatment services. One study was found, however, that assessed the effect of state funding levels on provision of pharmacotherapies. It found that an additional \$1,000 in per-

capita state expenditures was associated with about 100 percent increased odds of provision of naltrexone (Heinrich & Hill, 2008).

METHODS

Primary data source

The primary data source for this study was the 2009 National Survey of Substance Use Treatment Services (NSSATS), an annual census of substance use treatment facilities in the United States that is planned and directed by the Center for Behavioral Health Statistics at SAMSHA and fielded by Mathematica Policy Research. The NSSATS includes information on facility characteristics, patient population, and services offered. The survey includes all known U.S. substance use treatment facilities, excluding all prisons and jails, most solo practices, facilities offering only driving while intoxicated (DWI) services, and halfway houses.

In the 2009 survey, a total of 17,226 facilities were part of the survey. Of these facilities, 2,013 (11.7%) were either closed or determined to no longer offer substance use treatment services and were deemed ineligible for the survey. Among the 15,213 facilities that were eligible, 13,513 (88.8%) were included in the final survey. Among those not included, 1,004 did not respond for the survey (6.6% of those eligible). Others were not included due to being grouped with other partner facilities.

The following types of facilities were removed from the analysis due to significant differences in their focus, funding, and operation: Facilities that primarily focus on mental health services, facilities offering hospital inpatient services, facilities not offering outpatient services, facilities offering services only for driving under the influence (DUI) offenders, and facilities for which clients were counted by partner or parent facilities. In addition, 555 facilities had missing observations for the included variables. No pattern was seen in the missing observations, so these

facilities were removed from the dataset. The final analytic dataset contained a total of 8,324 facilities.

Dependent variables

The dependent variables are binary measures for provision of any HIV-related services, specialized substance use treatment (SSUT) for persons living with HIV, early HIV intervention services, HIV education, and HIV testing. In addition, these variables were used to a binary measure of offering only preventive services primarily intended for non-infected, at-risk populations (HIV education and/or HIV testing) versus offering treatment services for HIV-positive individuals (SSUT and/or early HIV intervention services) among those facilities offering any HIV-related services.

Independent variables

The key independent variable is a state-level estimate of social climate. There are few data sources available that estimate social climate for persons with HIV. Most surveys assessing views toward persons with HIV are national and do not have sample sizes large enough to disaggregate to smaller geographic units with precision. Some state-level surveys exist, but are not directly comparable due to differences in survey questions and sampling methodology.

State-level support for gay rights was used as a proxy measure for social climate due to the limitations mentioned above and because of the relationship between HIV-related stigma and negative views of sexual minorities (Herek & Capitanio, 1999; Herek, 2002; Tomaszewski, 2012). The estimates were derived using multilevel regression and post-stratification (MRP) of data national surveys (Lax & Phillips, 2009a). MRP compensates for small within-state samples by using demographic and geographic correlations for adjustment. All individuals in the survey, regardless of their location, yield information about demographic patterns that can be applied to all state estimates. The estimates for each demographic-geographic respondent type are then

weighted by the percentages of each type in actual state populations to estimate the percentage of respondents within each state who have a particular issue position. The investigators used this method to estimate support for eight different gay rights or policies, including housing non-discrimination, marriage, adoption, and hate crimes (Lax and Phillips, 2009a), which were averaged for an overall estimate of support for gay rights. This approach has been shown to produce better results than other methods, such as simply disaggregating national polls (Gelman & Little, 1997; & Phillips, 2009b; Park, Gelman, & Bafumi, 2006).

Additionally, a binary variable was included for SAMHSA HIV-designated states. States with an HIV/AIDS prevalence rate greater than 10 per 100,000 are deemed HIV-designated states and are required to designate at least 5 percent of the SAMHSA block grant awards on HIV intervention services. These include HIV testing, early intervention, counseling, education, referral services, risk assessments, and integrated infectious disease services.

At the facility-level, binary variables were included for acceptance of Medicare, Medicaid, and private insurance, for-profit status, Joint Commission accreditation, rural location (defined as being located outside a Metropolitan Statistical Area), provision of any mental health services, and religious affiliation. A categorical variable with five quintiles for total program admissions was also included to control for organizational size and resources. All organizational measures were derived from NSSATS.

In addition, several covariates were included at the county-level. Measures of poverty rate and race/ethnicity were derived from 2010 U.S. Census data. In addition, variables were included to adjust for the size of the LGB and HIV populations in each county. Estimates of the HIV prevalence rate are from state reports to the Centers for Disease Control and Prevention. For states not reporting prevalence data to the CDC, estimates were taken directly from state health department reports.

The U.S. Census does not ask respondents questions about their sexual orientation. However, the Census Bureau developed a procedure to estimate the number of same sex couples in each state, and researchers have used this procedure to estimate the number of same sex couples in each U.S. county (The Williams Institute, 2011). Same-sex couples are identified in households where the respondent describes his or her relationship with another adult of the same sex in the same as a “husband/wife” or “unmarried partner.” These numbers are then adjusted to account for the likelihood that a small portion of different-sex couples miscode the sex of a spouse or partner and are incorrectly counted as a same-sex couple.

Data analysis

Three-level logistic regression models were used to estimate the odds of provision of any HIV-related service, specialized substance use treatment (SSUT) services for persons with HIV/AIDS, early HIV intervention, HIV testing, and HIV education. An additional three-level logistic model was estimated on a subset of the data (facilities offering at least one HIV-related service, $n=4,992$) to estimate the odds of provision of services for HIV-positive individuals (specialized substance use treatment and early HIV intervention services) compared to only providing HIV services for at-risk populations (education and testing). For continuous variables, outliers were held to three standard deviations above or below the mean. More parsimonious models, including two-level models excluding state-level factors and three-level models excluding demographic characteristics, were also estimated. Model fit was assessed using Akaike’s Information Criteria (AIC) and Bayesian Information Criteria (BIC), which allowed for the comparisons across both nested and non-nested models. See Appendix E for comparison of AIC and BIC values and regression results for select alternative models.

RESULTS

Descriptive statistics

Descriptive statistics are presented in Table 4-1. About 60 percent of the 8,324 substance use treatment facilities in the analytic dataset offer any HIV-related service. Approximately nine percent of facilities offer SSUT for persons with HIV, while about one-quarter of facilities offer early intervention services for persons diagnosed with HIV. On the prevention side, about 55 percent offer HIV education services while one-quarter offer HIV testing. Among 4,992 facilities offering any HIV-related services, about 46 percent offer any services for HIV-positive compared to only offering preventive services for populations at-risk for infection.

Approximately 35 percent of facilities are for-profit. About one-third of facilities provide mental health services and 17 percent of facilities are accredited by the Joint Commission. Medicaid is accepted by 55 percent of facilities, while about 30 percent accept Medicare and 63 percent accept private insurance. About four percent of facilities are religiously affiliated. On average, each facility had 253 annual patient admissions.

At the county-level, on average about 78 percent of the population was Caucasian and 15 percent of individuals were living in poverty. On average, each county had 2,785 same sex couples and an HIV prevalence rate of 343 per 100,000 individuals. At the state-level, support for gay rights averaged 58 percent and about 55 percent of facilities were located in SAMHSA HIV-designated states.

Regression results

Table 4-2 presents the results of the regression analyses. Facilities offering mental health services (OR=0.63) and for-profit facilities (OR=0.61) were both about 40 percent less likely to offer any HIV-related services. Medicaid acceptance was associated with about a 64 percent increased odds of offering any HIV-related services, while religious affiliation (OR=0.59) and

rural location (OR=0.84) were associated with decreased odds. Joint Commission accreditation (OR=1.34) and increased patient admissions (OR=1.10) were both associated with increased odds of offering any HIV services. At the county-level, higher rates of poverty (OR=1.25) and percent racial/ethnic minority (OR=0.91) were associated with increased odds of offering any HIV services. At the state-level, SAMHSA HIV designation was associated with a 55 percent increase in odds of facilities offering any HIV-related services. State-level support for gay rights was not significantly associated with provision of any HIV-related services.

Medicaid acceptance was positively associated with provision of services for HIV-positive individuals, with about a 40 percent increased odds of offering both SSUT services for persons with HIV (OR=1.39) and HIV early intervention (OR=1.43). Rural location was negatively associated with both services (ORs= 0.66 and 0.76). For-profit facilities were 22 percent less likely to offer SSUT (OR=0.78) and 41 percent less likely to offer early intervention (OR=0.59). Provision of mental health services (OR=0.81) and religious affiliation (OR=0.63) were both associated with decreased odds of offering early intervention, while larger patient counts were associated with increased odds (OR=1.09). Joint Commission accreditation was marginally associated with early HIV intervention (OR=1.14).

At the county-level, higher rates of poverty and higher percentages of racial/ethnic minorities were associated with increased odds of offering early HIV intervention services (OR=0.91). Higher HIV prevalence was associated with increased odds of offering both SSUT (OR=1.10) and early intervention (OR=1.04). Larger numbers of same sex couples were marginally associated with increased odds of offering SSUT services (OR=1.03). At the state-level, a 10 percent increase in support for gay rights was associated with a 20 percent increase in the odds of offering early intervention services, while SAMHSA HIV designation was associated with about a 45 percent increase in odds of offering both SSUT (OR=1.46) and early HIV intervention services (OR=1.44).

Looking at preventive services for non-infected, at-risk populations, provision of mental health services and for-profit status was associated were negatively associated with providing HIV education (OR=0.65, OR=0.61) and HIV testing (OR=0.57, OR=0.50). Medicaid acceptance was associated with increased odds of providing both HIV education (OR=1.70) and HIV testing (OR=1.46). Religiously-affiliated facilities (OR=0.55; OR=0.60) and those located in rural areas (OR=0.85; OR=0.63) were less likely to offer education and testing, while larger numbers of patients were associated with increased odds (OR=1.11; OR=1.15). Facilities with Joint Commission accreditation were twice as likely to offer HIV testing (OR=2.09).

At the county-level, higher rates of poverty and percent racial/ethnic minority were associated with increased odds of offering HIV education (OR=1.22; OR=0.92) and HIV testing (OR=1.28; OR=0.87). Increased prevalence of HIV was associated with provision of HIV testing (OR=1.05) but not HIV education. Number of same-sex couples was not significantly associated with either service. At the state-level, facilities in SAMHSA HIV-designated states were more than 50 percent more likely to offer HIV education (OR=0.54) and 78 percent more likely to offer HIV testing. State-level support for gay rights was not associated with HIV education or testing.

Comparing facilities that offer services for HIV-positive individuals (SSUT and/or early HIV intervention) with those offering services for at-risk individuals (education and/or testing), provision of mental health services (OR=1.14) and Medicaid acceptance (OR=1.19) were associated with services for HIV-positive individuals. For-profit status was associated with offering only preventive services (OR=0.85). At the county-level, higher rates of poverty (OR=1.28) and higher HIV prevalence (OR=1.05) were associated with increased likelihood of offering services only for HIV-positive individuals compared to services for the at-risk. At the state-level, a 10 percent increase in support for gay rights was associated with a 28 percent increase in the likelihood of facilities offering services for HIV-positive persons compared to

offering only preventive services for the at-risk, even when controlling for county-level HIV prevalence and other factors.

DISCUSSION

Summary and implications

This study has implications for the accessibility of evidence-based substance use treatment for persons at-risk of HIV infection and for those with HIV that should be considered by policymakers. First, Medicaid acceptance by treatment facilities is a major predictor of provision of HIV-related services included in the study. This is not surprising, given that Medicaid is the source of coverage for about half of all people with HIV in regular care (Kaiser Family Foundation, 2011). Nonetheless, it demonstrates the importance of Medicaid coverage and how coverage decisions influence providers' decisions about what services to provide. Given that other sources of coverage – Medicare and private insurers – were not predictive of offering these services suggests that HIV-positive persons with these sources of coverage may not have adequate access to HIV-related services – both preventive and treatment-related – in the substance use treatment setting.

For-profit facilities were also considerably less likely to offer any HIV prevention services or treatment-related services for persons with HIV/AIDS. These results are consistent with previous studies finding that public and non-profit facilities tend to offer more wrap-around and ancillary services than private facilities. In addition, religiously affiliated facilities were much less likely to offer any HIV-related services. Previous research has identified correlation between religious views and higher levels of HIV stigma, stemming from moral judgment of the sexual activities and other behaviors that lead to transmission (Varas-Diaz et al., 2014). This finding suggests that persons with HIV may have reduced access to treatment with religious foundations, such as 12-step programs.

Providers located in rural locations were much less likely to offer HIV-related services. Individuals in rural areas have reduced access to substance use treatment in general (Fournety & Booth, 2001), and this may be compounded for individuals with HIV due to sparse populations and relatively low prevalence rates of HIV compared to more urban areas (CDC, 2012). Persons with HIV living in rural areas will likely be forced to travel long distances to access integrated HIV and substance use treatment services.

This study also reveals the very significant impact of the SAMHSA HIV designations of the provision of integrated HIV and substance use treatment services. The impact ranged from 44 to 78 percent increased odds of offering HIV-related services compared to facilities in non-HIV-designated states. While the program is based on high state-level prevalence, it is worth considering whether or not this designation is at a small enough geographic unit. State-level HIV prevalence masks considerable variation within states, and residents in states falling short of the 10 per 100,000 cut-off may have significant unmet needs. SAMHSA should consider expanding the program to include more states and/or basing designations on prevalence within smaller geographic areas.

Finally, the primary research question in this study asked if social climate for sexual minorities, measured through support for gay rights, was associated with provision of HIV-related services in substance use treatment. First, it is worth noting that the confidence intervals for estimates of the association of social climate with individual services were quite wide, and only one individual service reached significance. However, negative social climate was significantly associated with providing only preventive services for at-risk populations versus offering specialized treatment and early intervention for HIV positive individuals. When considered with previous research on the roots of HIV-related stigma and its relation to provider discrimination, these findings suggest that negative perceptions of sexual minorities (and particularly MSM) fuels HIV-related stigma and discrimination in substance use treatment settings, resulting in reduced

provision of and patient access to integrated HIV and substance use services for people with HIV. Policymakers should consider ways to counteract negative social climate through enhancements to the highly impactful block grant designation program, increased Medicaid reimbursements, and other means.

Limitations

This study has several limitations. First, the use of cross-sectional data limits the inferences that can be made from the results to associations; no conclusions can be made regarding causality of the relationships between the study variables. Longitudinal studies are needed to establish the causal effects of these factors in order to confidently make evidence-based policy decisions.

In addition, previous studies have questioned the validity of NSSATS questions on provision of services for specific groups, suggesting that question wording was leading to over-reporting of provision of these services (Cochran, Peavy, & Robohm, 2007). In response to these concerns, SAMHSA made adjustments to the questions by more clearly making a distinction between simply providing services to members of the particular demographic group versus offering specialized services designed to specifically meet the needs of that group. After this change, the portion of facilities reporting provision of these services decreased, suggesting increased validity. However, there is still the potential for incorrect responses to these questions in NSSATS.

There are also limitations related to the assessment of social climate. First, support for gay rights is an imperfect measure of negative perceptions of sexual minorities. Some prominent commentators have argued that not supporting gay rights, such as gay marriage, is not necessarily fueled by animus toward gay people, but may be a logical conclusion based on religious or moral beliefs (Saletan, 2014; Douthat, 2014). While negative perceptions of sexual minorities has been

linked to HIV-related stigma in several studies, it is an imperfect link. Further studies making a direct link between extent of negative perceptions of persons with HIV and provision of substance use treatment services are needed to confirm the results.

Conclusion

HIV-related stigma and discrimination, driven in part by animus towards sexual minorities, appears to negatively impact the delivery of integrated services for HIV positive individuals in substance use treatment centers. Other organizational and policy factors, including the SAMHSA policy for designation of block grant funding, were highly predictive of provision of HIV-related services. Federal and state policymakers should consider ways to encourage expanded provision of these services, including modifications to the HIV designation program and other funding sources.

Table 4-1. Descriptive Statistics		
	Frequency or mean (SD)	Percentage or range
<i>Facility-Level Variables</i>		
Provides any HIV-related services	4,992	59.87%
<i>Services for HIV-Positive Individuals</i>		
Provides any services for HIV-positive individuals (among 4,992 offering any HIV-related service)	2,292	45.91%
Provides specialized substance use treatment (SSUT) services for persons with HIV/AIDS	729	8.76%
HIV/AIDS early intervention services	2,012	24.17%
<i>Services for Populations at-Risk of HIV Infection</i>		
Provides HIV education	4,568	54.88%
Provides HIV testing	2,109	24.26%
Also provides mental health services	2,827	33.96%
For-profit	2,924	35.13%
Accepts Medicare	2,512	30.18%
Accepts Medicaid	4,543	54.58%
Accepts private insurance	5,240	62.95%
Joint Commission accredited	1,388	16.67%
Religiously affiliated	370	4.44%
Patient admissions	253.32 (288.01)	1 – 1441.69
<i>County-Level Variables</i>		
Percent Caucasian race	77.88 (15.47)	30.29 – 99.00
Percent living in poverty	14.61 (5.29)	3.4 – 30.51
Number of same sex couples	2,785 (4,743)	0 – 20,230
HIV prevalence per 100,000	343.18 (383.289)	11 – 1755.99
<i>State-Level Variables</i>		
Gay rights support	57.76 (6.38)	38 - 68
SAMHSA HIV Designated State	4,604	55.31%

Table 4-2. Regression Results						
	Provides Any HIV-Related Services Odds Ratios (95% CI)	Services for HIV-Positive		Services for Individuals At-Risk		Provides Services for HIV+ (=1) vs. At-Risk Only (=0) Odds Ratios (95% CI)
		Specialize d Subst. Use Tx Odds Ratios (95% CI)	Early HIV Intervention Odds Ratios (95% CI)	HIV Education Odds Ratios (95% CI)	HIV Testing Odds Ratios (95% CI)	
Facility-Level Variables						
Provides mental health services	0.63*** (0.56-0.70)	0.93 (0.77-1.12)	0.81*** (0.71-0.92)	0.65*** (0.59-0.73)	0.57*** (0.50-0.65)	1.14* (0.99-1.31)
For-profit	0.61*** (0.55-0.68)	0.78** (0.64-0.95)	0.59*** (0.52-0.67)	0.61*** (0.55-0.68)	0.50*** (0.43-0.57)	0.85** (0.74-0.98)
Accepts Medicare	0.94 (0.83-1.07)	1.02 (0.84-1.25)	1.01 (0.88-1.16)	0.93 (0.82-1.05)	0.95 (0.82-1.10)	0.99 (0.86-1.16)
Accepts Medicaid	1.64*** (1.45-1.85)	1.39*** (1.14-1.70)	1.43*** (1.25-1.64)	1.70*** (1.50-1.91)	1.46*** (1.27-1.69)	1.19** (1.03-1.38)
Accepts private insurance	0.92 (0.82-1.03)	1.03 (0.85-1.24)	1.01 (0.89-1.15)	0.93 (0.83-1.05)	0.91 (0.79-1.04)	1.08 (0.94-1.24)
Religiously affiliated	0.59*** (0.47-0.75)	0.90 (0.61-1.33)	0.63*** (0.48-0.84)	0.55*** (0.44-0.70)	0.60*** (0.45-0.80)	0.84 (0.61-1.14)
Rural location	0.84** (0.73-0.97)	0.66*** (0.49-0.88)	0.76*** (0.64-0.91)	0.85** (0.74-0.99)	0.63*** (0.51-0.77)	0.83* (0.69-1.00)
Joint Commission accredited	1.34*** (1.16-1.54)	0.83* (0.66-1.03)	1.14* (0.98-1.32)	1.09 (0.95-1.24)	2.09*** (1.80-2.43)	0.94 (0.80-1.11)
Patient admissions (quintiles)	1.10*** (1.06-1.14)	0.99 (0.94-1.05)	1.09*** (1.05-1.14)	1.11*** (1.07-1.15)	1.15*** (1.10-1.19)	1.03 (0.99-1.08)
County-Level Variables						
Percent Caucasian race (in 10s)	0.91*** (0.86-0.97)	0.97 (0.89-1.06)	0.91*** (0.86-0.97)	0.92*** (0.87-0.98)	0.87*** (0.79-0.94)	0.96 (0.90-1.03)
Percent living in poverty (in 10s)	1.25*** (1.09-1.43)	1.05 (0.89-1.32)	1.38*** (1.18-1.62)	1.22*** (1.04-1.40)	1.28*** (1.07-1.54)	1.28*** (1.10-1.52)
Same-sex couples (in 1000s)	1.01 (0.98-1.03)	1.03* (1.00-1.06)	1.02 (0.99-1.05)	1.02 (0.99-1.05)	1.00 (0.96-1.04)	1.02 (0.99-1.05)
HIV prevalence rate (in 100s)	1.03** (1.00-1.07)	1.10*** (1.06-1.14)	1.04*** (1.01-1.08)	1.02 (0.99-1.05)	1.05*** (1.01-1.09)	1.05*** (1.02-1.09)
State-Level Variables						
Support for gay rights (in 10s)	0.93 (0.77-1.12)	1.16 (0.95-1.43)	1.20** (1.01-1.43)	0.94 (0.77-1.14)	1.10 (0.87-1.39)	1.28*** (1.09-1.49)
SAMHSA HIV-designated state	1.55*** (1.20-2.02)	1.46*** (1.12-1.90)	1.44*** (1.14-1.82)	1.54*** (1.17-2.01)	1.78*** (1.29-2.46)	1.17 (0.95-1.43)
* = p < 0.10; **=p < 0.05; ***=P <0.01						

CHAPTER 5: IS SOCIAL CLIMATE ASSOCIATED WITH REDUCED ACCESS TO HEALTH SERVICES FOR SEXUAL MINORITIES? AN ANALYSIS OF SUBSTANCE USE TREATMENT

INTRODUCTION

While public perceptions of lesbians, gays, and bisexuals (LGBs) have changed rapidly in recent years, these individuals are still viewed negatively by large portions of the U.S. population. In a 2013 survey, only 54 percent of Americans reported having a favorable view of gay men and 58 percent reported a favorable view of lesbians (Pew Research Center for the People & the Press, 2013). Stigma and discrimination have negative health consequences for the LGB community, including higher rates of mental illness and substance use disorders (Meyer, 1995; Meyer, 2003). Studies on substance use prevalence support these findings, showing that gay men and lesbians are more likely to use alcohol and drugs than the general population (Ostrow & Stall, 2008; Hunt, 2012). The higher prevalence of substance use disorders among LGBs has been associated with being victims of discrimination (Herek & Garnets, 2007; Hunt, 2012).

There is evidence substance use treatment specially designed for LGBs is more effective than traditional treatment. SAMHSA (2009a) states that LGB-sensitive treatment, which has some level of focus on LGB issues, and LGB-affirming treatment, which is designed specifically for LGBs, are best practices for treating substance use in these populations. One study (Senreich, 2010b) found that LGB patients receiving treatment program designed for LGB individuals had significantly higher rates of abstinence after completion of the treatment than those LGB clients who were not in a specialized treatment. The same researcher also found that gay and bisexual men in traditional treatment were less likely to complete their treatment programs than heterosexual men and gay and bisexual men in specialized programs (Senreich, 2010a). Among those leaving treatment across the three groups, gay and bisexual men in the traditional programs

were more likely to have left treatment reportedly because their needs were not being met. The study also found that gay and bisexual men in specialized treatment programs had more favorable results for four variables in the perception of treatment including therapeutic support, honesty and openness, feelings of connection and satisfaction of treatment than gay and bisexual men in traditional treatment programs.

While these specialized services may be more effective, they are not widely available. Studies have found that LGBs have reduced access to care compared to the broader population and have identified discrimination in various provider settings as a contributing factor (Kaiser Family Foundation, 2014; SAMHSA 2009a). While there is evidence of overt discrimination experienced by LGBs, no studies have considered how negative perceptions may impact providers' decisions to provide services for LGBs. Using a national survey of substance use treatment facilities, this study evaluates the relationship between provision of services designed specifically for LGBs with estimates of the social climate for LGBs at the state- and federal-levels. Social climate is considered alongside demographic control variables and organizational factors identified by the literature as being generally associated with substance use treatment service provision.

LGB Discrimination in Health Care Settings

Despite more significant health care needs – especially in the areas of mental health and substance use – LGBs have more restricted access to health care services than heterosexuals (Kaiser Family Foundation, 2014). Studies indicate that experiences of discrimination in health care settings are not uncommon for LGBs. No studies were found that assessed LGB discrimination specifically in substance use treatment, but in a recent report, SAMSHA (2009a) noted that homophobia is present in substance use treatment settings in the form of “gay-bashing conversations and cynical remarks and jokes regarding gay sexual behaviors.”

A 2009 survey of more than 4,000 members of the LGB community found that a majority had negative experiences with the health care system (Lambda Legal, 2010). About eight percent of LGBs reported that they had been denied needed care because of their sexual orientation. More than 10 percent reported that health care professionals refused to touch them or used excessive precautions, while about 12 percent reported an experience of a health care professional blaming them for their health status. Another 10 percent reported that health care professionals had used harsh or abusive language, while another four percent reported professionals being physically rough or abusive. Overall, 56 percent of LGBs surveyed reported some discriminatory experience in a health care setting.

Another study surveyed 871 urban MSM in the United States and found that nearly 30 percent reported having little access to care and were strongly mistrustful of the health system. Those reporting discomfort disclosing their sexuality to their provider were significantly less likely to report regular access to care (McKirnan, DuBois, Alvy, & Jones, 2013). A separate study of older gay men found that 73 percent believed LGB-related discrimination exists in long-term care facilities (Addis, Davies, Greene, MacBride, & Shepherd, 2009).

Organizational Factors in Substance Use Service Delivery

In assessing the relationship of social climate with delivery of LGBs, it is essential to control for organizational factors that predict service delivery more broadly. A review of literature found several studies that assessed organizational predictors of the provision of ancillary, wraparound, and other services within substance use treatment centers. However, no studies were found that directly assessed these factors for services designed specifically for LGBs.

The profit-status of substance use treatment facilities is associated with the quantity and types of services provided. Public and non-profit facilities provide more primary care and mental

health services (Friedmann, Alexander, & D'Aunno, 1999), medical care and case management services, (Montoya, 2006) and access to newly released pharmacotherapies (Knudsen, et al., 2011) than private centers. They are also more likely to offer wraparound services such as transportation, employment assistance, childcare, social activities, and health education (Montoya, 2006; Ducharme, Mello, Roman, Knudsen, & Johnson, 2007). Patients in public and non-profit centers have longer individual sessions than those in for-profit centers (Wheeler, Fadel, & D'Aunno, 1992). Public centers provide more individual therapy as a percent of total services provided than non-profit and for-profit centers (Wheeler, Fadel, & D'Aunno, 1992). Finally, public centers are more likely to provide culturally competent services for racial and ethnic minorities (Howard, 2003a; Howard, 2003b).

For-profit centers are more likely than public and non-profit centers to offer “treatment on demand,” defined as being treated within 48 hours of initiation (Friedmann, Lemon, Stein, & D'Aunno, 2003). They also provide longer group sessions than public and non-profit centers (Wheeler, et al., 1992). However, they are more likely to turn patients away (Montoya, 2006; Friedmann, Lemon, Stein, & D'Aunno, 2003) and less likely to provide ancillary support services such as testing for HIV and other STDs, HIV education, counseling, and support, and special assistance to victims of domestic violence (Olmstead & Sindelar, 2004).

Insurance acceptance by facilities is also associated with service provision. Managed care has been found to reduce the use of inpatient substance use care (Steenrod, Brisson, McCarty, & Hodgkin, 2001) and to reduce costs in both the public (McCarty & Dilonardo, 2003) and private providers (Sturm, 2000). At the same time, having a higher percentage of patients with managed care is associated with turning more patients away (Friedmann, Lemon, Stein, & D'Aunno, 2003), offering fewer health education and preventive services, and providing less medical testing for HIV and other STDs (Wells, Lemak, & D'Aunno 2006; Olmstead, White, & Sindelar, 2004). Higher percentages of revenue coming from private insurance – either managed care or

traditional fee-for-service – and self-paying clients is associated with decreased odds of offering transportation and housing assistance (Chuang, Wells, & Alexander, 2011).

Acceptance of Medicaid has been shown to have significant effects on services provided at substance use treatment facilities. In all facilities – regardless of being private, non-profit, or government-run – Medicaid acceptance is associated with increased odds of offering discharge planning and social service linkages (McBride, Chiqui, Terry-McElrath, & Malatu, 2012). In for-profit and non-profit facilities, acceptance of Medicaid patients is also associated with increased odds of provision of child care services and transportation assistance, as well as increased odds of offering housing assistance in for-profit facilities and case management services at non-profit facilities (McBride, Chiqui, Terry-McElrath, & Malatu, 2012).

There is some evidence that religiously affiliated treatment programs offer different types of services and treatment orientations than traditional programs. One study found that religiously affiliated programs are more likely to have a 12-step orientation in goals and activities, while non-religious programs were more likely to provide cognitive behavioral therapy as part of treatment (McIlwraith, Kinner, & Najman, 2011). A separate study that religiously affiliated programs were more likely to be targeted at men, although the study only considered treatment centers that offered residential services. The study also found that staff in religious-affiliated programs were more focused on “structure and discipline” than readiness to enter the workforce (Neff, et al., 2006).

Finally, various organizations have accreditation programs that require facilities to meet a given set of standards regarding their service provision. Joint Commission accreditation is associated with increased provision of mental health services (Friedmann, et al., 1999), as well as physical examinations and routine medical care (Durkin, 2002) compared to non-Joint Commission-accredited substance use treatment facilities.

METHODS

Primary data source

The primary data source for this study was the 2009 National Survey of Substance Use Treatment Services (NSSATS), an annual census of substance use treatment facilities in the United States that is planned and directed by the Center for Behavioral Health Statistics at SAMHSA and fielded by Mathematica Policy Research. The NSSATS includes information on facility characteristics, patient population, and services offered. The survey includes all known U.S. substance use treatment facilities, excluding all prisons and jails, most solo practices, facilities offering only driving while intoxicated (DWI) services, and halfway houses.

In the 2009 survey, a total of 17,226 facilities were part of the survey. Of these facilities, 2,013 (11.7%) were either closed or determined to no longer offer substance use treatment services and were deemed ineligible for the survey. Among the 15,213 facilities that were eligible, 13,513 (88.8%) were included in the final survey. Among those not included, 1,004 did not respond for the survey (6.6% of those eligible). Others were not included due to being grouped with other partner facilities.

The following types of facilities were removed from the analysis due to significant differences in their focus, funding, and operation: Facilities that primarily focus on mental health services, facilities offering hospital inpatient services, facilities not offering outpatient services, facilities offering services only for driving under the influence (DUI) offenders, and facilities for which clients were counted by partner or parent facilities. In addition, 555 facilities had missing observations for the included variables. No pattern was seen in the missing observations, so these facilities were removed from the dataset. The final analytic dataset had a total of 8,324 facilities.

Dependent variable

The dependent variable is a binary measure for provision of specialized services and/or group treatment programs for gays and lesbians. The NSSATS questionnaire distinguishes between simply serving members of a particular population versus providing services specially designed for the population.

Independent variables

The key independent variables are county- and state-level measures of social climate. There are few data sources available that estimate social climate for LGBs. Most surveys assessing views toward LGBs are national and do not have sample sizes large enough to disaggregate to smaller geographic units with precision. Some state-level surveys exist, but are not directly comparable due to differences in survey questions and sampling methodology. Assessing county-level social climate in a comparable manner is even more challenging.

For these reasons, proxy measures were used to estimate both state- and county-level social climate. At the county-level, results from the 2008 presidential election were used. While an imperfect measure of social climate, surveys show that more than two-thirds of Democrats believe homosexuality should be accepted by society, while more than half of Republicans believe it should be discouraged (Pew Research Center for the People & the Press, 2013). Moreover, county-level presidential election results has been used as a proxy for LGB social climate by the Williams Institute, a think tank at UCLA that conducts research on sexual orientation (Gates, 2013).

At the state-level, estimates of public support for gay rights were used as a proxy, providing a more direct estimation of negative views of LGBs. The estimates were derived using multilevel regression and post-stratification (MRP) of data national surveys (Lax & Phillips, 2009a). MRP compensates for small within-state samples by using demographic and geographic

correlations for adjustment. All individuals in the survey, regardless of their location, yield information about demographic patterns that can be applied to all state estimates. The estimates for each demographic-geographic respondent type are then weighted by the percentages of each type in actual state populations to estimate the percentage of respondents within each state who have a particular issue position. The investigators used this method to estimate support for eight different gay rights or policies, including housing non-discrimination, marriage, adoption, and hate crimes. (Lax and Phillips, 2009a), which were averaged for an overall estimate of support for gay rights. This approach has been shown to produce better results than other methods, such as simply disaggregating national polls (Gelman & Little, 1997; & Phillips, 2009b; Park, Gelman, & Bafumi, 2006).

At the facility-level, binary dependent variables were included for acceptance of Medicare, Medicaid, and private insurance, for-profit status, Joint Commission accreditation, rural location (defined as being located outside a Metropolitan Statistical Area), provision of any mental health services, and religious affiliation. A categorical variable with five quintiles for total program admissions was also included to control for organizational size and resources. All organizational measures were derived from NSSATS.

In addition, demographic covariates were included at the county- and state-levels. Data on race/ethnicity and percent of the population living in poverty were taken from the 2010 U.S. Census. The Census does not ask respondents questions about their sexual orientation. The state-level measure of the LGB population came from estimates derived from over 200,000 interviews conducted by Gallup in 2012, in consultation with the Williams Institute (Gates & Newport, 2013). The survey asked if the respondent personally identifies as lesbian, gay, bisexual, or transgender. The margin of error for each state is ± 2 percentage points, except for a slightly larger margin of error for the District of Columbia. In addition, researchers have used a procedure to estimate the number of same sex couples in each U.S. county using Census data (The Williams

Institute, 2011). Same-sex couples are identified in households where the respondent describes his or her relationship with another adult of the same sex in the same as a “husband/wife” or “unmarried partner.” These numbers are then adjusted to account for the likelihood that a small portion of different-sex couples miscode the sex of a spouse or partner and are incorrectly counted as a same-sex couple.

Data analysis

A series of two- and three-level logistic regression models were used to estimate the odds of provision of services for LGBs. First, two-level models were fit to assess the association of county- and state-level LGB social climate with only organizational covariates. For both sets of models, demographic covariates were added iteratively to assess their relative impact on odds estimates and model fit. Variables measuring the size of the LGB population were added first, followed by the addition of covariates for race/ethnicity and SES.

Next, the two-level models were the basis for three-level models that assessed the association of social climate at one level while adjusting for demographic covariates at the other level. Finally, three-level models were fit that assessed social climate at both levels simultaneously. The inclusion of covariates at each level in the three-level models was informed by their improvement of the fit of the two-level models.

All models contained the full set of facility-level variables. For continuous variables, outliers were held to three standard deviations above or below the mean. Model fit was assessed using Akaike’s Information Criteria (AIC) and Bayesian Information Criteria (BIC), which allowed for the comparisons across both nested and non-nested models. Interaction terms were introduced to each model to assess effect modification between the size of the LGB population and social climate.

RESULTS

Descriptive statistics

Descriptive statistics are presented in Table 5-1. Of the 8,879 facilities in the dataset, about five percent offer specialized substance use treatment services for LGBs. Approximately 34 percent of facilities provide mental health services and about 34 percent were for-profit. Thirty-one percent of facilities accept Medicare, 55 percent accept Medicaid, and 64 percent accept private insurance. About one quarter of facilities are located in a rural area and 17 percent are accredited by the Joint Commission. The mean number of patient admissions in the previous year was about 250.

At the county-level, on average about 55 percent voted for Barack Obama in the 2008 presidential election. The mean number of same sex couples is 2,715. On average, 78 percent of county residents are white and 15 percent are living in poverty. At the state-level, support for gay rights averages about 58 percent and an average of about four percent of the population identifies as LGB. An average of 65 percent of the state residents were white and 15 percent were living in poverty.

Two-level regression models

Table 5-2 presents the results of the two-level regression analyses. Odds ratios for the facility characteristics were similar across all six two-level models. Provision of mental health services was associated with around one-third increase in the odds of offering special services for LGBs (ORs=1.33-1.35) and for-profit status was associated with about a 30 percent decrease in odds (ORs=1.25-1.32). Acceptance of private insurance (ORs=1.21-1.29) was marginally associated with increased odds, while Medicaid acceptance was marginally negatively associated (ORs=0.78-0.81). Medicare acceptance was not significant. Rural location (ORs=0.57-0.73) and Joint Commission accreditation (ORs=0.58-0.61) were both associated with decreased odds of

offering specialized services for LGBs. Religious affiliation was negatively associated but was not significant. The size of the patient population was also not statistically significant.

In the county-level analysis, the first model included only the percent voting for Obama in 2008 as a proxy measure for social climate. In this model, a 10 percentage point increase in voting for Obama was associated with about a one-quarter increase in the odds of offering LGB services (OR=0.24). With the addition of the number of same-sex couples in the second model, the increased odds from positive social climate dropped to 13 percent (OR=0.13) but was still highly significant. The third model added covariates for race and SES and the increased odds from positive social climate remained similar at 12 percent. The same sex couples covariates were significant (OR=0.07-0.08) in the second and third models, while the race and poverty covariates in the third model were not significant. Comparing AIC and BIC values, the second county-level model with only the LGB covariate had the best model fit.

Covariates were added to the state-level models in the same manner as the county-level models. The first state-level model included only percent support for gay rights as a proxy measure for social climate. Every 10 percentage point increase in state-level gay rights support was marginally associated with a 26 percent increase in the odds of providing LGB services (OR=0.26). However, when percent identifying at LGBT was added in the second model, the increased odds related to social climate dropped to 8 percent and was not significant. In this model, percent identifying as LGBT was highly significant, with a 10 percentage point increase in the LGBT population associated with a 27 percent increase in odds of providing LGB services (OR=0.27). When covariates for race and SES were added, the odds ratio related to social climate returned to a high level (OR=0.29) although was not statistically significant. Increases in the state poverty level were marginally associated with LGB service provision in the third model, while percent identifying at LGB was no longer significant. The best model fit was ambiguous,

with BIC preferring the first model with only the social climate measure while the AIC preferred the third model with the full set of covariates.

Interaction terms between size of the LGB population and social climate were introduced and were marginally significant in some models but not others. Similarly, comparisons of AIC and BIC values were inconsistent on whether or not the interaction terms improved model fit. Moreover, interpretation of interaction terms of continuous variables in multilevel logistic models is difficult and not always meaningful. For these reasons, models with interaction terms are not included in this paper as final models, but are included in Appendix F.

Three-level regression models

Table 5-3 presents results of the three-level regression models that build upon the two-level models presented above. The first set of models includes support for gay rights at the state-level with covariates spread across both levels. The second set of models adds support for Obama to the first set of models for a two-level measure of social climate. An additional set of models was fit that included county-level social climate only with covariates at the state-level, but these models did not significantly improve fit compared to the two-level county social climate models and are not included. The facility characteristics have very similar odds ratios across all three-level models, and the size and direction of the relationships is similar to those in the two-level models. The only changes in significance are seen in the insurance variables, which generally have lower p-values in the three-level models.

In the three-level models with state-level social climate only, percent support for gay rights is positively associated with LGB service provision but is not statistically significant. In the first state-level social climate model, which includes only a county-level measure of the size of the LGB population as a covariate, a 10 percent increase in gay rights support is associated with a 13 percent increase in the odds of providing LGB services (OR=1.13). The odds increases

with the inclusion of race/ethnicity and SES covariates at the county-level in the second model (OR=1.16) and the state-level in the third model (OR=1.26). Each of the models controls for the size of the LGB population at the county-level, with an additional 1000 same sex couples associated with about a nine percent increase in odds of LGB service provision (ORs=0.08-0.10). The county-level race and SES variables added in second model were not statistically significant and did not improve model fit over the model with only the LGB covariate, while the state-level race and SES covariates in the third model did improve fit compared to the model with only the LGB covariate according to AIC values. As in the two-level state analysis, the state-level poverty rate is marginally associated with LGB service provision (OR=1.06).

For the three-level models with both county- and state-level social climate, the county-level percent voting for Obama in 2008 was added to each of the three-level models described above. Once again, state-level support for gay rights was positively associated with service provision in all three models but was not statistically significant (ORs=0.04-1.15). In the first model with only the county-level LGB population covariate, county-level social climate was marginally associated with LGB service provision, with a 10 percentage point increase in voting for Obama associated with a nine percent increase in the odds of offering LGB services. The addition of county-level race and SES covariates in the second model did not improve model fit and neither was statistically significant. However, inclusion of the state-level race and SES covariates in the third model did improve model fit over the model with only the LGB covariate according to AIC values. In this model, county-level social climate was statistically significant, with a 10 percentage point increase in voting for Obama associated with a 10 percentage point increase in odds of offering LGB services.

DISCUSSION

Summary and implications

The results are not fully conclusive but suggest that social climate for sexual minorities is a predictor of whether or not substance use treatment centers offer specialized services for LGBs. While state-level support for gay rights was only significantly associated with providing these services in a model with no demographic covariates in a one-tailed test, the county-level measure is highly significant in nearly all models. The analysis suggests that a 10 percentage point improvement in social climate in the county in which a substance use treatment facility is located is associated with about a 10 percent increase in the likelihood that the facility offers services for LGBs. While the county-level measure is imperfect as a proxy for LGB social climate compared to the state-level measure of support for gay rights, it is approximating social climate in a much more highly defined geography that serves as the service area for the treatment facility.

LGB population size, race/ethnicity, and SES are appropriate control variables that, in most cases, improved model fit in the analyses. However, it is worth noting that these factors are at least somewhat correlated with social climate. Studies have shown that individuals that know someone who is LGB, which would be expected in areas with a greater concentration of LGBs, are more likely to support gay rights (Pew Research Center for the People & the Press, 2013). Similarly, support for gay rights tends to be higher among whites and individuals with higher SES (Langer Research Associates, 2014). Moreover, some of these demographic variables were used in the MRP method utilized to establish the state-level estimates. Inclusion of these demographic variables is useful in improving model fit and singling out the relative impact of social climate, but also has the potential to explain away social climate because they correlated. Estimating the association of negative social climate with reduced provision of services for LGBs – without controlling for community demographics – is useful in understanding the full extent of its suggested impact on patients. Put another way, from an individual patient's perspective, the

racial/ethnic makeup and poverty rate of the surrounding community almost certainly does not mitigate the experience of negative social climate.

These findings have policy implications not only for substance use treatment services, but also for health care services more broadly. A common response to reports of discrimination toward LGBs and other minority groups is to expand laws providing legal protections against discrimination. Increased discrimination protections at the local and state-levels may reduce instances of – or at least provide redress for – overt discrimination experienced in health care settings, but are unlikely to reduce more subtle forms of discrimination that reduce the likelihood of services being offered specially for LGBs. Policymakers may want to consider solutions that involve changes in health care financing and other incentives to overcome the impact of negative social climate.

LGBs are more likely to be covered by Medicaid than the broader population, so Medicaid acceptance by a facility would be expected to be positively associated with provision of LGB services. However, Medicaid acceptance was negatively associated with LGB service provision. This finding suggests that low-income LGBs may have especially poor access to specialized substance use treatment. It also suggests that, at present, state-level Medicaid policy decisions are not a factor in facilities' decisions about providing LGB services. Expanded Medicaid coverage and reimbursement for group treatment services would surely increase acceptance of Medicaid at treatment centers and provision of such services for LGBs, potentially counteracting the influence of social climate on a more local level. Additionally, public funding programs, such as SAMHSA's block grants to states, could require a certain amount of funds be spent on specialized services for LGBs to counteract negative social climate and increase the availability of these services.

Limitations

There are several limitations to the included measures and the study design that must be considered in evaluating the results. First, the use of cross-sectional data limits the inferences that can be made from the results to associations; no conclusions can be made regarding causality of the relationships between the study variables. Longitudinal studies are needed to establish the causal effects of these factors in order to make evidence-based policy decisions.

In addition, previous studies have questioned the validity of NSSATS questions on provision of services for specific groups, suggesting that question wording was leading to over-reporting of provision of these services (Cochran, Peavy, & Robohm, 2007). In response to these concerns, SAMHSA made adjustments to the questions by more clearly making a distinction between simply providing services to members of the particular demographic group versus offering specialized services designed to specifically meet the needs of that group. After this change, the portion of facilities reporting provision of these services decreased, suggesting increased validity. However, there is still the potential for incorrect responses to these questions in NSSATS.

There are also limitations which each of the social climate variables. Despite a correlation between political affiliation and views towards LGBs, presidential election results are an indirect measure of social climate for LGBs. Support for gay rights is a more direct proxy measure, as it ascertains opinions about LGBs directly, but it is certainly possible for individuals to be opposed to gay rights and not have negative views of LGBs. Some prominent commentators have argued that not supporting gay rights, such as gay marriage, is not necessarily fueled by animus toward gay people, but may be a logical conclusion based on religious or moral beliefs (Saletan 2014; Douthat 2014). Further studies making a direct link between extent of negative perceptions of LGBs and provision of substance use treatment services are needed to confirm the results.

Conclusion

Negative social climate appears to negatively impact the provision of evidence-based substance use services designed specifically for the LGB community, even when controlling for organizational factors in the treatment center and demographic characteristics of the surrounding area. Organizational factors such as insurance acceptance and profit status were highly predictive of provision of specialized services for LGBs. Policymakers should consider policies and programs to counteract negative social climate, such as changes to Medicaid reimbursement policy and providing grant funding designated for services designed specially for this population.

Table 5-1. Descriptive Statistics		
	Frequency or mean (SD)	Percentage or range
<i>Facility-Level Variables</i>		
Provides specialized substance use treatment services for LBGs	469	5.28%
Provides mental health services	3,037	34.20%
For-profit	3,064	34.51%
Accepts Medicare	2,712	30.54%
Accepts Medicaid	4,895	55.13%
Accepts private insurance	5,643	63.55%
Religiously affiliated	395	4.45%
Rural location	2,164	24.37%
Joint Commission accredited	1,465	16.50%
Patient admissions	250. 69 (287.32)	1 – 1442.89
<i>County-Level Variables</i>		
Social climate (Percent voting Obama in 2008)	54.85% (14.64)	12.40 – 93.42
Same sex couples	2,715 (4,717)	0 – 16,867
Percent Caucasian race	78.29 (15.95)	30.33 – 99.00
Percent living in poverty	14.61 (5.17)	3.40 – 30.55
<i>State-Level Variables</i>		
Social climate (Percent support for gay rights)	57.72 (6.39)	38 – 68
Percent identifying as LGBT	3.59 (0.66)	1.7 – 5.58
Percent Caucasian	65.19 (15.67)	22.7 –94.4
Percent living in poverty	14.86 (2.54)	8.3 –22.4

Table 5-2. Regression Results for Two-Level Models						
	County-Level Analysis			State-Level Analysis		
	Social Climate Only Odds Ratio (95% CI)	LGB Pop. Covariate Odds Ratio (95% CI)#	Full Covars. Odds Ratio (95% CI)	Social Climate Only Odds Ratio (95% CI)	LGB Pop. Covariate Odds Ratio (95% CI)	Full Covars. Odds Ratio (95% CI)#
Facility-Level Variables						
Provides mental health services	1.33*** (1.09-1.64)	1.34*** (1.09-1.64)	1.33** (1.09-1.64)	1.35*** (1.10-1.67)	1.35*** (1.10-1.67)	1.35*** (1.10-1.67)
For-profit	1.28** (1.04-1.58)	1.32** (1.07-1.63)	1.32** (1.07-1.63)	1.25** (1.01-1.55)	1.27** (1.02-1.57)	1.28** (1.04-1.59)
Accepts Medicare	1.18 (0.93-1.49)	1.20 (0.94-1.52)	1.19 (0.94-1.51)	1.21 (0.95-1.54)	1.21 (0.95-1.54)	1.21 (0.95-1.54)
Accepts Medicaid	0.78** (0.63-0.98)	0.81* (0.65-1.01)	0.81* (0.64-1.01)	0.78** (0.62-0.99)	0.79** (0.63-1.01)	0.80* (0.63-1.01)
Accepts private insurance	1.21* (0.97-1.50)	1.28** (1.03-1.59)	1.29 (1.03-1.60)	1.22* (0.98-1.53)	1.23* (0.99-1.54)	1.25** (1.00-1.56)
Religiously affiliated	0.79 (0.46-1.34)	0.81 (0.47-1.37)	0.80 (0.47-1.37)	0.82 (0.48-1.41)	0.81 (0.47-1.39)	0.82 (0.48-1.40)
Rural location	0.64** (0.48-0.86)	0.73** (0.54-0.98)	0.71** (0.52-0.97)	0.57*** (0.43-0.75)	0.57*** (0.42-0.75)	0.57*** (0.43-0.76)
Joint Commission accredited	0.58*** (0.42-0.78)	0.58*** (0.43-0.79)	0.58*** (0.42-0.79)	0.61*** (0.44-0.83)	0.61*** (0.45-0.83)	0.61*** (0.45-0.83)
Patient admissions (quintiles)	1.00 (0.94-1.07)	1.01 (0.94-1.08)	1.01 (0.94-1.08)	0.98 (0.92-1.05)	0.98 (0.92-1.05)	0.98 (0.92-1.05)
County-level Variables						
Social climate (% voting Obama in 08 in 10s)	1.24*** (1.15-1.34)	1.13*** (1.03-1.23)	1.12** (1.01-1.23)			
Same-sex couples (in 1000s)		1.08*** (1.05-1.11)	1.07*** (1.04-1.11)			
Percent Caucasian (in 10s)			1.00 (0.92-1.09)			
Percent living in poverty (in 10s)			1.08 (0.86-1.34)			
State-level Variables						
Social climate (% support for gay rights in 10s)				1.26* (0.98-1.63)	1.08 (0.82-1.43)	1.29 (0.92-1.81)
Percent Identifying as LGBT (in 10s)					1.27*** (1.06-1.51)	1.15 (0.96-1.37)
Percent Caucasian (in 10s)						0.94 (0.84-1.06)
Percent living in poverty (in 10s)						1.07* (1.00-1.15)
AIC	3570.7	3543.4	3546.0	3576.2	3571.51	3569.26
BIC	3655.8	3635.6	3653.4	3661.3	3663.65	3675.63
* = p < 0.10; **=p < 0.05; ***=P <0.01. # indicates that the model with an added interaction term is included in Appendix D.						

Table 5-3. Regression Results for Three-Level Models						
	State-Level Social Climate Analysis			Two-Level Social Climate Analysis		
	County-Level LGB Covar. Only Odds Ratio (95% CI)	County-Level Covars. Odds Ratio (95% CI)	County & State Covars. Odds Ratio (95% CI)	County-Level LGB Covar. Only Odds Ratio (95% CI)	County-Level Covars. Odds Ratio (95% CI)	County & State Covars. Odds Ratio (95% CI)#
Facility-Level Variables						
Provides mental health services	1.33*** (1.08-1.65)	1.34*** (1.09-1.66)	1.33*** (1.08-1.65)	1.34*** (1.08-1.66)	1.35*** (1.09-1.66)	1.34*** (1.09-1.66)
For-profit	1.28** (1.03-1.58)	1.29** (1.04-1.61)	1.29** (1.04-1.58)	1.29** (1.04-1.60)	1.29** (1.04-1.61)	1.30** (1.05-1.58)
Accepts Medicare	1.24* (0.97-1.58)	1.23* (0.97-1.57)	1.24* (0.97-1.58)	1.23* (0.97-1.57)	1.23* (0.97-1.57)	1.23* (0.97-1.57)
Accepts Medicaid	0.77** (0.61-0.98)	0.77** (0.60-0.97)	0.78** (0.62-0.99)	0.77** (0.61-0.98)	0.77** (0.60-0.97)	0.78** (0.62-1.00)
Accepts private insurance	1.35** (1.08-1.69)	1.37*** (1.09-1.71)	1.36*** (1.09-1.71)	1.36*** (1.08-1.69)	1.37*** (1.09-1.71)	1.37*** (1.09-1.72)
Religiously affiliated	0.84 (0.49-1.44)	0.84 (0.49-1.44)	0.84 (0.49-1.44)	0.84 (0.49-1.44)	0.84 (0.49-1.44)	0.84 (0.49-1.45)
Rural location	0.72** (0.53-0.97)	0.72** (0.52-0.99)	0.72** (0.53-0.97)	0.75* (0.55-1.03)	0.74* (0.53-1.02)	0.75* (0.55-1.03)
Joint Commission accredited	0.57*** (0.42-0.79)	0.57*** (0.42-0.78)	0.58*** (0.42-0.79)	0.57*** (0.42-0.78)	0.57*** (0.42-0.78)	0.57*** (0.42-0.79)
Patient admissions (quintiles)	1.00 (0.93-1.07)	1.00 (0.93-1.07)	1.00 (0.93-1.07)	1.00 (0.93-1.07)	1.00 (0.93-1.07)	1.00 (0.93-1.07)
County-Level Variables						
Social climate (% voting Obama 08 in 10s)				1.09* (0.99-1.21)	1.06 (0.93-1.07)	1.10** (1.00-1.21)
Same-sex couples (in 1000s)	1.10*** (1.06-1.14)	1.08*** (1.00-1.01)	1.09*** (1.05-1.13)	1.08*** (1.06-1.14)	1.08*** (1.00-1.01)	1.07*** (1.03-1.12)
Percent Caucasian (in 10s)		0.95 (0.86-1.04)			0.97 (0.87-1.08)	
Percent living in poverty (in 10s)		1.11 (0.86-1.44)			1.09 (0.84-1.42)	
State-Level Variables						
Social climate (% support for gay rights in 10s)	1.13 (0.89-1.44)	1.16 (0.91-1.49)	1.26 (0.93-1.70)	1.04 (0.80-1.36)	1.10 (0.83-1.45)	1.15 (0.84-1.58)
Percent Caucasian (in 10s)			0.96 (0.85-1.09)			0.96 (0.85-1.08)
Percent living in poverty (in 10s)			1.06* (0.99-1.14)			1.06* (0.99-1.11)
AIC	3528.2	3528.9	3527.3	3527.3	3530.1	3526.3
BIC	3627.5	3642.3	3640.73	3633.7	3650.7	3646.81
* = p < 0.10; **=p < 0.05; ***=P <0.01						
# indicates that the model with an added interaction term is included in Appendix D.						

CHAPTER 6: DISCUSSION

In the previous chapters, three manuscripts examined the relationships between organizational characteristics, state and federal policies, and social climate with the provision of specialized substance use treatment services based on gender, age, HIV status, and sexual orientation. This chapter summarizes the findings by revisiting the study's specific aims and research questions, discusses the implications of the results, highlights limitations and strengths of the study, and presents directions for future research.

SUMMARY OF FINDINGS

This study had three specific aims, which were separately addressed in the manuscripts contained in Chapters 3, 4, and 5, respectively:

1. Investigate the association between organizational factors and state Medicaid policies on provision of gender- and age-based substance use treatment services.
2. Investigate the association between organizational factors, federal policy, and social climate with provision of HIV-related services in substance use treatment, and
3. Investigate the association between organizational factors and county- and state-level social climate with provision of specialized services for LGBs in substance use treatment.

Aim 1 (Chapter 3): Gender and Age-Based Treatment

Specific Aim: Investigate the association between organizational factors and state Medicaid policies on provision of gender- and age-based substance use treatment services.

Research Question 1: Do organizational factors predict provision of gender- and age-based treatment services?

- Provision of mental health services, for-profit status, rural location, and Joint Commission accreditation were negatively associated with provision of any gender-based

treatment, while higher patient admissions, religious affiliation, and Medicaid acceptance were positively associated.

- For-profit status, Medicare acceptance, and Joint Commission accreditation were negatively associated with any age-based treatment, while provision of mental health services, Medicaid acceptance, private insurance acceptance, rural location, and higher patient admissions were positively associated.

Research Question 2: Does state Medicaid spending and coverage predict provision of gender- and age-based treatment services?

- Increased state per-beneficiary Medicaid spending on substance use treatment was positively associated with increased provision of gender-based treatment as well as specialized services for adult men and seniors.
- Medicaid coverage of outpatient substance use treatment was marginally positively associated with provision of age-based treatment and specialized services for adolescents.

Research Question 3: Are there differences in organizational and Medicaid policy predictors of provision of population-specific services across genders and age groups?

- Religious affiliation and increased state Medicaid spending on substance use treatment were associated with increased provision of services for adult men compared to women, while Medicaid acceptance and higher patient admissions were associated with increased provision of services for adult women compared to adult men.
- For-profit status, Medicare acceptance, and increased state Medicaid spending on substance use treatment were associated with increased provision of services for seniors compared to adolescents, while Medicaid acceptance, private insurance acceptance, and higher patient admissions were associated with increased provision of services for adolescents compared to seniors.

Aim 2 (Chapter 4): HIV-Related Treatment

Specific Aim: Investigate the association between organizational factors, federal policy, and social climate with provision of HIV-related services in substance use treatment.

Research Question 4: Do organizational factors predict provision of HIV-related services in substance use treatment?

- Provision of mental health services, for-profit status, and religious affiliation were negatively associated with provision of any HIV-related services, while Medicaid acceptance, Joint Commission accreditation, and higher patient admissions were positively associated.

Research Question 5: Does SAMHSA state HIV-designation predict provision of HIV-related services in substance use treatment?

- SAMHSA state HIV-designation is highly positively associated with provision of any HIV-related service, as well as HIV testing services, HIV education, early HIV intervention, and specialized substance use treatment for persons with HIV.

Research Question 6: Does social climate predict provision of HIV-related services in substance use treatment?

- More positive social climate was positively associated with increased provision of early HIV intervention.

Research Question 7: Are there differences in organizational, federal policy, and social climate predictors of provision of HIV preventive services for at-risk populations only versus provision of services for HIV-positive in substance use treatment centers?

- Among facilities offering any HIV-related services, provision of mental health services and Medicaid acceptance were positively associated with provision of services for HIV-positive persons compared to only offering HIV prevention services, while for-profit status was positively associated with provision of HIV prevention services only compared to offering services for HIV-positive persons.
- Among facilities offering any HIV-related services, declining social climate was highly associated with provision of only HIV prevention services compared to offering services for HIV-positive persons.

Aim 3 (Chapter 5): Sexual Orientation-Based Treatment

Specific Aim: Investigate the association between organizational factors and county- and state-level social climate with provision of specialized services for lesbians, gays, and bisexuals (LGBs) in substance use treatment.

Research Question 8: Do organizational factors predict provision of specialized services for LGBs in substance use treatment?

- Medicaid acceptance, rural location, and Joint Commission accreditation were negatively associated with provision of specialized services for LGBs, while provision of mental health services, for-profit status, and private insurance acceptance were positively associated.

Research Question 9: Does county-level social climate predict provision of specialized services for LGBs in substance use treatment?

- Declining county-level social climate, approximated by percent voting for Barack Obama in 2008, was highly associated with decreased odds of provision of specialized substance

use treatment services for LGBs even after controlling for organizational and demographic factors.

Research Question 10: Does state-level social climate predict provision of specialized services for LGBs in substance use treatment?

- Declining state-level social climate, approximated by percent support for gay rights, was associated with decreased odds of provision of specialized substance use treatment services, although this association was no longer significant after controlling for organizational and demographic factors.

DISCUSSION AND POLICY IMPLICATIONS

This section discusses the key factors identified in the study as influencing delivery of specialized services and how these results may impact service availability for various populations. The results also suggest a significant impact on service delivery from various state and federal policies. The expansion and modification of these policies is a potential solution for expanding the provision of specialized services.

Insurance acceptance is highly related to provision of services for specific populations, with the relationships typically aligning with individual populations' common sources of coverage. For instance, Medicaid acceptance was associated with delivery of specialized services for women, adolescents, and persons with HIV, while Medicare acceptance was associated with services for seniors. However, when an individual is covered by a less common source among their demographic (e.g., an adult male covered by Medicaid), they may face more limited availability of specialized services. This is particularly notable given coverage expansions under the ACA, which provides Medicaid coverage more widely to new populations such as adult men. However, this relationship between most common sources of coverage and delivery of specialized services for particular populations did not hold for all populations. Specialized

services for LGBs were positively associated with private insurance acceptance but negatively associated with Medicaid acceptance, although this population is more likely than the general population to be covered by Medicaid. This suggests limited availability of specialized services for the large portion of LGBs that have Medicaid coverage.

The results tied to profit status tended to align with the results from insurance acceptance, with traditional Medicaid populations tending to have higher likelihood of service availability in non-profit and public organizations and non-Medicaid populations more likely to find specialized services in for-profit facilities. (However, LGBs were again an exception; specialized services for LGBs were more likely to be provided in for-profit settings.) The literature review conducted for this study (see page 3) found strong evidence that non-profit facilities offer a much wider range of supplemental and wrap-around services (e.g., transportation, social services, and employment assistance), while for-profit facilities provided less of these types of services. This suggests that some populations seeking specialized services, such as seniors and LGBs, may have less access to comprehensive treatment that address multiple determinants of health.

Additionally, provision of mental health services was associated with provision of specialized services for LGBs, a population for which mental health issues are often tied to substance use. However, mental health services were negatively associated with provision of HIV-related services and specialized services for adult women, which are also populations for which substance use is strongly tied to mental health. This relationship represents a potential access issue for women with co-morbid mental health needs seeking gender-based treatment.

There has long been a relationship between substance use treatment and religion. The 12-step orientation, which as religious underpinnings, has demonstrated effectiveness and is the predominant approach in substance use treatment in the U.S. Its widespread use is evidence of the preference of many treatment seekers for religious-based treatment. However, this study

found that religiously-affiliated programs were more likely to offer specialized services for adult men but were less likely than non-religious programs to offer services for adult women and any HIV-related services. The reasons for these results are unclear, although are likely related to gender dynamics and roles and attitudes toward sexual activity in certain religions and particular Christian denominations. While the HIV analysis controlled for social climate at the state-level, this factor would likely not fully capture localized negative views of persons with HIV guiding decisions about treatment services in religious facilities. For both of these patient populations, the results represent a potential lack of access to evidence-based, patient-centered services within a religious context.

The results are not fully conclusive but suggest that social climate for sexual minorities is a predictor of whether or not substance use treatment programs offer specialized services for LGBs and persons diagnosed with HIV. The findings for HIV-related services were particularly robust and noteworthy. Negative social climate was associated decreased provision of services for HIV-positive individuals, but not for preventive services aimed at non-infected, at-risk populations. This finding adds to previous research on HIV-related stigma by tying negative perceptions of sexual minorities to providers' decisions to provide services to HIV-positive individuals. The findings for specialized services for LGBs were less conclusive, although did suggest that a relationship exists. For both LGBs and persons with HIV, residing in areas with negative social climate, in which discrimination and stigma are common, may trigger mental health issues and substance use in the first place. The suggested lack of availability of evidence-based substance use treatment specialized to meet their needs, which is another form of discrimination, is likely to negatively impact their recovery.

These findings on negative social climate have implications not only for substance use treatment services, but also for health care services more broadly. A common response to reports of discrimination for LGBs and other minority groups is to expand laws providing legal

protections against discrimination. Increased discrimination protections at the local and state-levels may reduce instances of – or at least provide redress for – overt discrimination experienced in health care settings, but are unlikely to reduce more subtle forms of discrimination that reduce the likelihood of services being offered specially for these populations. Other solutions will be necessary to reduce the impact of negative social climate and increase provision of specialized services for these populations.

The study results also identified the significant impact of state and federal policies on delivery of these services. These results suggest opportunities for expanding service delivery through Medicaid policy, as well as policies related to block grant funding from SAMHSA. Medicaid policymakers at the state- and federal-levels should consider coverage and reimbursement enhancements to drive wider provision of population-specific services for populations beyond traditional Medicaid populations such as women and children. Indeed, this study found that higher state-level per-capita Medicaid spending was positively associated with provision of specialized services for non-traditional Medicaid populations, including men and seniors. Enhanced Medicaid reimbursement could prompt non-profit and public facilities to provide specialized services to seniors and other groups, which might increase their access to a wider range of wrap-around and supplemental services. Moreover, enhanced reimbursement could help overcome the negative impact of social climate and stigma on provision of services for LGBs and persons infected with HIV.

SAMHSA and other funders of substance use treatment should consider grant funding and other vehicles for filling gaps across these populations. The SAMHSA HIV state designation, which requires states to commit at least five percent of their block grant funding to HIV-related services in substance use treatment, increased provision of HIV-related services by about 50 percent. The designation is based on state-level HIV prevalence of 10 per 100,000, and it is worth considering the appropriate cut-off for designation and whether or not this designation

is at a small enough geographic unit. State-level HIV prevalence masks considerable variation within states, and certain communities with HIV prevalence in states falling short of the designation cut-off may have significant unmet needs. SAMHSA should consider lowering the cut-off to include more states and/or basing designations on prevalence within smaller geographic areas that captures in-state variation, such as Metropolitan or Micropolitan Statistical Areas.

Due to the significant impact of the HIV designation, policymakers should consider implementing this substance use treatment block grant designation policy to increase provision of services for other vulnerable populations. Much like the HIV designation policy, these policies could require a range of services to meet the special needs of particular populations. For instance, while current policy does include a designation for pregnant women and women with dependent children, this policy could be expanded to require mental health services be delivered alongside substance use treatment services for women to provide comprehensive, integrated services for women with complex needs. A designation and block grant requirement could be established to better meet the needs of LGBs, as well. Such a policy could require specialized substance use treatment as well as STI/HIV preventive services and mental health services. Additionally, although not directly assessed in this study, the HIV designation may have mitigated the impact of negative social climate on delivery of HIV-related services. Designation policies for LGBs and other populations facing discrimination could help assuage the impact of negative social climate.

STUDY LIMITATIONS AND STRENGTHS

There are several limitations to the included measures and the study design that must be considered in evaluating the results. First, the use of cross-sectional data limits the inferences that can be made from the results to associations; no conclusions can be made regarding causality of the relationships between the study variables. Longitudinal studies are needed to establish the causal effects of these factors in order to make evidence-based policy decisions.

In addition, previous studies have questioned the validity of NSSATS questions on provision of services for specific groups, suggesting that question wording was leading to over-reporting of provision of these services (Cochran, Peavy, & Robohm, 2007). In response to these concerns, SAMHSA made adjustments to the questions by more clearly making a distinction between simply providing services to members of the particular demographic group versus offering specialized services designed to specifically meet the needs of that group. After this change, the portion of facilities reporting provision of these services decreased, suggesting increased validity. However, there is still the potential for incorrect responses to these questions in NSSATS.

There are also limitations which each of the social climate variables. Despite a correlation between political affiliation and views towards LGBs, presidential election results are an indirect measure of social climate for LGBs. Support for gay rights is a more direct proxy measure, as it ascertains opinions about LGBs directly, but it is certainly possible for individuals to be opposed to gay rights and not have negative views of LGBs. Some prominent commentators have argued that not supporting gay rights, such as gay marriage, is not necessarily fueled by animus toward gay people, but may be a logical conclusion based on religious or moral beliefs (Saletan 2014; Douthat 2014).

Despite these limitations, this study has several strengths that increase the relevance of the results and make the study an important contribution to the literature. First, it is one of the only studies to estimate the impact of negative social climate on provision of health services for vulnerable populations. Previous studies have primarily measured overt discrimination experienced by patients or assessed the views of providers; no studies were found that assessed the impact of negative social climate on decisions on whether or not to provide services for particular populations. The results have relevance for health services outside of substance use treatment and populations in addition to LGBs and persons with HIV. Second, the use of a

national survey of treatment centers with a very high response rate significantly increases the validity and generalizability of the results and their implications for policy at multiple levels, including state Medicaid policy and federal substance use treatment policy. Finally, the use of a multilevel modeling approach allowed for the consideration of county and state factors while accounting for the clustering of facilities in counties and counties in states, recognizing that there are similarities within such units that cannot be controlled for.

DIRECTIONS FOR FUTURE RESEARCH

The limitations and results of this study suggest areas for future research. First, the proxy variables used in this study limit the inferences that can be made about the results. Better data is needed to more accurately measure social climate and the size of the LGB population. A national survey with a sample size large enough to make state-level estimates with precision that asks direct questions about attitudes toward sexual minorities and persons with HIV would be needed to assess state-level social climate with a high degree of validity. Similarly, the Census Bureau should consider collecting and releasing county-level demographic data on sexual orientation and/or sexual activity to more reliably and validly estimate the size of the LGB population.

Additionally, the cross-sectional design does not permit the establishment of causality. Future studies using other research designs, such as longitudinal analysis, are needed to establish causal relationships between the dependent variables and delivery of services based on gender, age, sexual orientation, and HIV status. Such longitudinal studies would also increase understanding of how quickly the recent rapid changes in social climate are (or are not) translating into changes in the delivery of services for LGBs and persons with HIV.

Although lesbians, gays, and bisexuals were grouped in NSSATS and in this study, public attitudes and perceptions towards these groups differ. The survey on attitudes towards LGBs found that gay men are viewed more negatively than lesbians (Pew Research Center for the

People & the Press, 2013). At the same time, views on gender and race likely influence views toward female and minority LGBs. Moreover, this study excluded any analysis of social climate toward transgender individuals due to lack of data availability. Transgender individuals face even greater discrimination and more negative social climate than LGBs (Pew Research Center for the People & the Press, 2013). Future studies should consider differences across sexual orientations and gender identities in the effects of social climate on health service delivery and availability while also considering interactions with other forms of prejudice and discrimination, such as racism and sexism.

In addition, the study results help to identify future areas of scientific inquiry. Assuming a causal relationship between social climate and health care service delivery for sexual minorities and persons with HIV exists, little is understood about this relationship. Qualitative studies could help improve understanding of decision-making processes and how negative views of these and other vulnerable populations translate into programmatic and policy decisions that affect substance use treatment service delivery. For example, interviews and focus groups could establish whether the views of an organization's leadership matters most, or if they are responding to the views of their clients and communities. In addition, quantitative studies could be conducted to better understand the effect of the relationship and the relative influence of social climate. For example, a future study could assess the influence of social climate on the state and federal policies (e.g., Medicaid reimbursement and block grant funding) associated with service delivery decisions compared to the influence of social climate on organization's ultimate decisions.

Finally, the results beg the question of whether or not social climate towards LGBs and persons with HIV influences the provision and availability of health care services outside of substance use treatment. The most obvious service area for future research is mental health services, given the prevalence of mental health disorders in LGBs and persons with HIV and the

effectiveness of population-specific mental health services (Mustanski, Garofalo, & Emerson, 2010; Chandler, Himmelhoch, & Moore, 2006). In addition, HIV-related services are provided in a wide range of other settings, including hospitals, primary care clinics, and long-term care facilities. Additional studies could adapt the analytic framework used in this study and assess the role of negative social climate in provision of HIV-related services in these settings while controlling for organizational and demographic factors.

LGB-specific services are not as relevant or clinically supported in other health care service areas or clinical specialties compared to services for persons with HIV. However, negative social climate may influence the provision of health services for LGBs in other, less obvious ways, and additional studies are needed to assess these relationships. For instance, a health care system might not decide to open a clinic in an urban neighborhood with a large LGB population. Primary data collection or a qualitative approach would likely be necessary to assess these types of research questions due to current lack of data and the nature of the questions.

CONCLUSION

This study investigated the impact of organizational factors, state and federal policies, and social climate on provision of substance use treatment services specially designed to meet the needs of patients based on gender, age, HIV status, and sexual orientation. Multiple studies have found that substance use treatment designed to meet the particular needs of women, adolescents, seniors, persons with HIV, and LGBs are more effective than regular treatment. However, this study found that these services are not widely available in substance use treatment centers in the U.S. and that multiple factors influence treatment centers' decisions to provide these services.

Organizational characteristics including Medicaid acceptance and non-profit and public status were associated with provision of specialized services for some of the most vulnerable populations, including women, adolescents, and persons with HIV. On the other hand, services

for LGBs and seniors were more likely to be provided in for-profit centers and those accepting private insurance and Medicare, respectively. Treatment centers located in rural areas and those with religious affiliation were less likely to offer services for women and persons with HIV, while those providing mental health services were more likely to offer specialized services for LGBs and persons with HIV.

Social climate and state and federal policies were significant predictors of delivery of these services, as well. Overall, the results suggest that social climate negatively impacts delivery of services for HIV-positive individuals and specialized treatment for LGBs. Increased state Medicaid spending on substance use treatment was associated with increased provision of specialized services for smaller Medicaid populations, including adult men and seniors. In addition, SAMHSA state HIV-designation, which requires that a portion of block substance use block grant funding significantly increased provision of HIV-related services.

The impact of these policies suggests solutions for increasing provision and availability of specialized substance use treatment. State and federal Medicaid policymakers should consider reimbursement and coverage enhancements for substance use treatment that encourage these types of services. Moreover, SAMHSA should consider implementing additional block grant funding designations for services for other vulnerable populations with complex needs, such as LGBs.

APPENDICES

APPENDIX A: STUDY VARIABLES AND DATA SOURCES

Variable	Type	Description	Source	Coding
<i>Dependent Variables</i>				
anygender	Binary	Provision of any gender-based specialized substance use treatment services	NSSATS	0=No 1=Yes
womenservices	Binary	Provision of specialized substance use treatment services for adult women	NSSATS	0=No 1=Yes
menservices	Binary	Provision of specialized substance use treatment services for adult men	NSSATS	0=No 1=Yes
womenonly	Binary	Provision of specialized substance use treatment services for adult women among facilities providing only one gender-based service	NSSATS	0=Men Only 1=Women Only
anyage	Binary	Provision of any age-based specialized substance use treatment services	NSSATS	0=No 1=Yes
seniorservices	Binary	Provision of specialized substance use treatment services for seniors	NSSATS	0=No 1=Yes
adolservices	Binary	Provision of specialized substance use treatment services for adolescents	NSSATS	0=No 1=Yes
adolonly	Binary	Provision of specialized substance use treatment services for adolescents among facilities providing only one age-based service	NSSATS	0=Seniors Only 1=Adolescents Only
hivservices	Binary	Provision of specialized substance use treatment services for persons with HIV/AIDS	NSSATS	0=No 1=Yes
hivintervention	Binary	Provision of early HIV intervention services	NSSATS	0=No 1=Yes
hivedu	Binary	Provision of HIV education	NSSATS	0=No 1=Yes
hivtesting	Binary	Provision of HIV testing	NSSATS	0=No 1=Yes

Variable	Type	Description	Source	Coding
hivservprev	Binary	Provision of services for HIV positive persons (specialized substance use treatment services and/or early HIV intervention) versus provision of only preventive services for at-risk populations (HIV education and/or testing)	NSSATS	0=Services for At-Risk Only 1=Services for HIV Positive
lgbservices	Binary	Provision of specialized substance use treatment services for LGB persons	NSSATS	0=No 1=Yes
<i>Facility-level Independent Variables</i>				
medicaid	Binary	Accepts Medicaid	NSSATS	0=No 1=Yes
medicare	Binary	Accepts Medicare	NSSATS	0=No 1=Yes
privateins	Binary	Accepts private insurance	NSSATS	0=No 1=Yes
religion	Binary	Religiously affiliated	NSSATS	0=No 1=Yes
Joint Commission	Binary	Accredited by the Joint Commission	NSSATS	0=No 1=Yes
forprofit	Binary	Profit status	NSSATS	0=Non-profit/public 1=For-profit
admissionscat	Categorical	Number of annual admissions	NSSATS	0=0-59 1=59-115 2=115-200 3=200-382 4=382-1443
rural	Binary	Located in rural area; not located in a Metropolitan Statistical Area (MSA)	NSSATS	0=No 1=Yes
mentalservices	Binary	Provides mental health services	NSSATS	0=No 1=Yes

Variable	Type	Description	Source	Coding
<i>County-Level Independent Variables</i>				
obama0810	Continuous	Percent voting for Barack Obama in 2008 Presidential election	Atlas of U.S. Presidential Elections	in 10s
ss1000	Continuous	Number of same-sex couples (see detailed description on page 25.)	Williams Institute at UCLA	in 1000s
countyrate100	Continuous	Number of HIV infections per 100,000 individuals	Centers for Disease Control and Prevention, Division of HIV/AIDS Prevention and state health departments	in 100s
poverty10	Continuous	Percent of population under the Federal Poverty Level (FPL)	U.S. Census	in 10s
white10	Continuous	Percent of population identifying as Caucasian	U.S. Census	in 10s
<i>State-Level Independent Variables</i>				
medicaidout	Binary	Medicaid coverage of outpatient substance use treatment	Kaiser Family Foundation Medicaid Coverage Database; review of state plans	0=No 1=Yes
medicaidspendperbene100	Continuous	Total state Medicaid spending on substance use treatment divided by state Medicaid enrollment	U.S. Department of Health and Human Services (spending); Kaiser Family Foundation (enrollment)	in 100s
samhsa	Binary	HIV-designated state by SAMHSA; state HIV prevalence rate is greater than 10 per 100,000	SAMHSA	0=No 1=Yes
gayrights10	Continuous	Support for LGBT rights (see detailed description on page 24.)	Lax and Phillips, 2009a	in 10s
statepctpoverty10	Continuous	Percent of population under the Federal Poverty Level (FPL)	U.S. Census	in 10s
statewhite10	Continuous	Percent of population identifying as Caucasian	U.S. Census	in 10s

APPENDIX B: SERVICE PROVISION OVERLAPS ACROSS ALL PATIENT POPULATIONS

	Adult Men	Adult Women	Adolescents	Seniors	HIV SSUT	HIV Early Intervention	HIV Testing	HIV Education	LGB
Adult Men		85%	40%	18%	21%	30%	30%	63%	17%
Adult Women	61%		40%	15%	18%	31%	31%	64%	13%
Adolescents	28%	40%		9%	8%	21%	16%	55%	8%
Seniors	73%	81%	50%		51%	37%	29%	61%	50%
HIV SSUT	57%	67%	32%	35%		62%	56%	84%	39%
HIV Early Intervention	30%	43%	29%	9%	22%		58%	95%	10%
HIV Testing	29%	42%	23%	7%	20%	58%		88%	7%
HIV Education	28%	39%	34%	7%	13%	42%	39%		7%
LGB	75%	78%	50%	56%	63%	43%	31%	69%	

This chart shows the extent of service provision overlap among facilities included in the study. For an individual cell, the number represents the percent of facilities offering the service at the top of the column among facilities offering the service in the first column of that row. For example, among facilities offering specialized services for adult men, 85 percent also provide specialized services for adult women, 40 percent offer specialized services for adolescents, and 18 percent offer specialized services for seniors.

APPENDIX C: INSTITUTIONAL REVIEW BOARD APPROVAL MEMO



FWA #00000287

JHSPH Institutional Review Board Office

615 N. Wolfe Street / Suite E1100
Baltimore, Maryland 21205
Office Phone: (410) 955-3193
Toll Free: 1-888-262-3242
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NOT HUMAN SUBJECTS RESEARCH DETERMINATION NOTICE

Date: April 1, 2013

To: Russell Montgomery

Re: **PhD Dissertation - Student Project Title:** "Organizational, Social, and Policy Factors Associated with Provision of Patient-Centered Substance Abuse Treatment Services for Subpopulations"

The JHSPH IRB reviewed the *IRB Office Determination Request Form for Secondary Data Analysis* (received 3/29/13). We have determined that the proposed activity described in your request form will involve secondary data analysis of an existing, de-identified/de-linked, publicly available dataset, and neither you nor your project advisor, Dr. Shi, was involved in the original data collection. Thus, the proposed activity does not qualify as human subjects research as defined by DHHS regulations 45 CFR 46.102, and does not require IRB oversight.

You are responsible for notifying the JHSPH IRB of any future changes that might involve human subjects and require IRB review.

If you have any questions regarding this determination, please contact the JHSPH IRB Office at (410) 955-3193 or via email at irboffice@jhsp.h.edu.

/feb

cc: Leiyu Shi, DrPH, MBA, MPA
Project Advisor
Professor, Health Policy and Management

APPENDIX D: COMPARISON OF MODELS OF GENDER AND AGE-BASED SERVICES

Dependent Variable	Fit Criterion	Alternative Model #1	Alternative Model #2	Final Model
		1-Level Model with Organizational Factors	2-Level Model with Organizational Factors and State-Level Policy Factors	3-Level Model with Organizational Factors, County-Level Demographic Covars., and State-Level Policy Factors
Provides Any Gender-Based Service	AIC	10387.7	10211.56	10208.1
	BIC	10457.8	10302.7	10320.3
Provides Specialized Treatment for Adult Women	AIC	10027.1	9852.4	9851.6
	BIC	10097.2	9943.5	9963.8
Provides Specialized Treatment for Adult Men	AIC	8906.7	8694.8	8674.4
	BIC	8976.9	8786.0	8786.6
Provides only Specialized Services for Women (=1) vs. only for Men (=0)	AIC	1316.6	1315.67	1315.72
	BIC	1368.7	1383.3	1393.8
Provides Any Gender-Based Service	AIC	10582.0	10404.6	10360.8
	BIC	10652.1	10495.8	10473.0
Provides Specialized Treatment for Adolescents	AIC	10251.4	10062.9	10001.4
	BIC	10321.5	10154.1	10113.6
Provides Specialized Treatment for Seniors	AIC	3717.2	3682.7	3667.7
	BIC	3787.3	3773.8	3779.9
Provides only Specialized Services for Adolescents (=1) vs. only for Seniors (=0)	AIC	1591.2	1570.5	1551.7
	BIC	1650.7	1647.9	1646.9
Note: Shaded cells indicate best fit according to criterion.				

Regression Results for Alternative Model #2 – Gender-Based Services				
	Any Gender-Based Service Odds Ratio (95% CI)	Specialized Treatment for Adult Women Odds Ratios (95% CI)	Specialized Treatment for Adult Men Odds Ratio (95% CI)	Only Services for Women (=1) vs. only for Men (=0) Odds Ratio (95% CI)
<i>Facility-Level Variables</i>				
Provides mental health services	0.86*** (0.77-0.96)	0.88** (0.79-0.99)	0.94 (0.83-1.07)	0.95 (0.69-1.30)
For-profit status	0.71*** (0.64-0.80)	0.73*** (0.65-0.82)	0.89* (0.79-1.01)	0.78 (0.57-1.07)
Accepts Medicare	0.97 (0.86-1.10)	1.01 (0.90-1.15)	0.98 (0.85-1.12)	1.33 (0.92-1.94)
Accepts Medicaid	1.24*** (1.10-1.40)	1.34*** (1.18-1.51)	0.92 (0.80-1.05)	2.44*** (1.76-3.40)
Accepts private insurance	1.07 (0.96-1.20)	1.07 (0.96-1.21)	1.17** (1.03-1.33)	0.83 (0.61-1.14)
Religiously affiliated	1.35*** (1.08-1.69)	1.20 (0.95-1.51)	1.58*** (1.24-2.01)	0.53** (0.31-0.92)
Rural location	0.78*** (0.69-0.88)	0.81*** (0.72-0.92)	0.84** (0.73-0.96)	1.21 (0.85-1.72)
Joint Commission accredited	0.68*** (0.59-0.78)	0.70*** (0.61-0.81)	0.74*** (0.63-0.86)	1.13 (0.74-1.72)
Patient admissions (quintiles)	1.29*** (1.24-1.33)	1.31*** (1.26-1.36)	1.22*** (1.17-1.28)	1.21*** (1.10-1.34)
<i>State-Level Variables</i>				
Medicaid coverage of outpatient substance use treatment	1.14 (0.80-1.64)	1.24 (0.85-1.80)	1.07 (0.72-1.60)	1.40 (0.80-2.47)
Medicaid spending on substance use treatment per beneficiary (quintiles)	1.09** (1.00-1.18)	1.07* (0.99-1.16)	1.13*** (1.03-1.23)	0.88** (0.78-0.98)
* = p < 0.10; **=p < 0.05; ***=P <0.01				

Regression Results for Alternative Model #2 – Age-Based Services				
	Any Age- Based Service Odds Ratio (95% CI)	Specialized Treatment for Adolescents Odds Ratio (95% CI)	Specialized Treatment for Seniors Odds Ratio (95% CI)	Only Services for Adolescents (=1) vs. Only for Seniors (=0) Odds Ratio (95% CI)
<i>Facility-Level Variables</i>				
Provides mental health services	1.52*** (1.36-1.69)	1.53*** (1.37-1.71)	1.23** (1.00-1.51)	1.27 (0.93-1.72)
For-profit status	0.74*** (0.66-0.83)	0.74*** (0.66-0.83)	1.22* (0.99-1.51)	0.76* (0.55-1.05)
Accepts Medicare	0.85** (0.75-0.96)	0.83*** (0.73-0.93)	1.63** (1.29-2.06)	0.69** (0.48-0.97)
Accepts Medicaid	1.45*** (1.29-1.63)	1.60*** (1.41-1.81)	0.70*** (0.55-0.88)	2.23*** (1.57-3.17)
Accepts private insurance	1.43*** (1.28-1.61)	1.47*** (1.31-1.66)	1.08 (0.86-1.35)	1.54** (1.10-2.15)
Religiously affiliated	0.95 (0.75-1.19)	0.91 (0.72-1.16)	1.29 (0.84-1.97)	0.73 (0.40-1.35)
Rural location	1.31*** (1.16-1.47)	1.41*** (1.25-1.59)	0.73** (0.56-0.94)	2.48*** (1.63-3.78)
Joint Commission accredited	0.67*** (0.59-0.77)	0.65*** (0.57-0.75)	0.91 (0.70-1.18)	0.69* (0.47-1.01)
Patient admissions (quintiles)	1.13*** (1.09-1.17)	1.15*** (1.11-1.19)	0.96 (0.90-1.03)	1.16*** (1.05-1.28)
<i>State-Level Variables</i>				
Medicaid coverage of outpatient substance use treatment	1.52** (1.01-2.29)	1.60** (1.03-2.49)	1.16 (0.66-2.02)	1.30 (0.54-3.13)
Medicaid spending on substance use treatment per beneficiary (in 10s)	0.96 (0.87-1.05)	0.94 (0.85-1.04)	1.12** (1.01-1.25)	0.86 (0.72-1.03)
* = p < 0.10; **=p < 0.05; ***=P <0.01				

APPENDIX E: COMPARISON OF MODELS OF HIV-RELATED SERVICES

Dependent Variable	Fit Criterion	Alternative Model #1	Alternative Model #2	Alternative Model #3	Final Model
		2-Level Model with County-Level HIV Prevalence Only	3-Level Model with County-Level HIV Prevalence and State-Level Social Climate	3-Level Model with County-Level HIV Prevalence and State-Level Social Climate & SAMHSA Designation	3-Level Model with County-Level HIV Prevalence and Demographic Covars. and State-Level Social Climate and SAMHSA Designation
Provides Any HIV-Related Services	AIC	10524.9	10294.7	10285.7	10267.3
	BIC	10609.3	10393.0	10391.0	10393.7
Provides Specialized Substance Use Treatment	AIC	4636.9	4577.0	4572.0	4574.2
	BIC	4721.2	4675.4	4677.3	4700.7
Provides Early HIV Intervention	AIC	8681.4	8537.4	8530.6	8505.0
	BIC	8765.7	8635.7	8635.9	8632.4
Provides HIV Education	AIC	10811.5	10588.8	10551.2	10537.3
	BIC	10895.6	10657.2	10656.6	10663.7
Provides HIV Testing	AIC	8350.3	8017.0	8007.0	7986.4
	BIC	8434.7	8115.4	8112.4	8112.8
Provides Services for HIV Positive (=1) vs. for At-Risk Only (=0)	AIC	6717.1	6641.1	6641.2	6633.7
	BIC	6795.2	6732.3	6738.9	6750.9
Note: Shaded cells indicate best fit according to criterion.					

Regression Results for HIV Alternative Model #3						
	Provides Any HIV-Related Services Odds Ratios (95% CI)	Services for HIV-Positive		Services for Individuals At-Risk		Provides Services for HIV+ (=1) vs. At-Risk Only (=0) Odds Ratios (95% CI)
		Specialized Subst. Use Tx Odds Ratios (95% CI)	Early HIV Intervention Odds Ratios (95% CI)	HIV Education Odds Ratios (95% CI)	HIV Testing Odds Ratios (95% CI)	
Facility-Level Variables						
Provides mental health services	0.62*** (0.56-0.69)	0.93 (0.77-1.12)	0.80*** (0.71-0.91)	0.65*** (0.58-0.72)	0.56*** (0.49-0.65)	1.13* (0.98-1.30)
For-profit	0.60*** (0.54-0.68)	0.78*** (0.64-0.94)	0.58*** (0.51-0.66)	0.60*** (0.54-0.67)	0.49*** (0.43-0.57)	0.84** (0.73-0.96)
Accepts Medicare	0.94 (0.83-1.07)	1.02 (0.84-1.25)	1.02 (0.88-1.17)	0.93 (0.83-1.06)	0.95 (0.82-1.11)	1.00 (0.86-1.17)
Accepts Medicaid	1.65*** (1.46-1.86)	1.39*** (1.14-1.69)	1.43*** (1.25-1.64)	1.70*** (1.51-1.92)	1.46*** (1.27-1.69)	1.19** (1.03-1.38)
Accepts private insurance	0.91 (0.81-1.03)	1.01 (0.84-1.22)	1.00 (0.88-1.13)	0.93 (0.83-1.04)	0.89 (0.78-1.02)	1.07 (0.93-1.22)
Religiously affiliated	0.58*** (0.46-0.73)	0.89 (0.60-1.32)	0.62*** (0.47-0.82)	0.55*** (0.43-0.69)	0.59*** (0.44-0.79)	0.83 (0.61-1.14)
Rural location	0.88* (0.77-1.01)	0.64*** (0.49-0.84)	0.83** (0.70-0.98)	0.89* (0.77-1.01)	0.67*** (0.55-0.80)	0.89 (0.75-1.06)
Joint Commission accredited	1.34*** (1.16-1.54)	0.82* (0.66-1.03)	1.14* (0.98-1.32)	1.09 (0.95-1.24)	2.10*** (1.81-2.44)	0.94 (0.80-1.10)
Patient admissions (quintiles)	1.10*** (1.06-1.14)	0.99 (0.94-1.05)	1.09*** (1.05-1.14)	1.11*** (1.07-1.15)	1.14*** (1.10-1.19)	1.03 (0.98-1.07)
County-Level Variable						
HIV prevalence rate (in 100s)	1.08** (1.06-1.10)	1.13*** (1.10-1.16)	1.10*** (1.08-1.13)	1.07*** (1.05-1.09)	1.11*** (1.08-1.14)	1.09*** (1.06-1.11)
State-Level Variables						
Support for gay rights (in 10s)	0.86 (0.72-1.04)	1.16 (0.95-1.41)	1.09 (0.91-1.29)	0.88 (0.73-1.07)	0.99 (0.87-1.39)	1.19** (1.03-1.39)
SAMHSA HIV-designated state	1.60*** (1.23-2.08)	1.46*** (1.12-1.90)	1.47*** (1.15-1.86)	1.57*** (1.20-2.06)	1.87*** (1.34-2.59)	1.16 (0.94-1.43)
* = p < 0.10; **=p < 0.05; ***=P <0.01						

APPENDIX F: COMPARISON OF MODELS OF SERVICES FOR LGBS

Regression Results and Fit Statistics for Models with and without Interaction Terms						
	County-Level Social Climate Only Odds Ratios (95% CI)		State-Level Social Climate Only Odds Ratios (95% CI)		Two-Level Social Climate Odds Ratios (95% CI)	
Facility-Level Variables						
Provides mental health services	1.34*** (1.09-1.64)	1.35*** (1.09-1.64)	1.35*** (1.10-1.67)	1.35*** (1.10-1.67)	1.34*** (1.09-1.66)	1.35*** (1.09-1.67)
For-profit	1.32** (1.07-1.63)	1.32** (1.07-1.63)	1.28** (1.04-1.59)	1.29** (1.04-1.60)	1.30** (1.05-1.58)	1.31** (1.06-1.62)
Accepts Medicare	1.20 (0.94-1.52)	1.20 (0.94-1.52)	1.21 (0.95-1.54)	1.21 (0.95-1.53)	1.23* (0.97-1.57)	1.23* (0.97-1.56)
Accepts Medicaid	0.81* (0.65-1.01)	0.79** (0.63-0.99)	0.80* (0.63-1.01)	0.80* (0.63-1.01)	0.78** (0.62-1.00)	0.78** (0.62-0.98)
Accepts private insurance	1.28** (1.03-1.59)	1.28** (1.02-1.60)	1.25** (1.00-1.56)	1.24* (0.99-1.55)	1.37*** (1.09-1.72)	1.37*** (1.10-1.72)
Religiously affiliated	0.81 (0.47-1.37)	0.80 (0.47-1.37)	0.82 (0.48-1.40)	0.81 (0.48-1.39)	0.84 (0.49-1.45)	0.84 (0.49-1.44)
Rural location	0.73** (0.54-0.98)	0.68** (0.50-0.92)	0.57*** (0.43-0.76)	0.58*** (0.43-0.77)	0.75* (0.55-1.03)	0.70** (0.51-0.96)
Joint Commission accredited	0.58*** (0.43-0.79)	0.57*** (0.42-0.78)	0.61*** (0.45-0.83)	0.61*** (0.45-0.83)	0.57*** (0.42-0.79)	0.57*** (0.42-0.78)
Patient admissions (Quintiles)	1.01 (0.94-1.08)	1.01 (0.94-1.08)	0.98 (0.92-1.05)	0.98 (0.92-1.05)	1.00 (0.93-1.07)	1.00 (0.93-1.07)
County-Level Variables						
Social climate (% voting Obama 08 in 10s)	1.13*** (1.03-1.23)	1.07 (0.97-1.18)			1.10** (1.00-1.21)	1.05 (0.94-1.17)
Same-sex couples (in 1000s)	1.08*** (1.05-1.11)	0.99 (0.98-1.01)			1.07*** (1.03-1.12)	0.99 (0.97-1.01)
Social climate x same sex couples		1.01* (1.00-1.01)				1.01* (1.00-1.01)
State-Level Variables						
Social climate (% support for gay rights in 10s)			1.29 (0.92-1.81)	0.68 (0.26-1.75)	1.15 (0.84-1.58)	1.18 (0.86-1.61)
Percent identifying as LGBT (in 10s)			1.15 (0.96-1.37)	0.30 (0.05-1.96)		
Social climate x % identifying as LGBT				1.02 (0.99-1.05)		
% Caucasian (in 10s)			0.94 (0.84-1.06)	0.95 (0.85-1.06)	0.96 (0.85-1.08)	0.95 (0.84-1.07)
Percent living in poverty (in 10s)			1.07* (1.00-1.15)	2.11** (1.06-4.20)	1.06* (0.99-1.11)	1.87* (0.94-3.73)
AIC	3543.4	3541.5	3569.3	3569.4	3526.3	3525.6
BIC	3635.6	3640.7	3675.6	3682.8	3646.8	3652.2
* = p < 0.10; **=p < 0.05; ***=P <0.01.						
Note: Shaded cells indicate best fit according to criterion.						

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EDUCATION

- 2014 Doctor of Philosophy in Health Services Research and Policy**
Johns Hopkins University, Bloomberg School of Public Health
Baltimore, MD
- Dissertation Title: The Association of Organizational Characteristics, Policy Factors, and Social Climate with Delivery of Population-Specific Substance Use Treatment
- 2010 Master of Health Science in Health Policy**
Johns Hopkins University, Bloomberg School of Public Health
Baltimore, MD
- 2007 Bachelor of Arts in Politics**
Hendrix College
Conway, AR

RESEARCH AND PROFESSIONAL EXPERIENCE

Director, Office of Population Health Improvement, Maryland Department of Health and Mental Hygiene — Baltimore, MD, Nov 2014 – Present

- Lead State Health Improvement Process and advise department leadership on health care delivery reform efforts.

Project Lead, Prevention and Population Health Care Models Group, Center for Medicare and Medicaid Innovation, Centers for Medicare & Medicaid Services – Baltimore, MD, Apr – Oct 2014

- Led development of new delivery model in Medicare and Medicaid that creates linkages between medical care and social services for vulnerable populations.

Policy Advisor, Maryland Department of Health and Mental Hygiene
Baltimore, MD, Dec 2012 – Apr 2014

- Provided research support, content expertise and advice, and project management for health care delivery system reform efforts in Maryland.

- Lead researcher and writer of Maryland's State Health Innovation Model and Health Care Innovation Award (round 2) proposals to Center for Medicare and Medicaid Innovation at CMS.
- Reviewed literature on best practices in public health service delivery, write white papers, conduct data analyses, and made recommendations to department leadership.
- Reviewed proposed legislation, wrote position papers, prepared testimony, and advised Secretary and Deputy Secretary for Public Health on legislative issues.
- Served as Director of Governor's Council on Health Quality and Cost and served as primary staff for the Health Care Delivery Reform Subcommittee of the Maryland Health Care Reform Coordinating Council.

Policy Analyst, Maryland Department of Health and Mental Hygiene

Baltimore, MD, May – Dec 2012

- Review literature on best practices in health care delivery system reform health financing and write white papers. Brief Secretary and Chief Medical Officer on health reform issues.
- Serve as Director of Governor's Council on Health Quality and Cost, as well as Health Care Delivery Reform Subcommittee of the Health Care Reform Coordinating Council.

Research Assistant, Department of Health Policy and Management, JHU Bloomberg School of Public Health — Baltimore, MD, Aug 2011 – May 2012

- Conducted spatial/GIS analysis of price discounting in health plans across the U.S for Dr. Darrell Gaskin.

Graduate Fellow, Office of the Assistant Secretary for Planning and Evaluation (ASPE), U.S. Department of Health and Human Services — Washington, DC, Nov 2010 – Aug 2011

- Conducted quantitative analysis of effects of state enrollment simplification policies on child enrollment in Medicaid and CHIP and drafted reports.
- Assisted with the development of Essential Benefits Package regulations for Medicaid and private plans in state exchanges by conducting qualitative research on plans in each state.

Project Manager, Center for Medical Technology Policy

Baltimore, MD, Mar 2009 – Nov 2010

- Led effort to develop innovative payment models for the Athena Breast Health Network, a large scale, "rapid learning" cancer research system at the University of California.
- Provided primary qualitative research support on report to Medicare Payment Advisory Commission on capacity of Medicare program to utilize evidence-based medicine to inform payment and coverage policies.
- Developed guidance on designing comparative effectiveness studies for off-label uses of cancer drugs.

Management Analyst, Arkansas Department of Human Services (Medicaid program)

Little Rock, AR, Aug 2007 – Aug 2008

- Co-led the policy development process for new Medicaid Long-Term Care Partnership program.
- Projected enrollment numbers and adapted cost-effectiveness models for future evaluations.

Research Assistant (temporary), Arkansas Advocates for Children and Families

Little Rock, AR, May– Aug 2007

- Conducted quantitative and qualitative research on health disparities as a predictor of education outcomes.

TEACHING EXPERIENCE

Lead Teaching Assistant, Department of Health Policy and Management, JHU Bloomberg School of Public Health, Baltimore, MD

- Assessing Health Status and Patient Outcomes – 2nd Term, 2011
- New Frontiers in Gerontology – 3rd Term, 2012

Teaching Assistant, Department of Health Policy and Management, JHU Bloomberg School of Public Health, Baltimore, MD

- Quality of Medical Care – 1st Term, 2011

HONORS AND AWARDS

- Marilyn Bergner Award in Health Services Research, JHU Department of Health Policy & Management – April 2013
- Honors Pass, JHU Department of Health Policy and Management PhD Qualifying Exam – June 2011
- National Research Service Award (NRSA) Trainee, Agency for Healthcare Research and Quality – 2010-2012
- Comparative Effectiveness Research Leadership Award, Center for Medical Technology Policy – Nov 2010
- David A. Winston Health Policy Scholarship – April 2009
- Hendrix College President's Medal – May 2007
- William C. Buthman Politics Prize – May 2007
- Best Undergraduate Research Presentation, Arkansas Political Science Association – Feb 2007

PUBLICATIONS

Mullins CD, **Montgomery R**, Abernethy AP, Hussain A, Pearson SD, Tunis S. "Recommendations for Outcomes Studies of Off-Label Drugs Used to Treat Advanced Stage Cancer." In press, *J Natl Cancer Inst*.

Hoffman A, **Montgomery R**, Tunis SR, Aubry W. "How Best to Engage Patients, Doctors, and Other Stakeholders in Designing Comparative Effectiveness Studies. *Health Affairs* 2010; 29(10): 1834-1841

Mohr PE, Tunis SR, Sabharwal R, **Montgomery R**, Bergthold L. "The Comparative Effectiveness Research Landscape in the US and its Relevance to the Medicare Program." Prepared for the Medicare Payment Advisory Commission, 02/10.

Mullins CD, **Montgomery R**, Tunis SR. "Uncertainty in Assessing the Value of Oncology Treatments." *The Oncologist* 2010; 15(Supplement 1): 58-64

Barth JB, Nitta K, and **Montgomery R**. "What is Arkansas Doing to Attack the Achievement Gap?" Prepared for Arkansas Advocates for Children and Families, 02/08.

PROFESSIONAL ACTIVITIES

Member, AcademyHealth (2008 – Present)

PRESENTATIONS

“Community Integrated Medical Home: Integrating Public Health and Primary Care,” Maryland Learning Collaborative, Columbia, MD – November 2013

“Maryland’s Efforts to Reduce Health Care Costs and Improve Quality.” University of Pittsburgh Institute of Politics, Pittsburgh, PA – October 2013

“Community Integrated Medical Home: Integrating Public Health and Primary Care,” Maryland Hospital Association Board Meeting, Elkridge, MD – April 2013

“Effects of Enrollment Simplification Efforts on Medicaid and CHIP Enrollment,” AcademyHealth Annual Research Meeting, Orlando, FL – June 2012

“Racial and Ethnic Disparities in Use of Anti-anxiety and Antidepressant Medications by Level of Need.” AcademyHealth Annual Research Meeting, Seattle, WA – May 2011

“Selecting Comparators and Outcomes and Recruiting Patients for Outcomes Studies in Oncology,” International Society for Pharmacoeconomics and Outcomes Research (ISPOR), Atlanta, GA – June 2010

“Comparative Effectiveness Research in the United States,” presented to delegation from Dutch Ministry of Health, Institute of Medicine, Washington DC – February 2010

“What is Arkansas Doing to Attack the Achievement Gap?” Arkansas Political Science Association Annual Meeting, Fayetteville, AR – February 2008

“Economic Development or Public Sellout? A Tax Increment Financing Case Study and Reform Proposal,” Arkansas Political Science Association Annual Meeting, Conway, AR – February 2007; National Conference on Undergraduate Research, San Rafael, CA – April 2007