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What Explains Sexual and Gender Minority Health Disparities?

Exploring Social and Geographic Variation in Stigma, Health, and Resilience

A dissertation submitted in partial satisfaction of the
requirements for the degree Doctor of Philosophy
in Sociology

by

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June 2024

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March 2024

What Explains Sexual and Gender Minority Health Disparities?
Exploring Social and Geographic Variation in Stigma, Health, and Resilience

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by

Jason Alexander Budge

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VITA OF JASON ALEXANDER BUDGE
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ABSTRACT

What Explains Sexual and Gender Minority Health Disparities?

Exploring Social and Geographic Variation in Stigma, Health, and Resilience

by

Jason Alexander Budge

Sexual and gender minorities (SGM), a population which includes persons who consider themselves lesbian, gay, bisexual, transgender, and queer (LGBTQ+), were formally designated a “health disparity population” by the National Institutes of Health (NIH) in 2016 (Pérez-Stable 2016). In order to better understand what explains SGM health disparities and how we may better achieve health equity, I examine three aspects of SGM health and wellbeing in closer detail: 1) the effect of the Affordable Care Act’s Medicaid expansion on HIV viral suppression and HIV diagnoses, 2) the relationship of structural stigma (anti-transgender state policies) with transgender mental and physical health, and 3) the social determinants of transgender community connectedness and gender identity pride.

The first empirical chapter of this dissertation employs data from the Centers for Disease Control and Prevention to assess how the differential state-level implementation of the Affordable Care Act’s Medicaid expansion impacts HIV viral suppression and HIV diagnoses outcomes among White, Black, and Latinx individuals and gay, bisexual, and other cisgender men who have sex with men (GBMSM). I find a reduction in HIV diagnoses

among Latinx individuals in the Medicaid expansion states, but no effect on White or Black individuals or GBMSM. Despite some reduction, substantial health disparities remain in the post-expansion period, as White Americans continue to have the highest viral suppression and lowest diagnosis rate compared to Black and Latinx Americans.

The second empirical chapter uses the first national probability sample of transgender adults (TransPop) to evaluate the relationship between structural stigma and transgender mental and physical health. After linking respondents' state of residence with transgender-related policies in that state, I find that, on average, transgender respondents fare worse on mental and physical health outcomes compared to their cisgender peers without taking into account structural stigma. In addition, I find that greater exposure to structural stigma (i.e., more anti-transgender policies in respondents' state of residence) has a significant association with poorer mental health outcomes for transgender individuals only.

The third empirical chapter continues to use the TransPop data to focus on the social determinants of two resilience factors, transgender community connectedness (TCC) and gender identity pride. I find that 1) variation in gender identity and socioeconomic status within the transgender community is linked with differences in resilience; 2) therapy is strongly linked to both higher TCC and pride; and 3) childhood bullying is linked to lower gender identity pride as an adult. Building on the work of others who call on researchers to expand their focus from only disparities and negative outcomes (e.g., Colpitts and Gahagan 2016), I argue that TCC and pride are not only valuable as resilience factors, but as measures of transgender wellbeing, or what may be called “trans joy” or “gender euphoria” (Beischel, Gauvin, and van Anders 2022; shuster and Westbrook 2022).

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I. Introduction

Sexual and gender minorities (SGM) were formally designated a “health disparity population” by the National Institutes of Health (NIH) in 2016, based on evidence that they are disproportionately burdened by mental and physical health challenges (Pérez-Stable 2016). Sexual minorities are people whose behavior, attraction, or identity is distinguished from heterosexuality (Mishel 2019), while gender minorities are people whose gender identity does not align with their assigned sex at birth (Gender Identity in U.S. Surveillance [GenIUSS] 2014). This population includes people who consider themselves lesbian, gay, bisexual, transgender, and queer (LGBTQ+), but is not exclusive to these labels or identities (Pérez-Stable 2016). The NIH promulgated a research framework aimed at understanding and ameliorating health disparities in this population (NIH SGM Research Office 2021). This research framework shows that the health of SGM populations is influenced by four types of processes: societal, community, interpersonal, and individual (NIH SGM Research Office 2021, see Appendix A). In order to better understand what explains SGM health disparities and how we may better achieve health equity, I build upon the NIH health disparities framework by examining three aspects in closer detail: 1) health insurance policies’ effect on viral suppression and HIV diagnoses, 2) structural stigma’s relationship with transgender mental and physical health, and 3) the social determinants of transgender community connectedness and gender identity pride.

Together, the three empirical chapters of this dissertation investigate patterns of social and geographic variation in stigma, health, and resilience to better explain sexual and gender minority health disparities. The etiology of health disparities among sexual and gender minorities often leads to stigma. These populations are characterized by high levels of

stigmatization, meaning that they are often considered abnormal or deviant by themselves (internalized stigma), others (interpersonal stigma), and society (structural stigma). For this reason, it has been called a fundamental cause of health disparities (Hatzenbuehler, Phelan, and Link 2013). What the NIH research framework does not address is whether and how place and space influence SGM health disparities. All three empirical chapters include a geographic component to assess spatial variation within the United States. This focus on geography and stigma is motivated by the results of my previous work, which identified significant variation in attitudes toward gay men and lesbians across US states that correlated with state-level differences in educational attainment and religiosity (Budge 2023). Three contextual factors in the health disparities framework also vary by geography: 1) health insurance policies, such as Medicaid (Kaiser Family Foundation 2023); 2) structural stigma, as measured by discriminatory laws (Movement Advancement Project 2017, 2022); and 3) visibility and acceptance of the SGM community, as measured by the share of transgender adults (Herman, Flores, and O'Neill 2022).

Given the uneven landscape in these contextual factors, I expect that health and resilience outcomes for sexual and gender minorities will also be influenced by geography. These health and resilience outcomes include HIV viral suppression and diagnoses, days of poor physical and mental health, and transgender community connectedness and gender identity pride. The data come from the 2016-2018 TransPop survey (Meyer 2021), a nationally representative sample of transgender and cisgender Americans, as well as the Centers for Disease Control and Prevention 2008-2019 HIV/AIDS data (Centers for Disease Control and Prevention 2021). This dissertation examines how socio-geographic factors impact these outcomes of SGM health and resilience. In the following sections I elaborate

on the theoretical and empirical background of my research. I end the introduction with an outline of the three empirical chapters.

A. Background

1. Stigma and Gender

Much of the stigma we observe toward sexual and gender minorities can be ascribed to the way in which these individuals' gender expressions deviate from socially expected norms based on sex assigned at birth, thus creating a "discrediting" attribute that may be visible depending on the ability of the individual to pass as straight or cisgender (Goffman 1963). The culturally hegemonic perspective on sex and gender in Western societies is "biological determinism," meaning that people believe that "men" and "women" have unique behaviors, attitudes, and predispositions that are rooted in their biology or "natural differences" (West and Zimmerman 1987). Because of this, divergence from these biologically gendered scripts is seen as unnatural and therefore stigmatized. The social constructionist tradition of gender theory is well-suited to explaining this social phenomenon (Butler 1990; Kessler and McKenna 1978; West and Zimmerman 1987). This understanding of gender holds that gender is constructed in relation to other people via social interaction and can even be described as a "performance" (Butler 1990; Kessler and McKenna 1978; West and Zimmerman 1987). That is, gender is inherently a *social* phenomenon that takes meaning based on the cultural context and the interpersonal interactions someone has. Biological sex is almost never actually known in social situations; instead, we infer someone's sex category through their gender presentation (i.e., "social genitalia") (Kessler and McKenna 1978; West and Zimmerman 1987). Thus, using gendered heuristics, we can

assign sex categories based how we “do gender” in a social interaction (West and Zimmerman 1987).

Further refinement of the “doing gender” approach demonstrates that there are socially expected ways of performing “maleness” and “femaleness,” which we call masculinity and femininity. Masculinity and femininity are not static categories or reified objects someone either does or does not have; rather, they are enacted and produced through social interaction (Schrock and Schwalbe 2009). Hegemonic masculinity is the ideal to which all men are measured against and normatively evaluated by—even though most men do not actually embody it, they attempt through interaction to achieve it (Connell and Messerschmidt 2005). This hegemonic masculinity marginalizes men who enact “subordinated masculinities” such as gay men who are seen as more effeminate (Connell and Messerschmidt 2005). Indeed, hegemonic masculinity legitimates inequality between men and women by placing femininity as weaker (Connell and Messerschmidt 2005). “Manhood acts” help to legitimate men’s masculinities by bolstering their claim on hegemonic masculinity (Schrock and Schwalbe 2009). A manhood act is a form of doing gender that strengthens claims to masculinity—the form this takes depends on the type of masculinity the man is striving for (Schrock and Schwalbe 2009). However, being biologically male is not enough to claim status as a man, although it helps (Schrock and Schwalbe 2009). For example, gay or effeminate cisgender men are stigmatized more than if they were cisgender women because they transgress their expected gender performance (Schrock and Schwalbe 2009).

These socially expected gendered performances and the resulting stigma for deviations from them has particular importance in studying sexual and gender minority health. Link and Phelan (2001) outlined a sociological definition of stigma that is based on the “co-

occurrence” of five components. The first is “labeling” human differences; the second component is associating those differences with negative stereotypes; the third is cognitively separating “us” from “them”; the fourth component is that the now labeled, stereotyped, and separated group is discriminated against and/or loses status; and the fifth component of stigma is that it is wielded by those in power (Link and Phelan 2001:367). Sexual and gender minorities are historically and currently labeled, stereotyped, separated as “different,” discriminated against, and subordinated by the hegemonic cisgender heterosexual majority, thus meeting Link and Phelan’s sociological definition of a stigmatized group. Furthermore, sexual and gender minorities are “marked” with other discrediting attributes that occur at higher rates in this population, such as HIV diagnoses, depression and anxiety, and substance use. This stigmatized status is key to understanding sexual and gender minority health disparities. In the next section I discuss how to construe health disparities and theories for why sexual and gender minority populations experience worse health outcomes.

2. Theories of Health Disparities

Social and public health sciences have developed several theories for understanding differences in health outcomes attributable to social inequalities. At the most fundamental level are what are called health disparities. Braveman (2014) notes that while some in public health see disparities simply as differences in populations, she argues that health differences are not always health disparities. For example, Braveman comments that while older adults tend to have worse health than younger adults (a health difference), this would not generally be considered a health disparity (Braveman 2014). For Braveman (2014:2), social justice is “at the heart” of health disparities because they represent health differences that are

attributable to unfair social or economic differences. For example, differences in health that are attributable to marginalized social locations such as race or ethnicity, sexual orientation or gender identity, are what we would call health disparities.

Health equity, on the other hand, represents a commitment to reduce and eliminate health disparities (Braveman 2014). As the author states: “Health disparities are the metric we use to measure progress toward achieving health equity. A reduction in health disparities (in absolute and relative terms) is evidence that we are moving toward greater health equity.” (Braveman 2014:4). I highlight this work because it has a clear and concise discussion of health disparities and health equity, two terms that I use throughout this dissertation. To a lesser extent I use the terms “health inequalities” or “health inequities,” which I consider to be largely interchangeable with health disparities (typically when other authors have used those terms; e.g., fundamental cause theory prefers health inequalities as a term). However, in general, I intend their usage to mean health differences attributable to unfair socioeconomic advantage or disadvantage, marginalization, discrimination, or other forms of historic social oppression. Specifically, when discussing health disparities for sexual and gender minorities, I intend the term to mean that there exist health differences between sexual and gender minorities and the heterosexual and cisgender majority in the United States, and that these health differences are attributable to stigma, prejudice, and discrimination.

This dissertation is committed to health equity for sexual and gender minorities, and each chapter is intended to contribute to our understanding of how to better achieve health equity. In order to do so, I employ several theoretical frameworks for understanding health disparities among sexual and gender minorities. One is the NIH SGM health disparities

framework that I introduced above (NIH SGM Research Office 2021). This federal health framework is one basis for understanding the ecological factors above and beyond the individual that affect health disparities for SGM populations, including interpersonal, community, and societal factors. In my dissertation I examine numerous factors throughout this model. In Chapter II, the main focus is on health insurance policies as a societal factor, but other factors are related to the discussion of HIV disparities, including historic and ongoing trauma, access to PrEP, affirming patient-provider relationships, and insurance coverage and access. In Chapter III, I examine individual factors such as minority stress and societal factors such as structural stigma and transgender related policies. In Chapter IV, I explore resilience as a community and individual factor, specifically gender identity pride and relationship to gender minority communities.

As this framework demonstrates, there are many potential factors that influence sexual and gender minority health disparities. This makes achieving health equity for this population difficult, as closing gaps in health outcomes likely requires addressing multiple factors at once. In particular, stigma, discrimination, and prejudice are featured heavily in this framework as a reason for health disparities between SGM populations and cisgender heterosexual populations.

Stigma as a factor of SGM health disparities is further refined in fundamental cause theory. Fundamental cause theory was originally conceptualized to explain how socioeconomic inequalities continually produce health inequalities despite improvements in health technologies (Link and Phelan 1995). It has been expanded to other concepts such as racism and stigma for explaining perpetual health disparities among racial and ethnic minorities and sexual and gender minorities, respectively (Hatzenbuehler et al. 2013; Phelan

and Link 2015). Social inequalities due to socioeconomic status, racism, and stigma are conceptualized as fundamental causes of health inequalities because of the reproduction of these health inequalities over time “despite dramatic changes in diseases, risk factors, and health interventions” (Hatzenbuehler et al. 2013:813). This can be explained by the way that resources are wielded to avoid the worst health outcomes, such as through access to better social networks, better equipped health facilities and providers, and privilege that shields certain individuals from prejudice and discrimination (Hatzenbuehler et al. 2013).

Collectively, these kinds of social mechanisms reproduce health inequalities. This means that unless social inequalities themselves are addressed, health inequalities will likely persist regardless of public health interventions (Hatzenbuehler et al. 2013). There are a variety of mechanisms through which stigma specifically affects health outcomes. For example, individuals may not seek medical care for stigmatized diseases, such as HIV or schizophrenia, thus jeopardizing their health and wellbeing (Hatzenbuehler et al. 2013). Another major mechanism of health inequality due to stigma is stress, as outlined by the minority stress theory (Meyer 1995, 2003).

Minority stress theory argues that sexual and gender minorities are at increased risk for mental and physical health challenges due to their stigmatized minority status. The framework originally focused on sexual minorities, and sought to explicate why LGB individuals have a higher prevalence of mental health disorders, including depression and anxiety, than heterosexuals (Meyer 1995, 2003). Meyer (2003) argues that this is because of internalized homophobia, perceived stigma, and actual incidents of discrimination, and the collective effect of these stressors leads to higher chronic stress. In turn, increased stress is linked to negative health outcomes (Thoits 2010). Others have argued that it is not only

minority specific stressors such as internalized homophobia that increase stress among sexual minorities, but that everyday stressors that affect all people may be exacerbated among sexual minorities due to worse ability to cope with them or because the effect is heightened due to the stigma-related stress (Hatzenbuehler 2009). This framework has been extended to gender minorities, and has largely reproduced the same empirical evidence supporting the minority stress theory in transgender populations (Bockting et al. 2013; Hendricks and Testa 2012; McLemore 2018).

At the same time, minority stress theory has adapted to incorporate coping mechanisms and theories of resilience that demonstrate strengths within sexual and gender minority populations (Meyer 2003, 2015). Resilience is an important component of the minority stress model (Meyer 2015). This can include group-level factors such as social support, community connectedness, and family acceptance, as well as individual factors such as self-acceptance and pride (Matsuno and Israel 2018). Others have linked these resilience factors to improved outcomes, including wellbeing and reduced psychological distress (Barr, Budge, and Adelson 2016; Budge, Adelson, and Howard 2013). These theories of resilience provide a way to think about achieving health equity. I employ these theories of health disparities throughout this dissertation. In particular, Chapter II utilizes fundamental cause theory; Chapter III, minority stress; and Chapter IV, resilience. Before discussing the dissertation outline, I elaborate on the empirical literature on sexual and gender minority health disparities in the next section.

3. LGBTQ+ Health Disparities in the United States

Hsieh and Shuster (2021) offer a detailed overview of the literature to date on sexual and gender minority health and health care. Sexual and gender minority individuals experience

inequalities in both health care and health outcomes, and even within SGM populations, bisexuals, sexual minority women, and gender nonbinary individuals experience worse outcomes (Dahlhamer et al. 2016; Everett and Mollborn 2014; Hsieh and shuster 2021; Paine 2018). Other axes of discrimination and oppression, such as racialized identities, further contribute to how an SGM individual experiences health and health care (Hsieh and shuster 2021).

With respect to health care, in general, sexual and gender minorities are “more reluctant to seek care, to not see a regular health care provider, and to skip medication or other needed treatment compared to their cisgender and heterosexual counterparts” (Agénor et al. 2014; Dahlhamer et al. 2016; Hsieh and Ruther 2017; Hsieh and shuster 2021:320). A major reason is because of stigma. Physicians and other health care providers may explicitly or implicitly enact stigma, or they may be well-intentioned but simply do not have the cultural competency or medical education to appropriately work with SGM individuals (Hsieh and shuster 2021). This can cause SGM individuals to avoid or delay medical care that would put them at risk of being judged or discriminated against (Agénor et al. 2015; Cruz 2014; Hsieh and shuster 2021; Poteat, German, and Kerrigan 2013). As noted above, stigma is a fundamental cause of health disparities, partially because of this effect it has on health care. The barriers to health care for sexual and gender minorities can also include health insurance policies themselves, which directly influence the ability of individuals to access health care services. As Hsieh and shuster (2021) explain and as I explore in Chapter II, the health insurance landscape in the US is a patchwork of different and evolving policies, including SGM-specific coverage (Bakko and Kattari 2021; Gonsalves 2024) and Medicaid expansion (Kaiser Family Foundation 2023).

Sexual and gender minority health behaviors and outcomes are also characterized by disparities compared to their heterosexual and cisgender peers. For example, Hsieh and Shuster (2021) cite numerous studies that document how SGM individuals experience “higher rates of tobacco, alcohol, and drug use” (Boehmer et al. 2012; Conron, Mimiaga, and Landers 2010; Hsieh and Shuster 2021:324; McCabe et al. 2009; Reisner et al. 2015). These health behaviors likely lead to worse health outcomes in this population due to the deleterious effect excessive substance use has on the body. Minority stress theory, as elaborated above, is one explanation for these higher rates of substance use, as the effect of stigma, discrimination, and stress lead some SGM individuals to cope using substances (Hsieh and Shuster 2021; Meyer 2003). Of course, this is not true for all SGM individuals. Many also find community with other SGMs who experience stigma and find that helps with coping and building resilience (Meyer 2015).

Transgender individuals face particularly daunting health challenges. A recent review of the state of transgender health disparities demonstrates that transgender people face disparities in self-rated health and disability, mortality due to suicide, homicide, and HIV/AIDS, cardiovascular disease, cancer, anxiety, depression, and suicidal thoughts, and a higher HIV/AIDS burden among Black and Latinx transgender women who have sex with men (Scheim et al. 2022). This review also identifies several components of the social context of transgender health. Gender affirmation, otherwise known as transition, can be achieved “psychologically (by self-identifying and/or rejecting stigma), socially (by changing their name, pronouns, and/or gender expression), medically (with hormones, surgery, and/or hair removal), or administratively or legally (by correcting their gender

marker and name on documents and records).” (Scheim et al. 2022:507) When their gender is not affirmed, this causes stress, as indicated in the minority stress hypothesis.

Other studies have empirically examined gender non-affirmation. Interestingly, in a study that examined how transgender respondents’ gender was classified by their voice, they found that misgendered transgender men report worse self-rated health compared to correctly gendered transgender men, while misgendered transgender women actually reported better self-rated health compared to correctly gendered transgender women (Lagos 2019). In other words, being gendered based on voice as a “woman” in either population was correlated with worse self-rated health (Lagos 2019). As the author speculates, this may be due to a societal prejudice toward femininity in general, regardless of correct gendering (Lagos 2019). Even so, gender non-conforming individuals tend to have the worst health disparities within the transgender population (Lagos 2018; Miller and Grollman 2015; Streed, McCarthy, and Haas 2018). This may be due to societal enforcement of binary gender norms, such that individuals who fall outside this binary are likely to encounter heightened stigma, rejection, and misgendering.

In summary, sexual and gender minority populations experience disparities in health and health care. In particular, transgender individuals tend to have starker health disparities, even compared to sexual minorities. This dissertation builds on these findings by examining HIV and health care, structural stigma and transgender health, and transgender resilience. I summarize the dissertation in the following section, where I provide an overview of each chapter and briefly discuss the methods and results.

B. Dissertation Outline

1. Chapter II. Medicaid Expansion and HIV/AIDS: Increased Enrollment, Persistent Disparities

The first empirical chapter of this dissertation focuses on HIV/AIDS and health insurance. HIV/AIDS disproportionately affects segments of the sexual and gender minority population. Gay, bisexual, and other men who have sex with men (GBMSM) represented 71% of new HIV diagnoses in 2021—Black GBMSM represented 25% and Latinx GBMSM represented 23% of new diagnoses (HIV.gov 2023). Transgender women represented an additional 2% of new HIV diagnoses in 2021 (HIV.gov 2023), approximately 45% of whom are Black and 31% are Latinx. People living with HIV are primarily insured by Medicaid, the federal health insurance program for low-income Americans (Dawson et al. 2023).

I focus on how viral suppression and HIV diagnoses outcomes among White, Black and Latinx individuals and GBMSM are impacted by differential state-level implementation of the Affordable Care Act's Medicaid expansion. The Affordable Care Act (ACA) attempted to expand Medicaid in all states to include adults with incomes up to 138% of the federal poverty line. However, due to a Supreme Court decision, it was left up to the states whether or not to implement this expansion. Because of this, only half of states expanded Medicaid at that time, and more joined over the years since the ACA was passed (Kaiser Family Foundation 2023). Given that only some states expanded Medicaid and others did not (Kaiser Family Foundation 2023), my hypothesis is that HIV outcomes would improve over time in the states that expanded Medicaid. This is because health care services to low-income individuals are essential in combating the HIV epidemic.

Health care provides access to important services such as pre-exposure prophylaxis (PrEP), anti-retroviral therapy (ART), HIV testing, and access to a primary care provider. PrEP is a daily pill that prevents contraction of HIV if the patient is HIV negative and prevents the transmission of HIV if the patient is HIV positive. ART is a lifesaving treatment that prevents death from AIDS. It also prevents transmission of HIV because it reduces the viral load to undetectable levels. HIV testing helps to identify people who are positive and can get them on PrEP or ART to prevent further transmission. Finally, primary care providers are important for recommending all three of the above interventions.

I employ data from the Centers for Disease Control and Prevention on viral suppression and HIV diagnoses. Viral suppression is measured as the percent of people with an HIV diagnosis who received a CD4 or viral load test and received results that indicated their viral load was <200 copies/mL. These data are measured from 2012-2019. HIV diagnoses are measured as the rate of diagnoses per 100,000 state residents, from 2008-2019.

I find a reduction in HIV diagnoses among Latinx individuals in the Medicaid expansion states, but no effect on White or Black individuals or GBMSM. Despite this reduction, substantial health disparities remain in the post-expansion period, as White Americans continue to have the highest viral suppression and lowest diagnosis rate compared to Black and Latinx Americans. Persistent health disparities even with an expansion of health care access leads me to suggest that racism and stigma are operating as fundamental causes of HIV disparities (Hatzenbuehler et al. 2013; Phelan and Link 2015). Interventions that explicitly target racism and stigma are likely necessary to achieve health equity in HIV/AIDS outcomes in the United States. This research bolsters our understanding of the interplay between different facets of the NIH SGM health disparities framework. In this

case, societal-level insurance policies appear to be less important than other potential avenues for intervention, such as SGM-specific health care.

2. Chapter III. Structural Stigma and Transgender Health: Testing the Minority Stress Hypothesis across the United States

In this chapter, I study how structural stigma affects the mental and physical health of gender minorities. Gender minorities are particularly stigmatized. Americans are more hostile toward transgender people than sexual minorities such as gay men, lesbians, or bisexuals (Lewis et al. 2017). Transgender people are four times more likely to be victims of violent crime than cisgender people (Williams Institute 2021), and these hostile attitudes are associated with higher rates of attempted suicide (Clements-Nolle, Marx, and Katz 2006). Politicians also target transgender people for discrimination (e.g., Texas prosecuting parents for child abuse for providing gender-affirming care to their transgender children; North Carolina's law that restricted transgender people using bathrooms consistent with their gender identity). This prejudicial environment can influence gender minority health through minority stress (Hendricks and Testa 2012; Meyer 1995, 2003), as discussed above. The individual may internalize transphobia, perceive stigma toward themselves, or experience actual incidences of discrimination in numerous settings such as health care, housing, or employment, including transgender-specific stressors such as misgendering (Bradford et al. 2013; Hendricks and Testa 2012; McLemore 2018). The increased stress from these experiences is linked to increased frequency of psychiatric disorders (e.g., anxiety and depression), deleterious behaviors (e.g., substance use, drinking, and smoking), and poorer perceptions of personal health (Griffin et al. 2019; Hatzenbuehler et al. 2013; Hunter, Butler, and Cooper 2021).

I hypothesize that gender minorities living in environments with more discriminatory anti-transgender laws (i.e., greater structural stigma) will have worse mental and physical health outcomes than 1) cisgender heterosexuals living in the same area and 2) gender minorities living in more accepting environments. I test these hypotheses using the restricted dataset of the TransPop survey (Meyer 2021). This is the first national probability sample of transgender people in the United States, meaning it will provide the most accurate representation of transgender people's experiences. This survey measures numerous indicators of interest, including basic demographics, health care access, experiences of discrimination, and mental and physical health. The study sampled the US population above age 18 (total n=1436), with the specific goal of obtaining a representative sample of transgender respondents (n=274), plus a cisgender comparison sample (n=1162). The restricted dataset allows me to access the respondents' zip codes, thus linking their health outcomes to local attitudes and policies and testing how the minority stress hypothesis varies across the country. To do this, I utilize policy data from the Movement Advancement Project to measure structural stigma (Movement Advancement Project 2017). The Movement Advancement Project is a nonprofit research organization focused on LGBTQ+ policies in the United States.

I find that, in general, transgender respondents fare worse on mental and physical health outcomes compared to their cisgender peers without taking into account structural stigma. In addition, I find that structural stigma has a significant association with poorer mental health outcomes for transgender individuals only. These results paint a disheartening picture of transgender mental health inequity, where the average baseline mental health of gender minorities is worse than cisgender individuals and anti-transgender laws exacerbate the

psychological distress. These results offer a critically important public health lens on the current national debate over transgender rights.

3. Chapter IV. Sources of Strength: Assessing the Social Determinants of Resilience among Transgender Adults

The third empirical chapter focuses on the social determinants of transgender resilience. As discussed above, gender minorities experience major health disparities in the United States (Hsieh and Shuster 2021; Scheim et al. 2022). But researchers have also called for more attention to the strengths of LGBTQ+ people, such as resilience to overcome stress and stigma (Colpitts and Gahagan 2016). This shift in focus is supported by the inclusion of resilience in the minority stress framework (Meyer 2015). Meyer (2015) outlines two types of resilience: community and individual resilience. Community resilience refers to group-level factors that provide external resources for coping with stress and stigma, such as having a community of transgender peers, whereas individual resilience refers to internal resources such as gender identity pride or self-acceptance (Matsuno and Israel 2018). Scholars have linked several resilience factors to improved outcomes and the moderation of stressors (Barr et al. 2016; Bockting et al. 2013; Budge et al. 2013; Testa et al. 2015).

Thus far research on psychological resilience in the minority stress model has focused primarily on understanding whether and how resilience factors affect mental health outcomes. That is, the focus is on resilience as predictor of mental health, or as mediator between stress/stigma and mental health. However, little research has examined resilience as an outcome itself to understand its social determinants. This empirical chapter explores the social determinants of transgender community connectedness (TCC) and gender identity pride, a community- and individual-level resilience factor. This approach builds on the NIH

SGM health disparities framework by focusing on positive factors such as chosen families, access to community, and self-acceptance.

I again use the 2016-2018 TransPop survey, this time restricting the sample to transgender adults. Using this national probability sample allows me to estimate averages of these resilience factors for the national adult transgender population and examine the social determinants of these resilience factors. These are valuable contributions to our understanding of transgender resilience as they will provide insight to how common resilience is among transgender adults and what factors are related to higher or lower resilience. This can help point to vulnerable subpopulations or ways to intervene. In trying to understand the social determinants of resilience, I examine adulthood sociodemographic factors, childhood experiences, and geographic variables that I hypothesize to be related to TCC and pride.

There are three key findings: 1) variation in gender identity and socioeconomic status within the transgender community is linked with differences in resilience; 2) therapy is strongly linked to both higher TCC and pride; and 3) childhood bullying is linked to lower gender identity pride as an adult. Building on the work of others who call on researchers to expand their focus from only disparities and negative outcomes (e.g., Colpitts and Gahagan 2016), I argue that TCC and pride are not only valuable as resilience factors, but as measures of transgender wellbeing, or what may be called “trans joy” or “gender euphoria” (Beischel, Gauvin, and van Anders 2022; shuster and Westbrook 2022).

4. Chapter V: Conclusion

In the final chapter, I open with a summary of the state of LGBTQ+ people in the United States today. I provide a brief overview of my findings from the three empirical

chapters of the dissertation. I then discuss the overarching themes of this dissertation: geography and social context, stigma, and health disparities and equity. This includes aspects not directly investigated in this research but relevant to understanding the broader context of sexual and gender minority health. I conclude with final thoughts on directions for future research that build on the findings and evidence from the empirical chapters.

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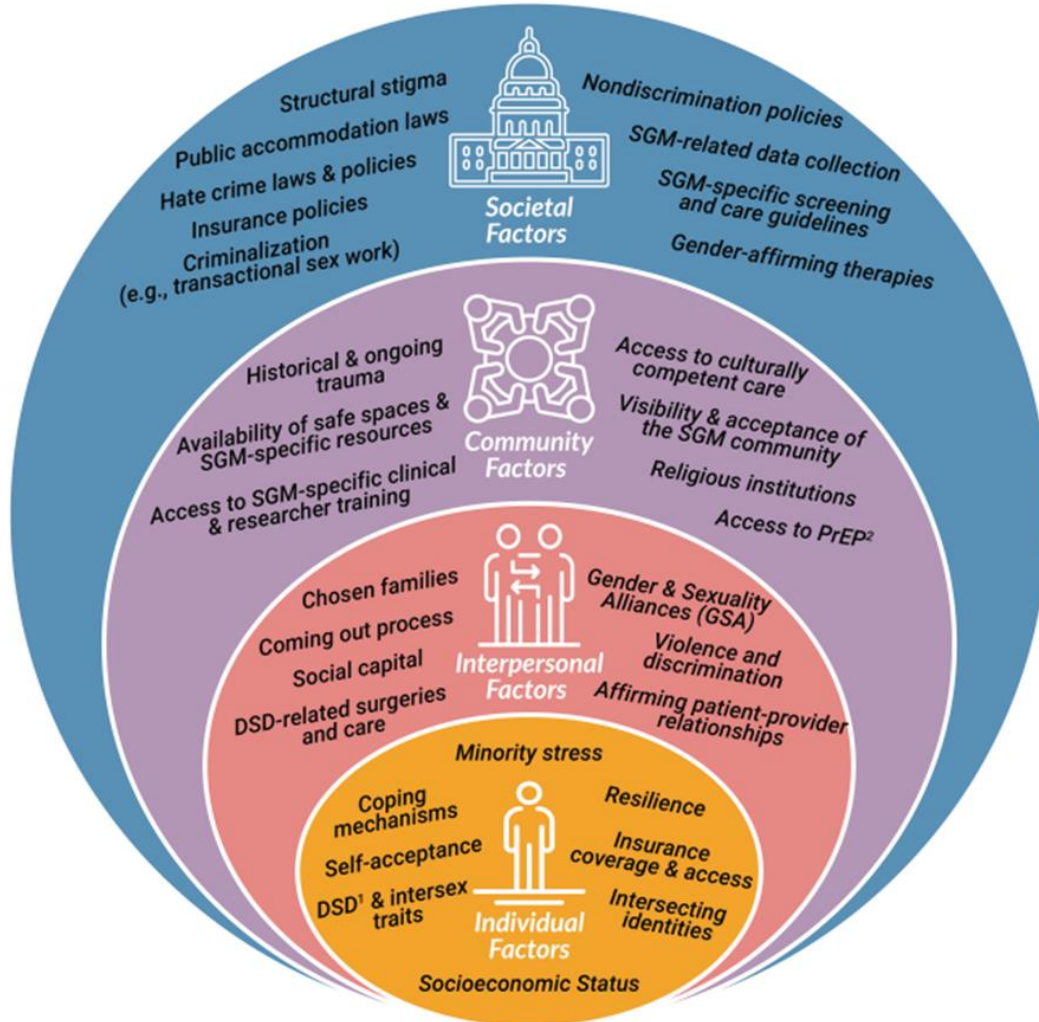
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Chapter I Appendix A: National Institutes of Health Sexual and Gender

Minority Health Disparities Framework



II. Medicaid Expansion and HIV/AIDS: Increased Enrollment, Persistent Disparities

A. Abstract

The first empirical chapter of this dissertation focuses on HIV/AIDS and health insurance. I focus on how the differential state-level implementation of the Affordable Care Act's Medicaid expansion impacts viral suppression and HIV diagnoses outcomes among White, Black and Latinx individuals and gay, bisexual, and other cisgender men who have sex with men (GBMSM). Health care provides access to important services such as pre-exposure prophylaxis (PrEP), anti-retroviral therapy (ART), HIV testing, and access to a primary care provider. I employ data from the Centers for Disease Control and Prevention on viral suppression and HIV diagnoses. I find a reduction in HIV diagnoses among Latinx individuals in the Medicaid expansion states, but no effect on White or Black individuals or GBMSM. Despite this reduction, substantial health disparities remain in the post-expansion period, as White Americans continue to have the highest viral suppression and lowest diagnosis rate compared to Black and Latinx Americans. Persistent health disparities even with an expansion of health care access leads me to suggest that racism and stigma are operating as fundamental causes of HIV disparities (Hatzenbuehler et al. 2013; Phelan and Link 2015). Interventions that explicitly target racism and stigma are likely necessary to achieve health equity in HIV/AIDS outcomes in the United States.

B. Introduction

HIV/AIDS affects the lives of over one million Americans, with a disproportionate impact on Black and Latinx transgender women and gay, bisexual, and other cisgender men

who have sex with men (GBMSM, representing people whose gender identity aligns with their assigned sex at birth). In 2021, 36,136 people were newly diagnosed with HIV (HIV.gov 2023). GBMSM represented 71% of these new diagnoses, while Black GBMSM represented 25% and Latinx GBMSM represented 23% of new diagnoses (HIV.gov 2023). Transgender women represented an additional 2% of new HIV diagnoses in 2021 (HIV.gov 2023), approximately 45% of whom are Black and 31% are Latinx. These disproportionate statistics represent health disparities and measure the current state of HIV health equity in the US (Braveman 2014).

The National Institutes of Health (NIH) outlined a sexual and gender minority (SGM) research framework that includes health insurance policies, coverage, and access as a mechanism of health inequality (NIH SGM Research Office 2021). This is because health care is simultaneously vital for combating diseases that disproportionately impact segments of the SGM population, such as HIV/AIDS, and hard to access for anyone without health insurance. Health care provides access to important HIV services such as access to a primary care provider, pre-exposure prophylaxis (PrEP), HIV testing, viral load testing, and anti-retroviral therapy (ART). Collectively, these health services can inhibit the transmission of HIV by preventing, identifying, and managing infections.

Medicaid, the federal program that provides health care to low-income adults, plays an outsize role in combating the HIV/AIDS epidemic. According to the Kaiser Family Foundation,¹ Medicaid covers 40% of the population living with HIV and is the largest source of insurance coverage for people living with HIV in the US (Dawson et al. 2023).

¹ The Kaiser Family Foundation is a non-profit health research organization that is unaffiliated with the health care provider Kaiser Permanente.

Given that health care access is important in combating HIV/AIDS and that Medicaid is the largest source of HIV/AIDS care, we might expect increased coverage to correspond with improved HIV/AIDS outcomes. The number of people with HIV who are enrolled in Medicaid has increased over time, both as an overall trend and also as a result of the expansion of Medicaid via the Affordable Care Act (Dawson et al. 2023).

The Affordable Care Act (ACA) required states to expand their Medicaid programs to all adults with incomes up to 138% of the federal poverty line (FPL), but in a Supreme Court decision (*National Federation of Independent Business v. Sebelius*), the requirement was struck down and implementation of Medicaid expansion was made optional for states. On January 1, 2014, half the states in the U.S. implemented Medicaid expansion under the ACA. Since then, numerous additional states have adopted Medicaid expansion, bringing the total number of states that have adopted ACA Medicaid expansion to 41 (including D.C.). Ten states have yet to adopt the expansion (Kaiser Family Foundation 2023). The uneven implementation of Medicaid expansion between states provides a unique opportunity to compare the impacts of Medicaid expansion on HIV/AIDS in states that adopted the reform with states that did not.

In this research, I explore how the expansion of Medicaid through the ACA impacts viral suppression and HIV diagnoses of different populations. I first run analyses that show Medicaid expansion led to increases in the percent of people enrolled in Medicaid, corroborating prior research and demonstrating that health care coverage did indeed increase. This creates a plausible context for Medicaid expansion to impact 1) viral

suppression and 2) HIV diagnoses and to explore how these impacts vary by race and sexuality.²

I employ the best available surveillance data from the Centers for Disease Control and Prevention and link these outcomes with states that did and did not expand Medicaid. I utilize the causal inference technique difference-in-differences to ascertain whether Medicaid expansion impacted viral suppression and HIV diagnoses, in tandem with descriptive results to provide additional context. Results paint a complex picture of HIV health equity in the post-expansion period. Despite descriptive trends showing increases in viral suppression and declines in HIV diagnoses in the post-expansion period, I do not find any evidence that this is because of Medicaid expansion. I then examine whether there were improvements in HIV diagnoses among important subpopulations: White, Black, and Latinx individuals, and GBMSM. Here, I find a reduction in HIV diagnoses among Latinx Americans in the Medicaid expansion states. However, results are null for the other subpopulations. Despite limitations in population data for sexual and racial minorities, descriptive results suggest improved health equity for Latinx HIV diagnoses, but do not demonstrate improved health equity in viral suppression or HIV diagnoses for Black individuals or GBMSM. White (GBMSM) individuals continue to enjoy the highest viral suppression and lowest HIV diagnosis rate.

The results of this research generate several implications for social scientists studying health, particularly HIV. While health insurance is certainly one mechanism of SGM health inequality, these results suggest that even improvements in health insurance coverage for

² I use sexuality here to indicate sexual behavior, such as men who have sex with men, and sexual identity, such as gay and bisexual men.

low-income Americans are not sufficient to eliminate health disparities in HIV outcomes, particularly for Black GBMSM. I propose that racism and stigma are likely operating as fundamental causes of HIV inequalities (Hatzenbuehler, Phelan, and Link 2013; Phelan and Link 2015). A fundamental cause of health inequality exists when health disparities persist despite changes in “diseases, risk factors, and health interventions” (Hatzenbuehler et al. 2013; Phelan and Link 2015). In this case, improvements in health insurance coverage, which in theory provides better access to important HIV services, may not be as effective for stigmatized infections such as HIV or marginalized populations such as racial and sexual minorities. Interventions and programs that target these fundamental causes and that learn from stigmatized communities are critical to achieving health equity in HIV/AIDS outcomes. In the next section I review prior research on Medicaid expansion and HIV/AIDS.

C. Background

There are two pathways through which the ACA Medicaid expansion could have an effect on HIV/AIDS rates. One is through an increase in enrollment in Medicaid, in which more people living with HIV (PLWH) and people at risk for HIV who were not previously enrolled are now receiving HIV-related preventive care or treatment. The other way is through an improvement or expansion of services with the existing Medicaid enrollees. For example, offering PrEP as a new benefit. Both pathways could be operating at the same time. However, this study and most others focus on the increase in enrollment as the primary pathway to improving health outcomes. This is because prior to the ACA, low-income PLWH often fell into an insurance coverage gap since Medicaid eligibility included having children or a disability in addition to income requirements. The ACA Medicaid expansion eliminated this in favor of a more inclusive policy for anyone under 138% of the federal

poverty line (FPL), regardless of children or disability. Thus, in states that opted into this Medicaid expansion, there should be an increase in the number of people enrolled in Medicaid. Did Medicaid expansion increase the number of people at risk of HIV and PLWH who had access to health insurance?

Research suggests the answer is yes. Three states that expanded Medicaid saw an increase in the number of PLWH who were insured by Medicaid (Berry et al. 2016). Similarly, the likelihood of having insurance was greater after the implementation of Medicaid expansion in Chicago and Washington State (Hood et al. 2017). In Rhode Island, about 15% of PLWH who had previously been uninsured or underinsured were now fully insured through ACA Medicaid expansion (McQuade et al. 2015).

These studies demonstrate that Medicaid expansion led to increases in insurance coverage for PLWH. Did this increased coverage lead to increased health service use or improved health outcomes? Evidence from other studies also suggests the answer is yes. Medicaid expansion increased usage of regular and preventative care among the general patient population, including HIV testing, in states that implemented the expansion (Simon, Soni, and Cawley 2017; Sommers et al. 2017). A randomized, controlled study of a Medicaid lottery in Oregon prior to the ACA also found increased usage of health services (Baicker et al. 2013). Increased HIV testing could link more undiagnosed PLWH to HIV care, which initially could increase HIV diagnoses but over time may reduce them as more PLWH are virally suppressed. A quasi-experimental study found Medicaid expansion increased HIV diagnoses (Farkhad, Holtgrave, and Albarracín 2021), while a descriptive study in Massachusetts found a 50% reduction in diagnoses in the 15 years after they expanded Medicaid in 2001 (Cranston et al. 2017). This reduction in diagnoses over time

may be a result of PrEP usage and improved viral suppression. Medicaid expansion appears to have improved PrEP usage and even viral suppression (Erugo 2017; Farkhad et al. 2021; Furl et al. 2018; Karletsos and Stoecker 2021; Satre et al. 2016).

Others have discussed these studies and more in a review (Adamson, Lipira, and Katz 2019). They concluded that while there is descriptive evidence that the Affordable Care Act and Medicaid have improved certain HIV/AIDS outcomes, more causal oriented research is needed. Two recent studies have added to this causal approach demonstrating improvements in PrEP usage and HIV diagnoses (Farkhad et al. 2021; Karletsos and Stoecker 2021), but more research is needed. For example, viral suppression is a key measure of HIV prevention, but the effect of Medicaid on this outcome has not yet been assessed using quasi-experimental methods. The research presented here is intended to continue building robust evidence for Medicaid's impact on HIV/AIDS outcomes. Using a difference-in-differences approach, I will measure the effect of Medicaid expansion on viral suppression and HIV diagnoses. I revisit HIV diagnoses as an outcome of interest because 1) there is conflicting evidence as to whether Medicaid expansion increases or decreases diagnoses (described above) and 2) the data allow me to examine outcomes by race and for GBMSM. These data allow me to add to the health policy literature by addressing health equity in outcomes post-Medicaid expansion. Even so, there are some limitations with these data, which I discuss in the next section.

D. Data and Methods

1. Dependent Variables

I utilize data from the Kaiser Family Foundation (KFF) on the percent of people enrolled in Medicaid (Kaiser Family Foundation n.d.). These are state-level data from 2011-2019, measured as state-years. I begin my analyses with this outcome variable in order to establish that Medicaid expansion does in fact have an impact on health care coverage, as this makes its effect on the other outcomes more plausible.

I then employ the percent of HIV positive individuals who achieved viral suppression from 2012-2019 and the rate of people who received an HIV diagnosis per 100,000 residents, from 2008-2019 (Centers for Disease Control and Prevention 2021). I limit my analyses to data collected prior to the 2020 COVID-19 pandemic, as the CDC cautions against relying on those data for accuracy. These annual rates allow the results to be scaled and comparable across states with different populations. All data are based on people aged 13 years or older. Viral suppression is measured by someone diagnosed with HIV who received a CD4 or viral load test and received results that indicated their viral load was <200 copies/mL. HIV diagnoses are based on laboratory or clinical confirmations of HIV infection in that year.³

I also examine these outcomes by race and “transmission category,” a public health term that includes gay, bisexual, and other cisgender men who have sex with men as one mode of transmission. Specifically, I descriptively examine viral suppression by White, Black, and

³ Information summarized from the CDC’s Atlas Plus “Technical Footnotes” on HIV, section 1.6 on HIV indicators. <https://www.cdc.gov/nchhstp/atlas/index.htm>. Last retrieved Feb 17, 2022.

Latinx GBMSM from 2017-2021, as these are the only years for which this is available and precludes difference-in-differences analysis. I also examine HIV diagnoses by White, Black, and Latinx populations and GBMSM populations, data which are available 2008-2019. For these populations, I do perform difference-in-differences analyses. Note that for viral suppression, the data allow me to examine the intersection of GBMSM and race, while for HIV diagnoses I can only examine these groups separately.

This is because viral suppression is measured as a percent of people diagnosed with HIV, a group for which race and transmission category are known. On the other hand, HIV diagnoses are measured as a rate per 100,000 of the general population. While the CDC provides rates per 100,000 for race, as these populations are reliably measured, they do not for GBMSM as their population total is not definitely measured. In order to examine diagnosis rates for GBMSM, I rely on prior research that has estimated the GBMSM population by state (Grey et al. 2016), and I use this to construct rates per 100,000 for this population. The estimates are constructed using 2009-2013 data, and I assume the GBMSM population is relatively stable through the end of my observation period (2019). This is a limitation, but unavoidable in the absence of reliable population data.

Furthermore, missing data is a problem for viral suppression as not all state-years met the laboratory criteria for reporting. In order to resolve this issue, I restrict the analyses on this outcome variable to only the states with 8 years of data (from 2012-2019), a specification which preserves a balance of treatment and control states while substantively improving internal validity. On the other hand, HIV diagnoses has data for all 50 states from 2008-2019. I further discuss how many states are in the sample in the next subsection.

2. Independent Variables

I use information compiled by the Kaiser Family Foundation to determine which states expanded Medicaid in what year (see Appendix A for details). In my main models I consider treatment states to be those that expanded Medicaid on January 1, 2014. I exclude the seven states that expanded Medicaid in the following two years in order to create a cleaner difference-in-differences model (Michigan, New Hampshire, Pennsylvania, Indiana, Alaska, Montana, and Louisiana), while the other late expanders I include as control states since they expand in 2019 or later. I also follow prior research and exclude the District of Columbia (it is an outlier that skews results if treated as a state) and four states that expanded Medicaid before 2014 (Delaware, Massachusetts, New York, and Vermont; e.g., Courtemanche et al. 2017; Simes and Jahn 2022). This leaves 39 states for analysis in HIV diagnoses (see Table 1a). For viral suppression, since I only include states with adequate pre- and post-treatment data, the sample is 20 states (see Table 1b). I also run supplementary analyses where I relax these specifications, using all 50 states for HIV diagnoses and 26 states for viral suppression (see Supplementary Information).

The models include several controls (see Table 2 for descriptive statistics). I use state-level data from the CDC (which they compiled from the American Community Survey) on the percent of the population over 25 years old that does not have a high school degree. This indicates the educational and socioeconomic level of the state, which is linked to HIV (Anon 2010; Denning and DiNenno 2010). I also include CDC information on the percent of households living below the federal poverty line as another indicator of socioeconomic levels in a state. I include the uninsurance rate as a control in the HIV/AIDS outcome models. Decreases in this rate may be correlated with the outcome variables in a way that is

not related to Medicaid expansion, for example increased enrollment in Qualified Health Plans through the health care marketplace installed after the Affordable Care Act (also known as “Obamacare”). While there are certainly other variables that impact HIV/AIDS outcomes, the fixed-effects for treatment and control states should eliminate any relatively stable over-time state-level variables, such as population density, LGBT density, racial minority populations, rural population, religious context, and political traditions.

3. Analytic Strategy

I develop a difference-in-differences (DID) model for each outcome variable. This is a quasi-experimental method that uses observational data to make causal inferences. The parallel trends assumption is the identification strategy for the DID approach that attempts to recover a causal estimate even in the absence of the missing potential outcome (see Appendix B for more information on the potential outcomes framework). The DID estimator is the interaction between the post-treatment period and the treatment states. A parallel trends plot should demonstrate that the pre-treatment trends are largely similar (i.e., parallel) between the treated and control groups. Since there is no statistical test for parallel trends, visual inspection is considered sufficient (Anon 2016). If the parallel trends assumption is met, I will conduct two DID analyses. First will be a simple DID with covariates, as specified by the following equation:

$$(1) \ Y_{jt} = \beta_0 + \beta(\text{Post Treatment}) \times \beta(\text{Treatment}) + \beta_{jt}(\text{Poverty}) + \beta_{jt}(\text{No High School Degree}) + \beta_{jt}(\text{Uninsurance Rate}) + e$$

Where Y is the outcome variable for each state-year, β_0 is the intercept, and then the interaction between the post-treatment period and the treatment group. The time-varying

covariates include the percent in poverty, the percent without a high school degree, and the percent without insurance, plus an error term. Standard errors are clustered by state.

The second DID model adds year and state fixed effects. Year fixed effects control for any general trends over time that affect all states, while state fixed effects control for stable characteristics of states that may contribute to different pre-existing levels of HIV rates, such as urbanicity.

$$(2) Y_{jt} = \beta_0 + \beta(\text{State}) + \beta(\text{Year}) + \beta(\text{Post Treatment}) \times \beta(\text{Treatment}) + \beta_{jt}(\text{Poverty}) + \beta_{jt}(\text{No High School Degree}) + \beta_{jt}(\text{Uninsurance Rate}) + e$$

E. Results

1. Parallel Trends Plots

As mentioned before, the parallel trends assumption is key to causal inference in DID (see Figure 1). Parallel trends are assessed using visual inspection of plots (Anon 2016). In Panel A we can see the percent enrolled in Medicaid for the 20 states used in the viral suppression analyses. Pre-treatment trends (i.e., before 2014) appear to be roughly similar between treated and control states, with a slightly higher rate of increase among the treated states. Treated and control states begin in 2012 with largely similar Medicaid enrollment numbers, between 16-17%. Panel A clearly shows a spike in the treated states after 2014 that is not mirrored in the control states. While the control states remain between 16-17% through the post-treatment period and even decline below 16% by 2018 and 2019, treated states see their enrollment figures jump to 19% in 2014 and hover between 20-21% for most of the post-treatment period.

Panel B shows the percent who are virally suppressed. Pre-treatment trends are parallel in 2012 and 2013. Treatment states have a higher percent of PLWH who are virally suppressed in both the pre- and post-treatment periods. Both treatment and control states saw improvements in this outcome, from a low of 50-53% in 2012 to a high of 67-71% in 2019. Viral suppression is a key tool in preventing the transmission of HIV (i.e., undetectable=untransmittable), and so improvements in this outcome may lead to less community transmission and thus fewer HIV diagnoses.

In Panel C we can see the percent enrolled in Medicaid for the 39 states used in the HIV diagnoses analyses. Pre-treatment trends are largely parallel between treated and control states, meeting the parallel trends assumption. Treated and control states begin in 2011 with similar Medicaid enrollment numbers, around 16-17%. As in Panel A, there is a clear spike in the treated states after 2014 that is not mirrored in the control states.

Now I look at the parallel trends for HIV diagnoses per 100,000 people (Panel D). Trends in the diagnosis rate are parallel in the pre- and post-treatment periods, with marked declines over time. Treated states have fewer diagnoses overall, but both sets of states have fewer HIV diagnoses in 2019 than in 2008.

Panel E shows trends in HIV diagnoses stratified by race in treatment and control states. The solid lines show rates for Black Americans, the short dash shows rates for Latinx/o/a Americans, and the long dash for White Americans. With respect to the parallel trends assumption, the pre-treatment trends for all three racial groups are largely parallel, allowing for a difference-in-differences analysis. Unfortunately, it is clear from this figure that racial disparities in HIV diagnoses are large and remain years into the post-treatment period. On average, White Americans have an HIV diagnosis rate of 5 diagnoses per 100,000 in the

post-treatment period, while Latinx Americans have a rate of 17.5 diagnoses per 100,000 and Black Americans have a rate of 43.2 diagnoses per 100,000.

In Panel F, I plot HIV diagnoses for GBMSM for the treatment and control states. Note that the scale of diagnoses in this population is disproportionately higher—the lowest rate is 415 diagnoses per 100,000 in 2019 in the treated states, while the highest is almost 650 diagnoses per 100,000 in 2015 in the control states. Of course, the denominator is an estimation (i.e., the population of GBMSM in each state), so these are also only estimates of the rate of diagnoses among GBMSM. In broad strokes, however, it is clear the rate of diagnoses is vastly higher among GBMSM compared to the general population. With respect to the parallel trends assumption, the pre-treatment trends are largely parallel, allowing for a difference-in-differences analysis. The treated states have lower diagnosis rates overall for GBMSM compared to the control states, and in the post-treatment period it appears the diagnosis rate may begin to decline among the treated but not among the control states. DID analysis will determine whether this is due to Medicaid expansion. I now turn to those results.

2. Difference-in-Differences Analysis

I start my difference-in-differences analysis by focusing on the percent enrolled in Medicaid and the percent of PLWH who are virally suppressed (see Table 3). I begin first with Medicaid enrollment in order to demonstrate that expansion did in fact lead to greater enrollment in the states studied in this sample ($N=20$). If it does, then it is plausible that increased health care coverage could improve viral suppression through access to anti-retroviral therapy and CD4/viral load tests. I find that Medicaid expansion led to a 1.4-2 percentage point increase the number of people enrolled in Medicaid (Model 1, $\beta=2.05$,

$p < 0.05$; Model 2, $\beta = 1.43$, $p < 0.01$). However, when I examine results for viral suppression (Models 3 and 4), I find no effect of Medicaid expansion on this outcome. Furthermore, using the limited data available, disparities remain between racial groups among the population of GBMSM (see Figure 2). Looking at this descriptive figure showing viral suppression from 2017-2021 (the years data for race and GBMSM are available), it is apparent that health equity has not been achieved for Black and Latinx GBMSM, as they continue to have a lower percent of viral suppression compared to White GBMSM.

Now I analyze the results for Medicaid enrollment and HIV diagnoses. These results are presented in Table 4. Results from the difference-in-differences models demonstrate that the expansion of Medicaid in 2014 increased the percent of people enrolled in Medicaid among this sample of states as well ($N=39$). The DID estimator in Models 1 and 2 suggests that Medicaid expansion increased the percent enrolled in Medicaid by 2-2.5 percentage points (Model 1, $\beta = 2.53$, $p < 0.001$; Model 2, $\beta = 2.11$, $p < 0.001$). Covariates in Models 1 and 2 reflect similar results but differ in size. Model 2 is the more conservative result since it includes state and year fixed effects, which increase the R-squared to 0.98. The results here suggest that a higher percent in poverty is associated with a higher percent enrolled in Medicaid (Model 2, $\beta = 0.71$, $p < 0.001$). Specifically, for every percentage point increase in poverty there is a corresponding 0.7 percentage point increase in enrollment in Medicaid. Given Medicaid's low-income eligibility criteria, this is expected. Lower percentages of people without health insurance are associated with higher percentages enrolled in Medicaid (Model 2, $\beta = -0.86$, $p < 0.001$).

Because enrollment increased in these states, it is plausible that there may be effects on HIV diagnoses. However, the difference-in-differences estimator for diagnoses is non-

significant in both models, and essentially non-existent in the fixed-effects model (Model 4, $\beta=0.01$, $p>0.1$). The covariates in Model 3 suggest that increased poverty is associated with fewer HIV diagnoses, while a larger percent of people without a high school degree is associated with more HIV diagnoses. However, these results are not replicated in Model 4, which is the more conservative model. These results suggest that Medicaid expansion may not have an impact on HIV diagnoses, at least in the 5 years since treatment began. Yet it is clear from the parallel trends plot that HIV diagnoses are declining over time, so this phenomenon remains unexplained.

It is possible that Medicaid expansion may have effects on certain populations that are particularly affected by HIV, such as Black and Latinx individuals and GBMSM. Table 5 presents results for DID estimation of HIV diagnoses within White, Black, Latinx, and GBMSM populations. I find no effect of Medicaid expansion on HIV diagnoses among White or Black Americans or GBMSM. However, I do find a relationship suggesting Medicaid expansion reduced HIV diagnoses among Latinx Americans (Model 6, $\beta=-2.73$, $p=0.057$). The model suggests that Medicaid expansion resulted in 2.7 fewer HIV diagnoses per 100,000 in the treated states post-expansion. In separate analyses (not shown), I individually exclude each state that had at least 100 cases of Latinx HIV diagnoses during the observation period in order to assess whether the results are driven by states with larger Latinx populations (N=14 states). While the exclusion of some states (e.g., Florida, Connecticut) produce DID estimators with p-values over 0.1, without exception the point estimate is -2.7 ± 0.4 , suggesting a robust finding not driven by any outliers.

In order to better understand the landscape of health disparities between White, Black, and Latinx populations, I plot White-Black and White-Latinx disparities in HIV diagnoses

by treated and control states over time (see Figure 3, Panels A and B). In Panel A, average White-Black disparities are higher in non-expansion states in the pre-2014 period. However, after 2016, the White-Black disparity in HIV diagnoses in the non-expansion states actually drops below the average White-Black disparity in the expansion states, suggesting that Medicaid expansion has no influence on this phenomenon. On the other hand, in Panel B, average White-Latinx disparities are higher in the Medicaid expansion states prior to 2014. After Medicaid expansion in 2014, the treated states see a reduction in the average White-Latinx disparity. While these two figures are purely descriptive, they add context to the findings in Table 5 that demonstrate a reduction in HIV diagnoses for Latinx individuals but not for White or Black individuals or GBMSM. Collectively, these results suggest that Medicaid expansion potentially improved health equity for Latinx individuals, but not for Black individuals. I discuss these results in the next section.

F. Discussion

The results of this research illustrate that the state of HIV in the post-Medicaid expansion era is complex, and they contribute to our understanding of the interplay between health insurance policies and HIV outcomes. The analytic strategy used here builds on past research by utilizing a causal inference design in determining the effect of Medicaid expansion on viral suppression and HIV diagnoses. First, these results corroborate previous research that found Medicaid expansion led to increased Medicaid coverage (Berry et al. 2016; Hood et al. 2017; McQuade et al. 2015). This is an important finding and a necessary first step for demonstrating that Medicaid expansion does indeed lead to improvements in health insurance coverage. This makes it more plausible that Medicaid expansion could lead to better HIV outcomes, since more people would be receiving care through Medicaid.

Descriptive results demonstrate improvements in viral suppression over the observation period. White and Latinx GBMSM in treated states appear to have better viral suppression compared to their peers in control states, however Black GBMSM have largely similar viral suppression rates in both sets of states (Figure 2). Despite this, I find no effect of Medicaid expansion on viral suppression, and racial disparities within the GBMSM population remain years after expansion. White GBMSM have better viral suppression rates than Latinx and Black GBMSM, a result which replicates evidence found elsewhere (e.g., Sullivan et al. 2021). Given this, it is no surprise that Latinx and Black GBMSM continue to represent a disproportionate share of new HIV diagnoses. With lower rates of viral suppression, community transmission of HIV is likely higher. Even so, the viral suppression rate for Latinx and Black GBMSM in 2017 is higher than it was in 2012 for the general population. (Unfortunately, a direct comparison is not possible as race and GBMSM data for viral suppression is not recorded by the CDC prior to 2017).

Increased viral suppression should theoretically lead to fewer HIV diagnoses over time. Indeed, HIV diagnoses are declining over time. However, these results do not show any evidence for improvements in HIV diagnoses due to Medicaid expansion, with the exception of Latinx Americans. Descriptive trends also suggest that health equity in HIV diagnoses improved for Latinx individuals, but not Black individuals (as measured by White-Latinx and White-Black disparities). It is possible there was a larger pool of Latinx individuals who benefited from the expansion compared to other groups, and that health coverage was the main barrier to accessing HIV care. However researchers would need to corroborate this speculation. With respect to the other populations, HIV diagnoses may require a longer window in order to see an effect from Medicaid expansion. For example,

Cranston et al. (2017) find an improvement in HIV diagnoses almost 15 years after Massachusetts expanded their Medicaid program, although these are descriptive results.

Alternatively, broad-based improvements in health insurance coverage may not be enough to fight HIV, particularly for stigmatized groups like Black GBMSM. Fundamental cause theory offers one perspective on the results of this study. It suggests that stigma and racism affect the mechanisms that influence health, and that these persist despite changes in treatment and health risks (Hatzenbuehler et al. 2013; Phelan and Link 2015). Health policies and HIV interventions “must address the social factor itself” as opposed to simply expanding access to health services (Hatzenbuehler et al. 2013:813). Research has found that the benefits in health outcomes post-Medicaid expansion have mainly accrued to White Americans and not Black or Latinx Americans (Lee and Porell 2020; Snowden et al. 2022), although here I find improvements for Latinx HIV diagnoses. Because HIV and those who are at risk for it are stigmatized, even improvements in health insurance may not be enough to improve all outcomes. Socioeconomic status and race have been documented as fundamental causes of HIV/AIDS mortality (Rubin, Colen, and Link 2010). I extend this theoretical framework to viral suppression and HIV diagnoses.

Stigma around HIV and sexuality can influence whether, where, and how often gay, bisexual, queer and other men who have sex with men (GBQMSM) get tested for HIV, particularly for Black GBQMSM (Iott et al. 2022, acronym reflects their usage). Healthcare provider stigma can be a major barrier for HIV care (Geter, Herron, and Sutton 2018; Stringer et al. 2016). More targeted interventions may be more effective if they work within stigmatized communities, although even these kinds of targeted interventions have flaws (Keene et al. 2021). Above all, studies that seek to learn from stigmatized groups, such as

young Black GBMSM, likely offer the best path to health equity (Dangerfield et al. 2021; Holloway et al. 2017; Mutchler et al. 2015). This has important implications for health policy and HIV/AIDS interventions, as policies that do not take into account race, sexuality, and stigma may not achieve HIV equity.

1. Limitations

This Chapter has strengths and weaknesses. While the causal research design is an improvement on descriptive results, it remains a quasi-experimental method that relies on observational data and the validity of the parallel trends assumption. There are also several limitations associated with the study population. One is that the CDC data are not restricted to low-income adults. This makes the results conservative since the outcome variables are not specific to the Medicaid population. Even so, HIV infection is correlated with low socioeconomic status (Anon 2010; Denning and DiNenno 2010) and 40% of PLWH receive health care through Medicaid (Dawson et al. 2023). Future research may build on these findings by utilizing HIV data that are specific to the Medicaid population.

Both outcome variables have limitations when measuring the effect of Medicaid expansion. Viral suppression is theoretically the measure with the fewest limitations since it would likely be directly tied to increased health care access and continued management of HIV through a primary care provider, regular testing, and ART. However, as previously discussed, there are missing data that inhibit the ability to infer results to the entire US. HIV diagnoses have much better data, including by race and for GBMSM for the full observation period. But there are some inferential problems with using diagnoses as a measure. Diagnoses could initially increase because of increased testing due to Medicaid expansion, which is in fact what another difference-in-differences analysis found (Farkhad et al. 2021).

They also acknowledge, however, that HIV diagnoses may decline over a longer window of observation as HIV incidence declines. It is possible that countervailing findings in this outcome may result in a null finding. In other words, an initial increase followed by a subsequent decline in diagnoses could “cancel” each other out.

Another major limitation of this research is that data available through the CDC did not adequately measure racial, sexual, or gender minority identity in a way that was consistently useful in these analyses. I employed these data where possible in order to further our understanding of the state of HIV equity. For example, viral suppression data for race within the GBMSM population was available, but only for 2017-2021; while HIV diagnoses data for race and GBMSM populations were available separately, but over the full observation period. Additionally, I had to estimate the rate of GBMSM diagnoses because the exact population is not precisely known. Furthermore, the lack of data representing transgender individuals prior to 2017 and at the state level significantly impedes research on this vulnerable population. State and federal research bureaus should consistently collect sexual orientation and gender identity (SOGI) information in order to improve our understanding of health equity in these communities.

G. Conclusion

Achieving HIV health equity in the United States is complex and difficult. Limitations in SOGI data collection alongside HIV data make it even harder to determine how to best intervene to improve disparities for sexual and gender minorities who are impacted by HIV/AIDS. Using the best available population surveillance data from the CDC, I find a small reduction in HIV diagnoses for Latinx individuals in the Medicaid expansion states. However, I do not find improvements in viral suppression or HIV diagnoses for White or

Black individuals or GBMSM due to the Affordable Care Act's Medicaid expansion. The reduction in HIV diagnoses for Latinx Americans is a positive sign, but it does not bely the fact that White Americans continue to enjoy higher viral suppression and lower HIV diagnoses.

While the NIH SGM research framework identifies health insurance policies, coverage, and access as mechanisms of SGM health disparities, these results suggest a more complicated assessment. Expanding health coverage alone may not be enough to address disparities in HIV/AIDS, despite increased access to HIV health care services. HIV is a highly stigmatized infection that disproportionately affects a stigmatized population: Black and Latinx sexual minority men and transgender women. Interventions and programs that learn from these communities and tackle stigma alongside providing HIV services are critical to achieving health equity in HIV/AIDS outcomes (Dangerfield et al. 2021; Holloway et al. 2017; Iott et al. 2022; Mutchler et al. 2015).

Chapter II References

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Table 1a: Treatment and control states for HIV diagnoses (N=39)

Control (19)	Treatment (20)
Alabama	Arizona
Florida	Arkansas
Georgia	California
Idaho	Colorado
Kansas	Connecticut
Maine	Hawaii
Mississippi	Illinois
Missouri	Iowa
Nebraska	Kentucky
North Carolina	Maryland
Oklahoma	Minnesota
South Carolina	Nevada
South Dakota	New Jersey
Tennessee	New Mexico
Texas	North Dakota
Utah	Ohio
Virginia	Oregon
Wisconsin	Rhode Island
Wyoming	Washington
	West Virginia

Table 1b: Treatment and control states for viral suppression (N=20)

Control (11)	Treatment (9)
Alabama	California
Maine	Hawaii
Missouri	Illinois
Nebraska	Iowa
South Carolina	Maryland
South Dakota	North Dakota
Tennessee	Oregon
Texas	Washington
Utah	West Virginia
Virginia	
Wisconsin	

Table 2: Mean scores by year

Year	Medicaid Percent	Viral Suppression Percent	HIV Diagnosis Rate	Poverty Percent	No High School Degree Percent	Uninsured Percent
2008	-	-	13.57	-	-	-
2009	-	-	12.92	-	-	-
2010	-	48.15	12.38	-	-	-
2011	16.39	48.34	11.62	11.30	12.85	14.41
2012	16.61	52.05	11.24	11.33	12.33	14.07
2013	16.65	53.86	11.14	11.11	12.10	13.87
2014	18.18	57.35	11.22	10.81	11.83	11.03
2015	19.08	60.13	11.14	10.20	11.60	9.09
2016	19.39	62.96	11.22	9.59	11.20	8.30
2017	19.15	66.37	10.77	9.21	10.75	8.56
2018	18.94	68.12	10.51	9.01	10.47	8.67
2019	18.50	67.86	10.45	8.34	10.17	8.96

Source: Centers for Disease Control and Prevention 2008-2019; Kaiser Family Foundation 2011-2019.

Note: Medicaid percent, uninsured percent, poverty percent, and no high school degree percent are measured as a percent of the total state population. Viral suppression percent is measured as a percent of persons living with HIV. HIV diagnosis rate is measured as the number of cases per 100,000 state residents.

Table 3: Difference-in-differences models for Medicaid enrollment and viral suppression, N=20 states

	(1) Medicaid percent	(2) Medicaid percent	(1) Viral suppression percent	(2) Viral suppression percent
Post-treatment period (=1)	-0.18 (0.65)		9.88** (2.68)	
Treated states (=1)	0.67 (1.18)		2.72 (4.24)	
DID estimator (post-treatment × treated)	2.05* (0.75)	1.43** (0.41)	2.44 (2.73)	2.90 (2.10)
Percent in poverty	1.07*** (0.27)	1.00*** (0.14)	0.18 (1.14)	0.50 (0.98)
Percent without a HS degree	0.49 (0.32)	0.17 (0.22)	-1.06 (0.99)	1.22 (1.28)
Percent uninsured	-0.73** (0.20)	-1.07*** (0.10)	0.22 (0.60)	0.64 (0.66)
State and Year Fixed Effects	No	Yes	No	Yes
Constant	8.22** (2.46)	16.79*** (3.40)	59.36*** (8.32)	15.16 (23.06)
Observations	160	160	160	160
R ²	0.671	0.981	0.283	0.880
Adjusted R ²	0.658	0.977	0.255	0.852

Source: Centers for Disease Control and Prevention, 2012-2019; Kaiser Family Foundation 2012-2019

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4: Difference-in-differences models for Medicaid enrollment and HIV diagnoses, N=39 states

	(1) Medicaid percent	(2) Medicaid percent	(3) HIV diagnosis rate	(4) HIV diagnosis rate
Post-treatment period (=1)	0.69 (0.49)		2.03 ⁺ (1.07)	
Treated states (=1)	0.71 (0.76)		-1.73 (1.37)	
DID estimator (post- treatment × treated)	2.53*** (0.43)	2.11*** (0.30)	1.42 (0.96)	0.01 (0.62)
Percent in poverty	1.17*** (0.21)	0.71*** (0.13)	-1.16* (0.54)	-0.02 (0.17)
Percent without a HS degree	0.30 (0.21)	0.08 (0.16)	1.91*** (0.51)	0.32 (0.20)
Percent uninsured	-0.55*** (0.11)	-0.86*** (0.10)	0.49 ⁺ (0.28)	-0.13 (0.16)
State and Year Fixed Effects	No	Yes	No	Yes
Constant	7.16*** (1.94)	19.56*** (2.23)	-5.50 (3.36)	13.60* (5.45)
Observations	351	351	351	351
R ²	0.753	0.976	0.454	0.976
Adjusted R ²	0.748	0.972	0.445	0.972

Source: Centers for Disease Control and Prevention, 2011-2019; Kaiser Family Foundation 2011-2019

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5: Difference-in-differences models for HIV diagnoses, stratified by race and GBMSM, N=39 states

	(1) White diagnosis rate	(2) White diagnosis rate	(3) Black diagnosis rate	(4) Black diagnosis rate
Post-treatment period (=1)	0.97* (0.46)		2.33 (3.58)	
Treated states (=1)	0.81 (0.55)		-6.36 (5.03)	
DID estimator (post-treatment × treated)	0.59 (0.50)	-0.07 (0.27)	6.20 (4.77)	1.06 (6.47)
Percent in poverty	-0.42** (0.13)	0.00 (0.10)	-2.09+ (1.17)	1.80 (2.73)
Percent without a HS degree	0.63*** (0.11)	-0.18 (0.18)	1.11 (1.49)	1.78 (1.77)
Percent uninsured	0.27* (0.13)	-0.04 (0.09)	1.32 (0.93)	-0.69 (1.66)
State and Year Fixed Effects	No	Yes	No	Yes
Constant	-2.02 (1.51)	9.31** (3.00)	36.56** (13.08)	-2.09 (45.73)
Observations	351	351	351	351
R ²	0.468	0.909	0.059	0.603
Adjusted R ²	0.458	0.894	0.043	0.537

Source: Centers for Disease Control and Prevention, 2011-2019; Kaiser Family Foundation 2011-2019

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5 cont.: Difference-in-differences models for HIV diagnoses, stratified by race and GBMSM, N=39 states

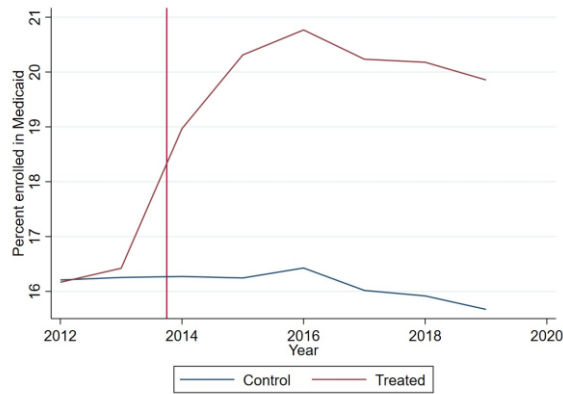
	(5) Latinx diagnosis rate	(6) Latinx diagnosis rate	(7) GBMSM diagnosis rate	(8) GBMSM diagnosis rate
Post-treatment period (=1)	0.99 (1.35)		129.13* (47.67)	
Treated states (=1)	1.58 (2.06)		-161.83* (63.68)	
DID estimator (post- treatment × treated)	-3.03+ (1.72)	-2.73+ (1.39)	-30.92 (40.20)	-23.10 (28.91)
Percent in poverty	-1.00 (0.68)	-1.09 (1.36)	25.38 (27.73)	-9.81 (9.55)
Percent without a HS degree	1.86** (0.64)	1.38+ (0.73)	53.89* (23.73)	6.54 (13.35)
Percent uninsured	-0.03 (0.35)	0.09 (0.75)	-4.75 (12.29)	-8.51 (7.84)
State and Year Fixed Effects	No	Yes	No	Yes
Constant	6.60 (4.19)	9.32 (15.08)	-281.12 (167.33)	1215.47*** (303.54)
Observations	351	351	351	351
R ²	0.204	0.669	0.498	0.969
Adjusted R ²	0.190	0.614	0.489	0.964

Source: Centers for Disease Control and Prevention, 2011-2019; Kaiser Family Foundation 2011-2019

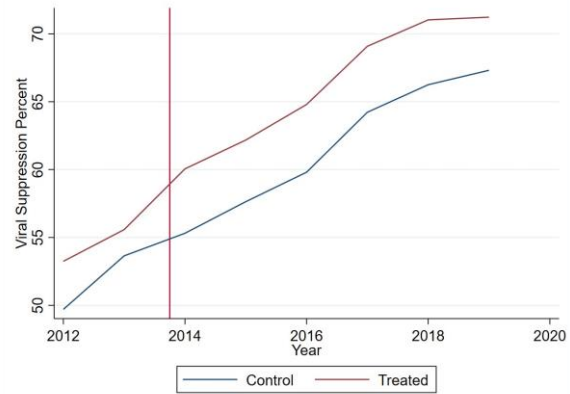
+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 1: Parallel Trends Plots

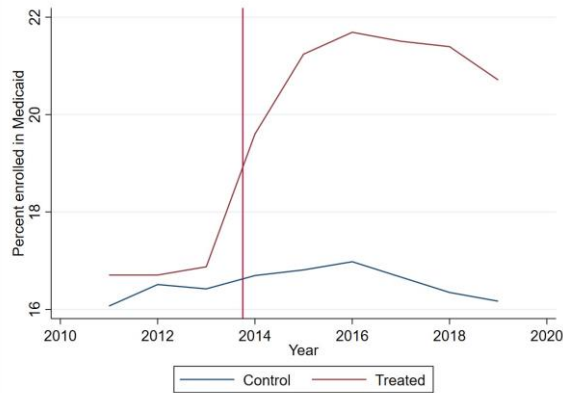
Panel A – Medicaid enrollment (20 states)



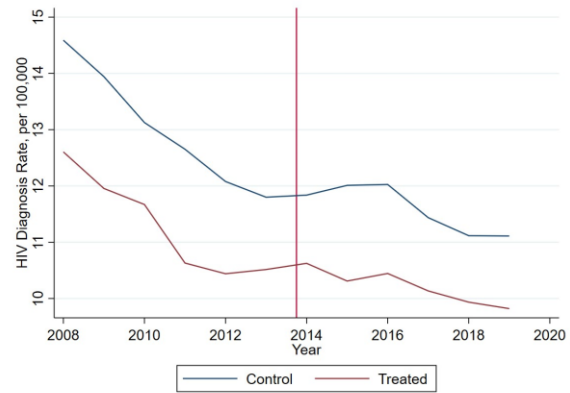
Panel B – Viral suppression (20 states)



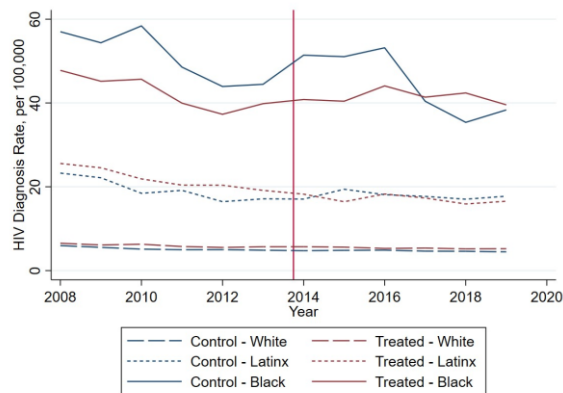
Panel C – Medicaid enrollment (39 states)



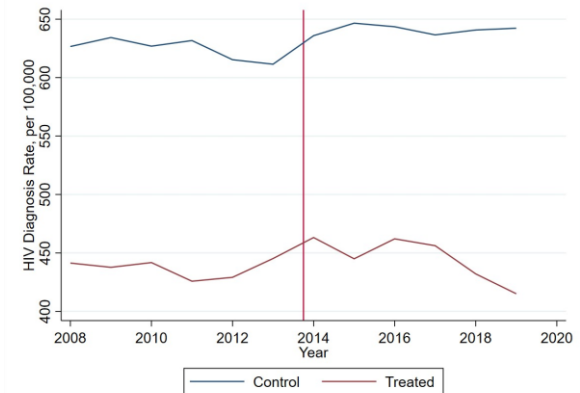
Panel D – HIV diagnoses (39 states)



Panel E – HIV diagnoses by race (39 states)

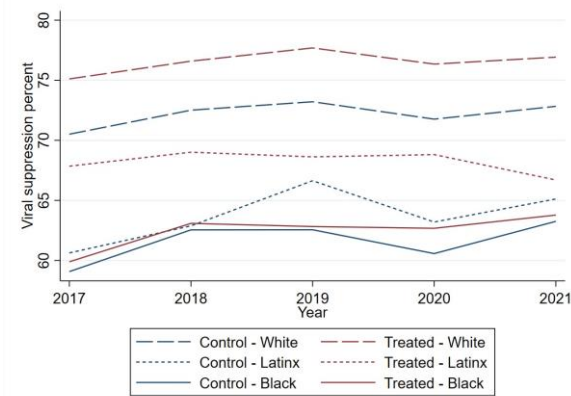


Panel F – HIV diagnoses by GBMSM (39 states)



Note: Scales are not comparable across plots.

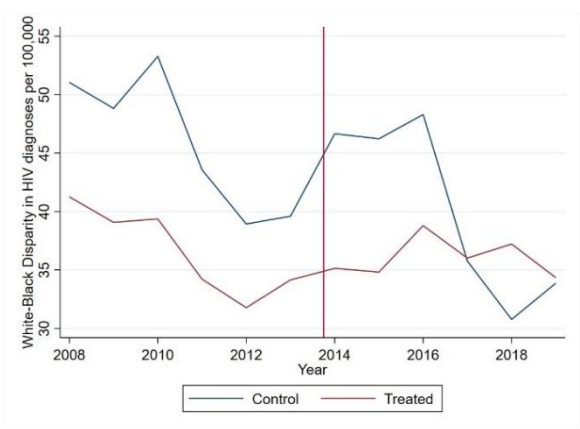
Figure 2: Viral suppression among gay, bisexual, and other cisgender men who have sex with men 2017-2021, stratified by race (20 states)



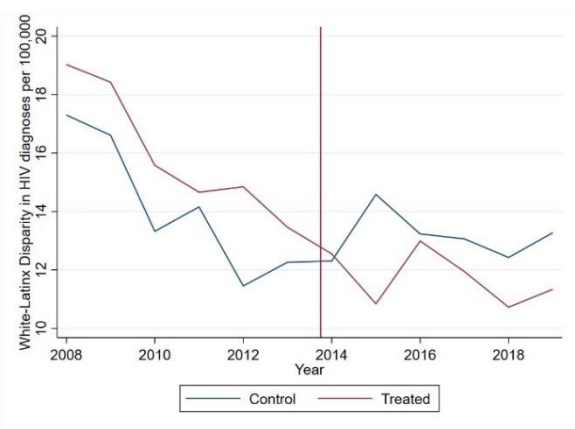
Source: Centers for Disease Control and Prevention 2017-2021

Figure 3: Descriptive trends in HIV diagnosis disparities

Panel A – White-Black Disparities (39 states)



Panel B – White-Latinx Disparities (39 states)



Chapter II Appendix A: Medicaid Expansion States

According to Kaiser Family Foundation: “Coverage under the Medicaid expansion became effective January 1, 2014 in all states that have adopted the Medicaid expansion except for the following: Michigan (4/1/2014), New Hampshire (8/15/2014), Pennsylvania (1/1/2015), Indiana (2/1/2015), Alaska (9/1/2015), Montana (1/1/2016), Louisiana (7/1/2016), Virginia (1/1/2019), Maine (1/10/2019 with coverage retroactive to 7/2/2018), Idaho (1/1/2020), Utah (1/1/2020), Nebraska (10/1/2020), Oklahoma (7/1/2021), Missouri (Processing applications beginning 10/1/2021 with coverage retroactive to 7/1/2021), South Dakota (7/1/2023), and North Carolina (Contingent upon enactment of the SFY 2023-2024 budget).”

Chapter II Appendix B: Potential Outcomes Framework

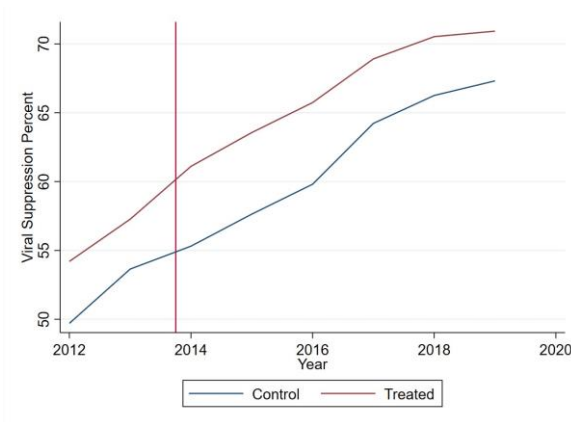
A difference-in-differences approach uses the potential outcomes framework in order to identify the causal effect of a treatment on an outcome: in this case, the expansion of Medicaid and its effects on HIV/AIDS outcomes. I will use the example of HIV diagnoses to describe the analytic approach, however I will use this approach for all dependent variables. In the potential outcomes framework, the causal quantity of interest is the difference between the HIV diagnosis rate post-expansion in the states that were treated and the HIV diagnosis rate had those states *not* been treated. In other words, if the difference between these two outcomes were zero, then there would be no causal effect of the treatment: even in the absence of treatment, the outcome would have been the same. The problem, however, is that we cannot observe what the HIV diagnosis rate would have been for those states had they not expanded Medicaid. There are only four potential outcomes that we can observe: the HIV diagnosis rate among states that expanded Medicaid *before* that expansion (alpha); the HIV diagnosis rate among states that expanded Medicaid *after* that expansion (beta); the HIV diagnosis rate among states that did not expand Medicaid *before* the other states expanded it (gamma); and finally, the HIV diagnosis rate among states that did not expand Medicaid *after* the other states expanded it (delta).

Chapter II Supplementary Information

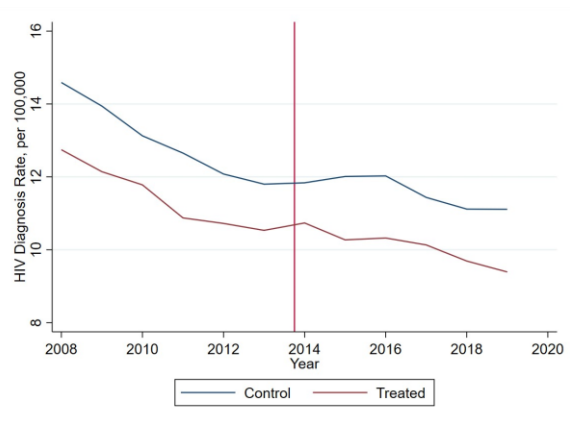
I also examine whether results change by including the “pre-treatment” states (Delaware, Massachusetts, New York, and Vermont) and the “late expansion” states as treatment (i.e., any state that expanded by the end of 2016 is included as part of the treatment instead of being excluded from the analysis). For viral suppression, this means $N=26$ instead of $N=20$ in the main results. For HIV diagnoses, this means $N=50$ instead of $N=39$ in the main results. Parallel trends plots remain parallel (see Figure S1) and difference-in-differences results remain robust to this specification (see Tables S1-S3). Results that were null remain null. The finding that Latinx Americans had reduced HIV diagnoses in the post-expansion period among the treated states is actually enhanced in this specification (see Table S3), lending robustness to the finding.

Figure S1

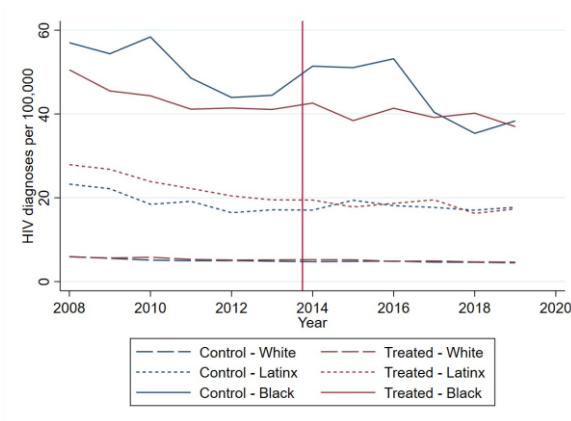
Panel A – Viral Suppression (26 states)



Panel B – HIV Diagnoses (50 States)



Panel C – HIV Diagnoses by race (50 states)



Panel D – HIV Diagnoses by GBMSM (50 states)

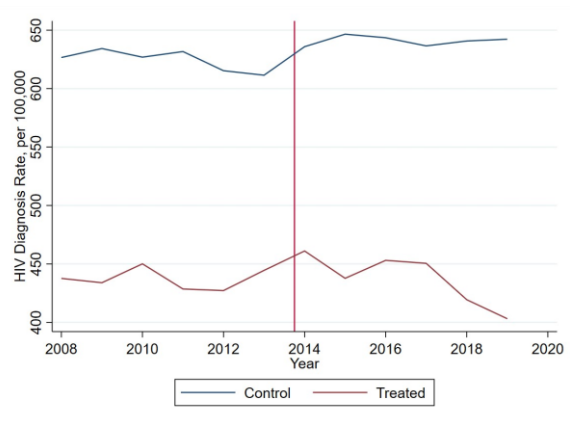


Table S1: Difference-in-differences models for viral suppression, N=26 states

	(1) Viral suppression percent	(2) Viral suppression percent
Post-treatment period (=1)	9.74*** (2.20)	
Treated states (=1)	3.82 (3.37)	
DID estimator (post- treatment × treated)	1.64 (2.50)	1.84 (2.14)
Percent in poverty	0.01 (0.84)	0.59 (0.63)
Percent without a HS degree	-1.15 (0.77)	0.20 (0.94)
Percent uninsured	0.30 (0.31)	0.59 (0.46)
State and Year Fixed Effects	No	Yes
Constant	61.26*** (6.35)	30.17+ (17.24)
Observations	208	208
R^2	0.347	0.875
Adjusted R^2	0.328	0.849

Source: Centers for Disease Control and Prevention, 2011-2019; Kaiser Family Foundation 2011-2019

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table S2: Difference-in-differences models for HIV diagnoses, N=50 states

	(1) HIV diagnosis rate	(2) HIV diagnosis rate
Post-treatment period (=1)	1.69* (0.80)	
Treated states (=1)	-0.83 (1.44)	
DID estimator (post- treatment × treated)	0.34 (0.62)	-0.17 (0.42)
Percent in poverty	-0.79 (0.51)	-0.10 (0.15)
Percent without a HS degree	2.03*** (0.42)	0.34+ (0.18)
Percent uninsured	0.19 (0.18)	-0.10 (0.13)
State and Year Fixed Effects	No	Yes
Constant	-6.84+ (3.49)	13.91** (4.20)
Observations	450	450
R^2	0.482	0.974
Adjusted R^2	0.475	0.970

Source: Centers for Disease Control and Prevention, 2011-2019; Kaiser Family Foundation 2011-2019

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table S3: Difference-in-differences models for HIV diagnoses, stratified by race and GBMSM, N=50 states

	(1) White diagnosis rate	(2) White diagnosis rate	(3) Black diagnosis rate	(4) Black diagnosis rate
Post-treatment period (=1)	0.70* (0.34)		-0.89 (3.29)	
Treated states (=1)	0.53 (0.50)		-5.43 (5.33)	
DID estimator (post- treatment × treated)	0.22 (0.33)	-0.08 (0.22)	-0.54 (3.72)	-3.67 (4.61)
Percent in poverty	-0.36** (0.13)	-0.03 (0.08)	-1.60 (1.16)	1.93 (2.04)
Percent without a HS degree	0.74*** (0.09)	-0.12 (0.13)	2.39+ (1.20)	1.56 (1.52)
Percent uninsured	0.13 (0.10)	-0.05 (0.07)	-0.17 (0.68)	-1.27 (1.13)
State and Year Fixed Effects	No	Yes	No	Yes
Constant	-2.07 (1.25)	8.98*** (2.47)	37.21** (12.50)	7.13 (35.14)
Observations	450	450	450	450
R ²	0.482	0.909	0.060	0.610
Adjusted R ²	0.475	0.894	0.048	0.549

Source: Centers for Disease Control and Prevention, 2011-2019; Kaiser Family Foundation 2011-2019

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table S3 cont.: Difference-in-differences models for HIV diagnoses, stratified by race and GBMSM, N=50 states

	(5) Latinx diagnosis rate	(6) Latinx diagnosis rate	(7) GBMSM diagnosis rate	(8) GBMSM diagnosis rate
Post-treatment period (=1)	0.11 (1.24)		160.84*** (40.77)	
Treated states (=1)	2.49 (1.92)		-108.49+ (62.42)	
DID estimator (post- treatment × treated)	-3.54** (1.27)	-2.86* (1.07)	-38.45 (30.33)	-24.72 (22.50)
Percent in poverty	-0.67 (0.67)	-0.69 (0.98)	34.66 (23.69)	-5.83 (7.68)
Percent without a HS degree	2.21*** (0.59)	1.17 (0.72)	47.00* (17.93)	5.35 (10.43)
Percent uninsured	-0.53+ (0.28)	-0.16 (0.56)	1.31 (7.47)	-6.71 (5.60)
State and Year Fixed Effects	No	Yes	No	Yes
Constant	5.82 (4.95)	10.70 (11.59)	-394.74* (167.57)	1149.71*** (232.84)
Observations	450	450	450	450
R ²	0.271	0.738	0.544	0.970
Adjusted R ²	0.261	0.697	0.538	0.965

Source: Centers for Disease Control and Prevention, 2011-2019; Kaiser Family Foundation 2011-2019

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

III. Structural Stigma and Transgender Health: Testing the Minority Stress Hypothesis across the United States

A. Abstract

In this chapter, I study how structural stigma affects the mental and physical health of gender minorities. Prejudicial environments can influence gender minority health through minority stress (Hendricks and Testa 2012; Meyer 1995, 2003). I hypothesize that gender minorities living in states with more discriminatory anti-transgender laws (i.e., greater structural stigma) will have worse mental and physical health outcomes than 1) cisgender heterosexuals living in the same area and 2) gender minorities living in more accepting environments. I test these hypotheses using the restricted dataset of the TransPop survey (Meyer 2021). This is the *first national probability sample* of transgender people in the United States, meaning it will provide the most accurate representation of transgender people's experiences. I find that, in general, transgender respondents fare worse on mental and physical health outcomes compared to their cisgender peers without taking into account structural stigma. In addition, I find that structural stigma has a significant association with poorer mental health outcomes for transgender individuals only. These results paint a disheartening picture of transgender mental health inequity, where the average baseline mental health of gender minorities is worse than cisgender individuals and anti-transgender laws exacerbate the psychological distress. These results offer a critically important public health lens on the current national debate over transgender rights.

B. Introduction

“When the speaker asks me to apologize on behalf of decorum, what he is really asking me to do is be silent when my community is facing bills that get us killed; he’s asking me to be complicit in this Legislature’s eradication of our community.” – Montana State Representative Zooey Zephyr (Robbins, Tumin, and Fortin 2023)

These words spoken by transgender representative Zooey Zephyr on the floor of the Montana state legislature were in response to proposed legislation restricting gender affirming care for minors. While the legislature voted to censure Representative Zephyr because they believed these remarks to be disruptive and hyperbolic, ongoing research efforts on the effect of anti-transgender policies and attitudes, collectively called structural stigma, demonstrate clear impacts on health and wellbeing for transgender individuals (Bränström and Pachankis 2021; Goldenberg et al. 2020; Price et al. 2023; White Hughto et al. 2016). Structural stigma is defined as, “societal-level conditions, cultural norms, and institutional policies that constrain the opportunities, resources, and wellbeing of the stigmatized.” (Hatzenbuehler 2016) While much of the structural stigma research is focused on sexual minorities, we know that gender minorities are particularly stigmatized. Gender minorities and transgender people are people whose gender identity does not align with their assigned sex (Gender Identity in U.S. Surveillance (GenIUSS) 2014).

Americans are more hostile toward transgender people than sexual minorities such as gay men, lesbians, or bisexuals (Burke et al. 2023; Lewis et al. 2017). Transgender people are four times more likely to be victims of violent crime than cisgender people (Williams Institute 2021), and these hostile attitudes are associated with higher rates of attempted suicide (Clements-Nolle, Marx, and Katz 2006). Politicians also target transgender people

for discrimination, particularly in a recent virulent wave of anti-transgender legislation sweeping through state legislatures.

The question of this study is whether these forms of structural stigma influence transgender mental and physical health outcomes. Minority stress models argue that stigmatization leads to heightened stress levels among sexual and gender minority populations (Hatzenbuehler 2009; Hendricks and Testa 2012; Meyer 1995, 2003), suggesting a pathway from stigma to morbidity. Indeed, the National Institutes of Health have incorporated structural stigma as a societal-level factor impacting sexual and gender minority health (NIH SGM Research Office 2021). Importantly, attitudes and policies toward transgender people vary across the United States, making geographically linked health data invaluable to determining how structural stigma affects transgender health. Research on structural stigma and transgender people has often relied on convenience samples (Tran et al. 2023), thus making inferences to the US transgender population tenuous. Using geographic location, I link health outcomes from the first probability sample of transgender adults, the 2016-2018 TransPop survey, with 2017 data on structural stigma, allowing me to assess how differences in structural stigma across the US are associated with disparities in mental and physical health outcomes. Because the TransPop survey includes both a transgender sample and a cisgender comparison sample, I can determine whether structural stigma, operationalized in this study as anti-transgender policies, has a specific effect on transgender morbidity.

Results from multivariate regression models demonstrate 1) transgender respondents fare worse on mental and physical health outcomes compared to their cisgender peers and 2) structural stigma has a significant association with deleterious mental health outcomes for

transgender individuals only. This model suggests that transgender individuals in the state with the most structural stigma (Georgia) may experience almost 70 *more* days of poor mental health *per year* compared to transgender individuals in the state with the least structural stigma (California). Over a lifetime, the negative impact on mental health is immense. These results have important implications for current debates on transgender rights.

In the following section, I review research on minority stress theory and empirical research on structural stigma's effect on health outcomes. Then I discuss the TransPop dataset and the variables I use in my analyses. This is followed by the results and discussion, including limitations. The conclusion highlights directions for future research and broader implications.

C. Background

Research on structural stigma builds on a robust literature focusing on the effect of structural racism and sexism on health outcomes. Structural racism has been linked to a higher likelihood of heart attacks, preterm births, and low birth weight among Black Americans (Chae et al. 2018; Lukachko, Hatzenbuehler, and Keyes 2014), and structural sexism has been linked to worse health outcomes among women (Homan 2019). In another study examining “structural intersectionality,” authors linked state-level measures of structural racism, structural sexism, and economic inequality to individual health outcomes, finding that Black women in particular face poorer health outcomes in these social contexts (Homan, Brown, and King 2021).

Structural stigma is a societal factor influencing sexual and gender minority health disparities, per the National Institutes of Health. It is defined as “societal-level conditions,

cultural norms, and institutional policies that constrain the opportunities, resources, and wellbeing of the stigmatized” (Hatzenbuehler 2016). Stigma more generally, not just structural stigma, is considered a fundamental cause of health inequality (Hatzenbuehler, Phelan, and Link 2013).

Gender minorities are more stigmatized than sexual minorities such as gay men, lesbians, or bisexuals (Burke et al. 2023; Lewis et al. 2017). This stigmatization has created an atmosphere where gender minorities are four times more likely to be victims of violent crime than cisgender people (Williams Institute 2021), and gender identity-based violence and discrimination is associated with higher rates of attempted suicide (Clements-Nolle et al. 2006). State governments also target transgender people for discrimination. An early example was the 2016 North Carolina “bathroom bill” that restricted transgender people using bathrooms consistent with their gender identity. In 2022, Texas directed its child welfare agency to investigate and prosecute parents for child abuse who provide gender-affirming care to their transgender children. In 2023, state legislatures proposed and passed a flurry of anti-transgender legislation, with many focusing on banning gender-affirming care for minors. Because these laws send a message of prejudice, intolerance, and misunderstanding, they may create an environment that can influence gender minority health through what is called “minority stress.”

Minority stress models argue that stigmatization leads to heightened stress levels among sexual and gender minority populations (Hatzenbuehler 2009; Hendricks and Testa 2012; Meyer 1995, 2003). The individual may internalize homophobia or transphobia, perceive stigma toward themselves, or experience actual incidences of discrimination, including transgender-specific stressors such as misgendering or in health care, housing, or

employment (Bradford et al. 2013; Hendricks and Testa 2012; McLemore 2018; Meyer 1995, 2003). The increased stress from these experiences is linked to increased frequency of psychiatric disorders (e.g., anxiety and depression), deleterious behaviors (e.g., substance use, drinking, and smoking), and poorer perceptions of personal health (Griffin et al. 2019; Hatzenbuehler et al. 2013; Hunter, Butler, and Cooper 2021). Furthermore, psychological stress in general is associated with poorer cardiovascular health outcomes (Ruiz et al. 2018), and sociological research emphasizes that differential exposure to stress leads to worse physical and mental health outcomes for marginalized groups (Thoits 2010). Although gender minorities are not well-studied in this stress literature, others point to clear inequalities for gender minority health (Hsieh and Shuster 2021).

The human stress hormone cortisol is a likely mediator of this pathway from stress to poor health. Chronically elevated cortisol levels are associated with a host of poor health outcomes (Adam et al. 2017). Cortisol responds to social stress, including social exclusion or rejection (Taylor 2012). Structural stigma creates the conditions for socially threatening interactions in daily life, and transgender people expect rejection in these environments (Rood et al. 2016). Transgender people living in more anti-transgender states may fear for their safety if attitudes are particularly hostile. They may feel uncomfortable going out in public or experience stress during routine activities such as using a public restroom. People in their networks such as coworkers and family members may make the workplace and family gatherings more stressful. Prejudicial policies may also engender feelings of discrimination and stigmatization, and they may literally make life harder for transgender people, including by limiting access to public accommodations, identification documents, access to hormone replacement therapy, health insurance, and adoption. These kinds of

targeted policies are not abstractly stigmatizing but have real consequences for the transgender population.

This is not the first study to address structural stigma and transgender health or health care outcomes. Researchers have found mixed results regarding structural stigma's association with health care. For example, some researchers found that transgender individuals living in states with more structural stigma are less likely to seek therapy and more likely to refuse health care (Goldenberg et al. 2020; White Hughto et al. 2016), while others did not find an association between structural stigma and health care access (Tran et al. 2023). Other researchers found that protective and inclusive transgender policies are associated with increased health care utilization, as well as better mental health and alcohol use outcomes (Du Bois et al. 2018).

With respect to mental health outcomes, studies have linked structural stigma to increased mental distress and lifetime suicidal ideation (Price et al. 2023), and decreased life satisfaction (Bränström and Pachankis 2021). On the other hand, protective nondiscrimination insurance policies implemented in some states led to decreased suicidality among transgender patients (McDowell et al. 2020). All of these studies point to important relationships between transgender health, health care outcomes, and structural stigma.

This research is intended to both corroborate and expand on these findings. Importantly, this research diverges from previous research by drawing on a probability sample of transgender adults, rather than a convenience sample. I discuss this further in the next section. I hypothesize that gender minorities living in environments with more discriminatory policies (i.e., higher structural stigma) will have worse mental and physical

health outcomes than 1) cisgender heterosexuals living in the same area and 2) gender minorities living in more accepting environments.

D. Data and Methods

I test these hypotheses using the restricted dataset of the 2016-2018 TransPop survey (Meyer 2021). This is the *first national probability sample* of transgender people in the United States, meaning it provides the most accurate population inferences for transgender people's experiences. As other scholars have noted, structural stigma research on transgender people has often relied on convenience samples (Tran et al. 2023). With a probability sample, the ability to infer results to the general population is markedly improved.

The study sampled the US population above age 18 (total n=1436), with the specific goal of obtaining a probability sample of transgender respondents (n=274), plus a cisgender comparison sample (n=1162). I used survey weights to adjust for the oversample of transgender respondents. Survey participants were eligible if they were over 18, had at least a 6th grade education, and could speak English. Respondents were screened for transgender and cisgender identity to ensure that a large enough sample of transgender people was collected. I was approved to use the restricted TransPop survey data by the Inter-University Consortium for Political and Social Research (ICPSR). Data were analyzed using the secure Virtual Data Enclave (VDE) provided by ICPSR. Most importantly, the restricted dataset allows me to access the respondents' zip codes. With this geographic data I linked health outcomes to transgender-related policies, creating a novel dataset that allows me to test how the minority stress hypothesis varies across the country.

1. Measuring Structural Stigma

To construct my measure of structural stigma I utilized data from the transgender policy tally compiled by the LGBTQ+ think tank Movement Advancement Project (MAP), which has been utilized by others to measure structural stigma (Du Bois et al. 2018). I use a 2017 report on the state of gender identity-related policies (Movement Advancement Project 2017), which provides a measure of structural stigma contemporaneous with the 2016-2018 health outcomes collected in the TransPop survey. The report's tally of pro- and anti-transgender laws fall into broad categories, including non-discrimination, marriage/relationships, adoption, youth and education, health and safety, and gender identity documentation (see Table 1a for specific laws and policies). MAP awarded positive points for laws that promote transgender equality, including partial points for local laws that cover part of the population; negative points were awarded for anti-transgender laws. Thus, states can have positive or negative scores depending on the policy landscape (minimum of -6.5, maximum of 18). This tally provides a useful continuous variable to measure structural stigma through policies. I reverse code and mean center this variable so that higher values represent more anti-transgender policies (i.e., measures more structural stigma). With this measure I can assess whether respondents living in states with more structural stigma have worse mental or physical health outcomes (see Table 1b for state tallies).

2. Dependent Variables

I examine two health outcomes in this chapter (see Table 2a). The first is a measure of the number of days of poor *mental* health. This is based on the following survey question: “Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not

good?” The second is the number of days of poor *physical* health, as measured by the following question: “Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?” These are continuous variables and allow me to use linear regression.

3. Individual-Level Variables

I use multiple variables at the individual level in order to assess their relationship with health outcomes (see Table 2b). I use race/ethnicity, measured as White, Black, Latino/a/x, and Multirace/Other. I use a continuous measure of age, mean centered as to allow a more interpretable intercept. Gender identity is self-reported as cisgender men, cisgender women, transgender men, transgender women, and gender nonbinary. Sexual minority status is self-reported as either heterosexual or a sexual minority, including lesbian, gay, bisexual, and queer. Education is measured as high school or less, some college, college, and more than college. I code health insurance status as =1 if they do *not* have health insurance. I code urbanicity as =1 if they live in an urban area. I code poverty status as =1 if their income is below 100% of the federal poverty line. I code marital status as =1 if they are in a legal partnership, including marriage, domestic partnership, or civil union. Finally, I use the distance from the nearest LGBT health center measured in miles. I transform this into 100-mile increments to make the regression coefficient large enough to interpret. According to the TransPop user guide (Krueger et al. 2020), this was calculated based on “geocoded health center data and respondents’ zip codes.” This approach was developed by Martos, Wilson, and Meyer (2017), using 2015 LGBT health center data.

4. State-Level Variables

Research suggests that the educational and religious context of a state influences the culture of tolerance (Budge 2023), which may attenuate, exacerbate, or confound the effect of structural stigma. In supplemental analyses, I include the percent of the population with a Bachelor's degree or higher and the percent of evangelical Christians in a state (American Community Survey 2016; Grammich et al. 2018). Results from the main analyses presented in the paper are not substantively changed by the addition of these state controls. The relevant coefficients remain statistically significant ($p < 0.05$) and in the same direction. For a fuller discussion of these variables, see the Supplementary Information.

5. Analytic Strategy

I first present descriptive statistics to provide an overview of the samples. Then I use multivariate regression to assess the effect of structural stigma on the outcomes. I also employ multilevel models (i.e., random-effects models) to account for clustering by state. For each dependent variable I run three models.

The minority stress hypothesis would expect that structural stigma would have a negative effect of transgender health outcomes only, not on cisgender outcomes. To test this, I utilize two approaches to determine whether there is a transgender specific effect of structural stigma on the health outcomes. First, I examine the results of the combined sample in Model 1, which allows me to assess between-group disparities in health outcomes. For example, I can compare cisgender men, cisgender women, transgender men, transgender women, and gender nonbinary respondents. I then run an interaction test in Model 2 between transgender identity and structural stigma using the combined cisgender and transgender sample. This offers a formal statistical test of a transgender specific effect of structural

stigma. I also use a split sample approach, where Model 3 uses the cisgender only sample and Model 4 uses the transgender only sample. This provides a more descriptive test of whether structural stigma has a transgender only effect. Splitting the sample also allows me to evaluate within-group disparities in health outcomes (e.g., how transgender health outcomes differ by race or education). All of these models utilize the array of individual-level variables plus the structural stigma variable.

E. Results

1. Descriptive Results

Descriptive results for the dependent and independent variables can be found in Tables 2a and 2b. Table 2a includes weighted means, standard deviations, and sample size for both dependent variables within each subsample. This provides useful comparison across the samples. Because these are weighted, the descriptive statistics can be inferred to the national population. For example, with respect to the number of days of poor mental health, the cisgender sample reports on average 5.9 days of poor mental health ($\mu=5.90$, $\sigma=8.61$, $n=1086$), whereas the transgender sample reports on average 15.1 days ($\mu=15.10$, $\sigma=10.16$, $n=210$). A similar pattern can be observed in the other dependent variable, where the transgender sample reports on average more days of poor physical health ($\mu=8.03$, $\sigma=8.73$, $n=175$) compared to the cisgender sample ($\mu=4.23$, $\sigma=7.87$, $n=1086$). These simple descriptive results demonstrate profound health disparities between cisgender and transgender populations. The question for multivariate regression will be whether these health disparities can be attributed, at least in part, to structural stigma.

Then in Table 2b, I examine the independent variables using the sample pertaining to days of poor mental health. Again, these are weighted descriptive statistics. Numerous differences can be observed between the cisgender and transgender samples: the transgender sample is younger, less White, less educated, more urban, poorer, and has fewer legal partnerships. Additionally, the transgender sample is roughly evenly divided between transgender men, transgender women, and gender nonbinary respondents. Furthermore, the average structural stigma score is slightly lower in the transgender sample compared to the cisgender sample. This could mean transgender people feel more comfortable identifying as such in states with less structural stigma, or may migrate to those states. I discuss this further below as a potential limitation of the results of this study. Multivariate regression will help identify which of these variables hold important relationships with mental and physical health outcomes.

2. Multivariate Regression – Days of Poor Mental Health

I first assess the relationship between the number of poor mental health days in the last 30 days and structural stigma (see Table 3). Model 1 utilizes the combined transgender and cisgender sample. I do not find a significant association between structural stigma and days of poor mental health in Model 1.

With respect to individual predictors, I find that age is associated with fewer poor mental health days ($\beta=-0.09$, $p<0.001$). Black respondents report fewer poor mental health days compared to White respondents ($\beta=-2.82$, $p<0.1$), while Latino/a/x and Multirace/Other respondents do not differ from White respondents. Cisgender women ($\beta=2.06$, $p<0.001$), transgender men ($\beta=3.90$, $p<0.05$), transgender women ($\beta=5.13$, $p<0.01$), and gender nonbinary respondents ($\beta=5.90$, $p<0.01$) *all* report more days of poor mental health

compared to cisgender men. Sexual minorities, such as lesbian, gay, and bisexual respondents, report more days of poor mental health compared to heterosexuals ($\beta=3.89$, $p<0.001$). Educational attainment appears to be protective, where respondents with a four-year degree or higher report fewer days of poor mental health (a 4-year degree $\beta=-2.36$, $p<0.05$; more than a 4-year degree $\beta=-1.55$, $p<0.1$). I find no effect for urbanicity, poverty status, legal partnership status, health insurance status, or distance from an LGBT health center.

Model 2 formally tests for a transgender specific effect of structural stigma on days of poor mental health through an interaction effect. Results demonstrate that structural stigma has a transgender only effect ($\beta=0.23$, $p<0.1$). Other coefficients are largely unchanged from Model 1.

Models 3 and 4 employ the cisgender and transgender only samples, respectively. This split sample approach is intended to provide an additional analysis of whether structural stigma has a transgender only effect. Importantly, I do not find evidence of an effect of structural stigma in the cisgender only sample (Model 3) but I do find a substantive and statistically significant effect of structural stigma on the number of poor mental health days in the transgender only sample (Model 4, $\beta=0.28$, $p<0.05$). This structural stigma relationship with mental health is quite substantial. Let us compare the states with the most and the least structural stigma, as measured by transgender-related policies: Georgia (most) and California (least). The distance between Georgia and California on this measure of structural stigma is 20.5. Multiplied by the coefficient of 0.28, I find that transgender respondents who live in Georgia report 5.7 more days of poor mental health compared to transgender respondents who live in California, *per 30 days*. Over the course of a year

(12×5.7 days, roughly), respondents in Georgia report 68.9 more days of poor mental health compared to those in California. Over a lifetime, the impact is substantial. I will continue discussing the implications of these results in the next section.

With respect to individual predictors within the transgender sample, I find age is also associated with fewer poor mental health days among this population ($\beta=-0.13$, $p<0.05$). Black, Latino/a/x, and Multirace/Other respondents all have coefficients suggesting they report fewer poor mental health days, however they do not statistically differ from White respondents. Similarly, transgender women and gender nonbinary respondents appear to report more days of poor mental health, which are statistically nonsignificant. Sexual minorities among the transgender sample report significantly more days of poor mental health compared to those who identify as heterosexual ($\beta=4.75$, $p<0.05$). I also find that educational attainment is protective in this sample as well, where respondents with a four-year degree or higher report fewer days of poor mental health (a 4-year degree $\beta=-3.25$, $p<0.1$; more than a 4-year degree $\beta=-4.13$, $p<0.05$).

3. Multivariate Regression – Days of Poor Physical Health

I now turn to physical health as an outcome (see Table 4). I measure this as the number of poor physical health days in the last 30 days (i.e., higher values represent poorer physical health). Model 1 employs the combined sample, allowing for comparison between cisgender and transgender respondents. I also do not find evidence of a relationship with structural stigma.

Surprisingly I find no statistically significant relationship between age and days of poor physical health. Black respondents appear to report fewer days of poor physical health compared to White respondents ($\beta=-2.07$, $p<0.1$), but Latino/a/x and Multirace/Other

respondents do not significantly differ from White respondents. Transgender women and gender nonbinary respondents report more days of poor physical health compared to cisgender men ($\beta=4.54$, $p<0.5$; $\beta=6.09$, $p<0.5$, respectively). However, cisgender women and transgender men do not significantly differ from cisgender men. Sexual minorities do not significantly differ from heterosexuals. Surprisingly, no statistically significant effect is found for educational attainment, urbanicity, poverty status, legal partnership status, health insurance status, or distance from an LGBT center.

Model 2 examines the interaction between structural stigma and transgender identity using the combined sample, however I find no statistically significant effect.

Model 3 utilizes the cisgender only sample. The results are essentially unchanged from Model 1, including finding no statistically significant evidence of a relationship between structural stigma and physical health in this population.

Model 4 uses the transgender only sample. No statistically significant relationship is found for structural stigma here either. I again find that age has no relationship, defying expectation that increasing age would be associated with more poor physical health days. There do not appear to be any statistically significant racial differentials on this outcome within the transgender sample. Transwomen and gender nonbinary respondents have coefficients that suggest they report more poor physical health days compared to transgender men, however they are not statistically different. The sample size is small enough though that it may not be able to distinguish. I do find that living in an urban area is associated with fewer poor physical health days ($\beta=-4.12$, $p<0.01$), while being in a legal partnership is associated with more poor physical health days ($\beta=3.87$, $p<0.1$). I discuss these results and their implications in the next section.

F. Discussion

These results demonstrate that structural stigma as measured by anti-transgender policies is associated with worse mental health outcomes for transgender Americans, corroborating and building upon previous research (Du Bois et al. 2018; Price et al. 2023). The relationship between structural stigma and the number of days of poor mental health among transgender Americans was confirmed by the interaction and split sample approaches. These approaches demonstrate that this effect of structural stigma on mental health is transgender specific, aligning with theoretical expectations. Specifically, I find that transgender respondents who live in the state with the highest structural stigma (Georgia) report on average 5.7 more days of poor mental health compared to transgender respondents who live in the state with the lowest structural stigma (California), *per 30 days*.

This is an imperfect measure, as some respondents may have fared better or worse than usual at the time the survey was taken, and there are often problems with recall on these kinds of measures. We can examine the 95% confidence interval around the regression coefficient to get a better sense of the uncertainty in the point estimate. The lower limit of the 95% confidence interval (0.05) suggests that transgender respondents experience 1 more day of poor mental health in Georgia than California, while the upper limit (0.51) suggests they experience 10.5 more days of poor mental health, *per 30 days*. This means in places with high structural stigma such as Georgia, transgender individuals may experience an additional 3 – 30% of a month in mental distress on average compared to an individual in a low structural stigma state (i.e., 1 – 10 days out of 30 days). In terms of public health and health equity, this is an unacceptable health disparity.

Structural stigma, as measured by transgender-related policies, has become worse in some states and better in others since this survey and my measure of structural stigma were measured (i.e., 2016-2018 survey, 2017 transgender policies). Whereas the distance between the highest and lowest structural stigma states in 2017 was 20.5, in 2023 it was 32.5 (Movement Advancement Project 2023). If the relationship between structural stigma and mental health as measured here were also true in 2023, it would suggest that a transgender individual living in the state with the highest structural stigma state would experience 9 more days of poor mental health per 30 days on average compared to a transgender individual in the state with the lowest structural stigma. These results have major implications for the current national debate on transgender rights and its backlash. This backlash and the policies cementing it into law may cause severe mental harm to transgender people. The youth suicide and mental health crisis could also be exacerbated by these anti-transgender laws that stigmatize and target transgender youth, particularly through banning gender affirming care for minors. However, one of the major limitations of this research is the inability to look at outcomes under the age of 18. This is something that future research may want to prioritize.

While I do not find a statistically significant association between structural stigma and physical health, a null result is not conclusive evidence of no relationship. Furthermore, descriptive results demonstrate profound disparities in physical health between transgender and cisgender individuals, and even within the transgender community itself. Gender nonbinary individuals in particular report worse mental and physical health outcomes. This finding may be attributable to perceived gender nonconformity, which other research has identified as a major source of stigma and discrimination that leads to more challenging

health outcomes (Miller and Grollman 2015). Transgender women also tend to have poorer mental and physical health outcomes compared to cisgender men. Transgender men, on the other hand, tend to have largely similar physical health compared to cisgender men, but poorer mental health on average. Transgender men may be beneficiaries of some of the privileges of masculinity (Schilt 2010), which could confer health benefits. These results provide evidence that hegemonic masculinity may be playing a role in health outcomes, producing a constellation of gendered health outcomes where masculine, feminine, and nonconforming gender identities and presentations are hierarchized.

The other sociodemographic correlates offer an interesting window into disparities within samples. For example, sexual minorities tend to report poorer mental and physical health outcomes, even within the transgender sample itself, providing further evidence that the transgender community is not a monolith and that sexuality adds another facet to transgender health outcomes. Racial disparities within samples were muted in these results, and in fact some evidence pointed to better mental and physical health outcomes among Black respondents in the combined and cisgender sample. The TransPop cisgender and transgender samples were largely White (approximately 80% in the combined sample), which makes the estimates for racial minorities less reliable.

This study also offers methodological insights on measuring structural stigma. While other studies have done a more comprehensive overview of this topic (e.g., Price et al. 2023), this study provides an empirical case of using a measure of structural stigma. The measures for transgender policies, social attitudes toward transgender people, and Republican voting percentages are colinear and highly correlated ($r > 0.8$), which leaves open which is the preferred measure of structural stigma. Transgender policies can be reliably

measured and is transgender-specific, making it a probable valid measure of structural stigma. Social attitudes are less reliable as a measure of structural stigma. For one, self-reported attitudes are subject to social desirability bias, and two, estimating state-level averages from public opinion surveys is less reliable given smaller sample sizes within states. However, it is likely a valid measure of structural stigma. Then, the percent of Republican voters has also been used as a proxy for structural stigma, and is more reliably measured. However, this measure is not transgender-specific, making it less valid and unclear whether the association is due to structural stigma specifically, or some other confounding factor related to Republican political dominance. Based on these factors, I recommend using the Movement Advancement Project's transgender policy tally as a reliable and valid measure of transgender-specific structural stigma.

1. Limitations

One important limitation of this study is the small transgender sample size. Although the transgender sample is probability based and an oversample, it remains rather small, limiting the power of analyses that break up the sample, such as analyzing by state or race. However, utilizing multilevel models enhances the ability of the data to speak to the effect of structural stigma across states. This is because the number of respondents in each state matters less than the number of states (i.e., the number of observations within groups is less important than the number of groups). The multilevel model clusters the standard errors by state, but then models the effect of structural stigma across states taking into account local variation. Essentially it just creates different intercepts for each state. These estimates for state intercepts may be dubious (since they are based on small samples within states), but the estimate for the effect of structural stigma is more stable.

These results are also correlational and not causal. One threat to validity is whether transgender individuals who have better psychological resilience are more likely to migrate to states with more welcoming environments. These individuals may be better equipped to undertake the daunting task of uprooting and moving somewhere with less structural stigma. If this were systematically true, it could undermine the results of this study: rather than finding a significant relationship between structural stigma and worse mental health outcomes, it could be that there is simply a concentration of transgender individuals with better mental health in states with lower structural stigma. Unfortunately, the TransPop dataset does not measure respondent place of birth, limiting my ability to address this threat to validity.

Causal research designs are difficult in this setting. Obviously individuals cannot be randomly assigned to states with high and low structural stigma. But even quasi-experimental designs such as difference-in-differences, regression discontinuity, and instrumental variables are difficult to construct. Instrumental variable designs require a third variable related to transgender policies but not directly related to mental health outcomes. Difference-in-differences requires over time trends, which is largely impossible at this point given the paucity of historic data measuring gender identity. Future research may be able to implement difference-in-differences as more gender identity related data is collected. Regression discontinuity is a possible research design in this setting. There would need to be enough transgender data to compare, for example, a community in Illinois versus a community across the border in Missouri. Researchers would need to ensure that the “treatment” of transgender-related policies are restricted to their respective state residents.

G. Conclusion

This study set out to assess the relationship between structural stigma and transgender mental and physical health outcomes. While I find no evidence in this study for a relationship with physical health, the results are clear that more anti-transgender policies are correlated with worse mental health outcomes. Combined with evidence from other studies focused on structural stigma, it appears that transgender people face large obstacles in attaining positive mental health outcomes, a circumstance likely attributable to the stigmatizing and prejudicial atmosphere cultivated by attitudes and policies.

The United States is in the midst of a virulent wave of anti-transgender legislation and backlash to the progress of the LGBTQ+ rights movement. States have made it harder to access gender-affirming care, gender-affirming identification documents, public accommodations consistent with gender identity, and even to discuss sexual and gender identity in schools. At the same time, other states in the nation have expanded or moved to institutionalize protections for transgender people, creating environments that are more explicitly welcoming and accepting.

Future research could include more qualitative research on the impact of living in states with more discriminatory laws and attitudes. This may more clearly illuminate the pathway of how these effects of structural stigma “get under the skin.” More demographic and quantitative research on gender minority health is always important. In particular, more scientific surveys of the transgender population in the US are critical. Transgender youth may be especially important to measure stress and stigma as they are increasingly targeted by state legislation and are at the heart of American culture wars. The effect of laws and attitudes may be particularly acute among this vulnerable population, who may be less able

to cope with the effects of stigma. Finally, research should also move to examine “trans joy” as an antidote to the overwhelming focus on negative outcomes for transgender people (shuster and Westbrook 2022), a discursive shift that the next chapter takes on.

Chapter III References

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Table 1a: Transgender Policies Measured by Movement Advancement Project

Policies	Points for negative law	Points for positive law
Non-discrimination laws		
Private employment non-discrimination laws	n/a	1
Public employment non-discrimination laws	n/a	0.5
Housing non-discrimination laws	n/a	1
Public accommodations non-discrimination laws	n/a	1
Credit and lending non-discrimination laws	n/a	1
(Negative) State religious exemption laws	-0.5	n/a
(Negative) State bans cities and counties from passing non-discrimination laws	-0.5	n/a
LGBT youth laws		
Non-discrimination laws and LGBT student policies	n/a	1
Anti-bullying laws and LGBT student policies	n/a	1
Protections for LGBT youth in foster care	n/a	1
Conversion therapy bans covering LGBT youth	n/a	1
(Negative) “Don’t Say Gay” laws barring or explicitly restricting educators from discussing LGBT people or issues in schools	-0.5	n/a
(Negative) Bans local schools and districts from passing LGBT non-discrimination and/or anti-bullying policies	-0.5	n/a
Health and Safety		
Hate crimes laws covering LGBT people	n/a	1
Private health insurance non-discrimination laws	n/a	1
Health insurance providers banned from excluding coverage from transgender-specific care	n/a	1
(Negative) State Medicaid policies related to coverage for transgender people	-1	1
Transgender inclusive health benefits for state employees	n/a	0.5
(Negative) State criminalizes exposure to and/or transmission of HIV	-0.5	n/a
Identity documents		
Driver’s licenses	-1	1
Birth certificates	-1	1
Name changes	-1	1
Adoption and parenting		
Adoption non-discrimination protections	n/a	1
Foster care non-discrimination protections	n/a	1
Total policy tally	-6.5	18

Source: Movement Advancement Project 2017, pages 17-21.

Table 1b: Transgender Policies and Structural Stigma by State

State	Gender Identity Policy Tally	Structural Stigma
Georgia	-4.5	25
Tennessee	-3.5	24
Nebraska	-3	23.5
Alabama	-2.5	23
Louisiana	-2.5	23
Oklahoma	-2.5	23
Arizona	-2	22.5
Wyoming	-2	22.5
Idaho	-1.75	22.25
North Dakota	-1.75	22.25
Kansas	-1.75	22.25
Arkansas	-1.5	22
South Dakota	-1.5	22
West Virginia	-1.5	22
South Carolina	-1.5	22
North Carolina	-1.25	21.75
Ohio	-1	21.5
Montana	-1	21.5
Texas	-0.75	21.25
Mississippi	-0.75	21.25
Missouri	-0.75	21.25
Wisconsin	-0.5	21
Kentucky	-0.25	20.75
Michigan	0.25	20.25
Virginia	0.25	20.25
Alaska	0.75	19.75
Indiana	0.75	19.75
Florida	1	19.5
New Hampshire	1.25	19.25
Iowa	3	17.5
Utah	3	17.5
Pennsylvania	4.75	15.75
Delaware	5.5	15
New Mexico	6	14.5
Maine	6.5	14
New Jersey	8	12.5
Hawaii	8	12.5
Nevada	8	12.5
Colorado	9.5	11
Maryland	9.5	11
Minnesota	10	10.5
New York	10.5	10

Illinois	11	9.5
Rhode Island	12	8.5
Connecticut	12.25	8.25
Massachusetts	12.75	7.75
Oregon	13.25	7.25
Vermont	13.5	7
Washington	13.5	7
District of Columbia	14	6.5
California	16	4.5

Source: Movement Advancement Project 2017

Table 2a: Descriptive statistics of dependent variables (weighted)

	Combined Sample			Cisgender Sample			Transgender Sample		
	Mean	SD	n	Mean	SD	n	Mean	SD	n
Days of poor mental health	5.93	8.64	1296	5.90	8.61	1086	15.10	10.16	210
Days of poor physical health	4.25	7.87	1261	4.23	7.87	1086	8.03	8.74	175

Source: TransPop 2016-2018

Table 2b: Descriptive statistics of independent variables predicting days of poor mental health (weighted)

	Combined Sample (n=1296)		Cisgender Sample (n=1086)		Transgender Sample (n=210)	
	Mean	SD	Mean	SD	Mean	SD
Individual-Level Variables						
Age	48.49	16.95	48.55	16.93	31.08	12.76
Race/Ethnicity						
White	0.73	0.44	0.73	0.44	0.58	0.49
Black	0.11	0.31	0.11	0.31	0.10	0.30
Latino/a/x	0.09	0.28	0.09	0.28	0.14	0.35
Multirace/Other	0.08	0.26	0.08	0.26	0.17	0.38
Gender Identity						
Cis man	0.485	0.50	0.49	0.50	n/a	n/a
Cis woman	0.511	0.50	0.51	0.50	n/a	n/a
Transgender man	0.001	0.03	n/a	n/a	0.30	0.46
Transgender woman	0.001	0.04	n/a	n/a	0.37	0.48
Gender nonbinary	0.001	0.03	n/a	n/a	0.33	0.47
Sexual Orientation						
Straight/Heterosexual	0.90	0.30	0.90	0.30	0.14	0.35
Sexual minority (LGBQ+)	0.10	0.30	0.10	0.30	0.86	0.35
Education						
High school degree or less	0.31	0.46	0.31	0.46	0.44	0.50
Some college	0.32	0.47	0.32	0.47	0.32	0.47
College	0.21	0.40	0.21	0.40	0.14	0.35
More than college	0.17	0.37	0.17	0.37	0.09	0.29
Urbanicity						
Non-urban	0.21	0.41	0.21	0.41	0.16	0.36
Urban	0.79	0.41	0.79	0.41	0.84	0.36
Poverty Status						
Not in poverty	0.85	0.36	0.85	0.36	0.74	0.44
Yes in poverty	0.15	0.36	0.15	0.36	0.26	0.44
Partnership Status						
No legal partnership	0.48	0.50	0.48	0.50	0.88	0.33
Legal partnership	0.52	0.50	0.52	0.50	0.12	0.33
Health Insurance Status						

Has health insurance	0.93	0.25	0.93	0.25	0.91	0.29
Does not have health insurance	0.07	0.25	0.07	0.25	0.09	0.29
Miles away from nearest LGBT health center (in 100 miles)	0.73	2.06	0.73	2.06	0.55	1.55
State-Level Variables						
Structural stigma	16.09	6.74	16.10	6.74	14.09	6.73
Percent college graduates	30.24	4.40	30.23	4.40	31.54	4.30
Percent evangelical Christians	18.06	9.90	18.07	9.90	15.50	7.73

Source: American Community Survey 2016; Grammich et al. 2018; Movement Advancement Project 2017; TransPop 2016-2018

Table 3: Multilevel linear regression model predicting number of poor mental health days in the last 30 days

	Model 1: Combined	Model 2: Interaction	Model 3: Cisgender	Model 4: Transgender
Individual Level				
Age	-0.09*** (0.02)	-0.09*** (0.02)	-0.09*** (0.02)	-0.13* (0.06)
Black (ref=White)	-2.82+ (1.58)	-2.83+ (1.58)	-2.82+ (1.59)	-4.44 (3.13)
Latino/a/x (ref=White)	-1.49 (1.23)	-1.48 (1.23)	-1.48 (1.24)	-0.72 (3.18)
Multirace/Other (ref=White)	1.70 (1.61)	1.70 (1.60)	1.73 (1.62)	-2.60 (2.31)
Cis woman (ref=Cis man)	2.06*** (0.58)	2.06*** (0.58)	2.05*** (0.58)	
Transgender man (ref=Cis man)	3.90* (1.69)	4.21* (1.73)		
Transgender woman (M1 ref=Cis man; M3 ref=Trans man)	5.13** (1.75)	5.39** (1.89)		2.25 (1.54)
Gender nonbinary (M1 ref=Cis man; M3 ref=Trans man)	5.90** (1.87)	6.97*** (1.86)		2.64 (1.92)
Sexual minority identity (=1)	3.89*** (1.07)	3.90*** (1.07)	3.88*** (1.07)	4.75* (2.34)
Some college (ref=HS or less)	1.16 (0.97)	1.16 (0.97)	1.17 (0.98)	-0.63 (1.71)
College (ref=HS or less)	-2.36* (1.02)	-2.36* (1.02)	-2.34* (1.02)	-3.25+ (1.90)
More than college (ref=HS or less)	-1.55+ (0.90)	-1.56+ (0.90)	-1.54+ (0.91)	-4.13* (1.72)
Urban (=1)	-1.00 (0.90)	-1.00 (0.90)	-1.01 (0.90)	2.41 (2.75)
Yes in poverty (=1)	1.36 (1.21)	1.37 (1.21)	1.38 (1.22)	-0.43 (2.50)
Legal partnership (=1)	-0.45 (0.79)	-0.45 (0.79)	-0.46 (0.79)	1.66 (1.90)
No health insurance (=1)	0.01 (2.37)	0.00 (2.36)	0.00 (2.38)	1.18 (2.83)
Miles away from nearest LGBT health center (in 100 miles)	-0.09 (0.07)	-0.09 (0.07)	-0.09 (0.08)	0.43 (0.31)
State Level				
Structural stigma	0.00 (0.06)	0.00 (0.06)	0.00 (0.06)	0.28* (0.12)
Transgender identity x Structural Stigma		0.23+ (0.12)		
Constant	5.55*** (1.16)	5.55*** (1.16)	5.55*** (1.16)	6.51 (4.08)
Var(state)	4.15*** (1.78)	4.09*** (1.75)	4.19*** (1.80)	0.00*** (0.00)
Var(individual)	61.19*** (5.69)	61.20*** (5.68)	61.05*** (5.70)	86.94*** (7.27)
Observations	1296	1296	1086	210
AIC	9290.82	9292.88	9248.39	73.32

Source: Movement Advancement Project 2017; TransPop 2016-2018

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4: Multilevel linear regression model predicting number of poor physical health days in the last 30 days

	Model 1: Combined	Model 2: Interaction	Model 3: Cisgender	Model 4: Transgender
Individual Level				
Age	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)	0.06 (0.05)
Black (ref=White)	-2.07 ⁺ (1.21)	-2.07 ⁺ (1.21)	-2.08 ⁺ (1.21)	0.47 (2.38)
Latino/a/x (ref=White)	0.25 (1.42)	0.25 (1.42)	0.26 (1.42)	-1.20 (1.56)
Multirace/Other (ref=White)	-0.74 (0.80)	-0.74 (0.80)	-0.75 (0.80)	0.93 (2.31)
Cis woman (ref=Cis man)	0.86 (0.68)	0.86 (0.68)	0.86 (0.68)	
Transgender man (ref=Cis man)	0.32 (1.23)	0.86 (1.12)		
Transgender woman (M1 ref=Cis man; M3 ref=Trans man)	4.54 [*] (1.92)	4.53 [*] (1.87)		2.03 (1.66)
Gender nonbinary (M1 ref=Cis man; M3 ref=Trans man)	6.09 [*] (2.65)	5.88 [*] (2.59)		3.66 (2.36)
Sexual minority identity (=1)	1.31 (1.27)	1.31 (1.27)	1.31 (1.27)	2.06 (1.78)
Some college (ref=HS or less)	0.25 (0.87)	0.25 (0.87)	0.24 (0.88)	1.27 (1.88)
College (ref=HS or less)	-1.30 (1.12)	-1.30 (1.12)	-1.31 (1.12)	2.58 (1.75)
More than college (ref=HS or less)	-0.59 (0.91)	-0.59 (0.90)	-0.59 (0.91)	-1.10 (2.47)
Urban (=1)	-0.27 (0.78)	-0.27 (0.78)	-0.26 (0.78)	-4.12 ^{**} (1.48)
Yes in poverty (=1)	2.41 (1.89)	2.41 (1.89)	2.41 (1.90)	0.34 (1.37)
Legal partnership (=1)	0.69 (0.89)	0.69 (0.89)	0.69 (0.89)	3.87 ⁺ (2.19)
No health insurance (=1)	-1.43 (1.17)	-1.43 (1.17)	-1.44 (1.17)	-2.10 (1.59)
Miles away from nearest LGBT health center (in 100 miles)	-0.07 (0.05)	-0.07 (0.05)	-0.07 (0.05)	0.29 (0.24)
State Level				
Structural stigma	-0.02 (0.06)	-0.01 (0.06)	-0.01 (0.06)	-0.06 (0.11)
Transgender identity x Structural Stigma	-	-0.03 (0.13)	-	-
Constant	3.68 ^{**} (1.14)	3.68 ^{**} (1.14)	3.68 ^{**} (1.15)	7.93 ^{**} (2.88)
Var(state)	3.79 ^{***} (1.49)	3.75 ^{***} (1.47)	3.82 ^{***} (1.50)	0.00 ^{***} (0.00)
Var(individual)	56.50 ^{***} (6.46)	56.51 ^{***} (6.45)	56.44 ^{***} (6.46)	63.35 ^{***} (13.47)
Observations	1261	1261	1086	175
AIC	9181.08	9183.16	9147.34	64.97

Source: Movement Advancement Project 2017; TransPop 2016-2018

⁺ $p < 0.1$, ^{*} $p < 0.05$, ^{**} $p < 0.01$, ^{***} $p < 0.001$

Chapter III Supplementary Information

Research suggests that the educational and religious context of a state influences the culture of tolerance (Budge 2023), which may attenuate, exacerbate, or confound the effect of structural stigma. Here, I include the percent of the population with a Bachelor's degree or higher and the percent of evangelical Christians in a state, mean centered (American Community Survey 2016; Grammich et al. 2018). I also initially included a measure of the percent who voted Republican in the 2016 presidential election (The American Presidency Project 2016), however this measure is highly colinear with my measure of structural stigma ($r > 0.8$). This is not surprising given the political context around many of these transgender-related policies. Indeed, other researchers have used the percent who voted Republican as a proxy measure for structural stigma (e.g., White Hughto et al. 2016).

Results for these supplemental analyses are presented alongside the main results here. The statistical significance of structural stigma on the mental health outcome among the transgender population is unchanged with the addition of these two state controls. In fact, the effect size increases. However, it appears that the addition of the percent of evangelical Christians may be artificially inflating this. While they are not highly colinear (e.g., $r = 0.67$), it appears that multicollinearity may be a problem here as well. When I examine the percent of evangelical Christians as its own predictor without structural stigma or percent college graduates, it is not statistically or substantively significant (coefficient size close to zero). With the addition of structural stigma is when it is quite substantively and statistically significant, and in the opposite direction of structural stigma even though we would expect percent evangelical Christian to predict worse mental health outcomes among transgender people, not better.

Table S1: Multilevel linear regression model predicting number of poor mental health days in the last 30 days

	Model 1: Combined	Model 2: Interaction	Model 3: Cisgender	Model 4: Transgender
Individual Level				
Age	-0.09*** (0.02)	-0.09*** (0.02)	-0.09*** (0.02)	-0.13* (0.06)
Black (ref=White)	-2.84+ (1.58)	-2.84+ (1.58)	-2.83+ (1.58)	-3.52 (3.10)
Latino/a/x (ref=White)	-1.47 (1.25)	-1.46 (1.25)	-1.46 (1.25)	-0.50 (3.01)
Multirace/Other (ref=White)	1.75 (1.61)	1.75 (1.61)	1.78 (1.63)	-1.73 (2.41)
Cis woman (ref=Cis man)	2.04*** (0.58)	2.04*** (0.58)	2.04*** (0.58)	
Transgender man (ref=Cis man)	3.90* (1.69)	4.22* (1.75)		0.00 (.)
Transgender woman (M1 ref=Cis man; M3 ref=Trans man)	5.12** (1.74)	5.40** (1.89)		2.34+ (1.36)
Gender nonbinary (M1 ref=Cis man; M3 ref=Trans man)	5.90** (1.86)	6.91*** (1.83)		2.25 (1.83)
Sexual minority identity (=1)	3.87*** (1.06)	3.88*** (1.06)	3.86*** (1.06)	5.58* (2.31)
Some college (ref=HS or less)	1.16 (0.98)	1.15 (0.98)	1.17 (0.98)	-0.59 (1.61)
College (ref=HS or less)	-2.35* (1.02)	-2.35* (1.02)	-2.34* (1.02)	-3.81* (1.83)
More than college (ref=HS or less)	-1.56+ (0.90)	-1.56+ (0.90)	-1.55+ (0.91)	-4.46* (1.80)
Urban (=1)	-1.03 (0.91)	-1.02 (0.91)	-1.03 (0.91)	1.18 (2.91)
Yes in poverty (=1)	1.39 (1.22)	1.40 (1.23)	1.41 (1.23)	-0.28 (2.32)
Legal partnership (=1)	-0.46 (0.78)	-0.46 (0.78)	-0.47 (0.78)	2.57 (1.61)
No health insurance (=1)	0.01 (2.38)	0.01 (2.37)	0.00 (2.39)	0.70 (2.88)
Miles away from nearest LGBT health center (in 100 miles)	-0.09 (0.07)	-0.10 (0.07)	-0.09 (0.07)	0.26 (0.29)
State Level				
Structural stigma	0.06 (0.10)	0.06 (0.10)	0.06 (0.10)	0.49** (0.16)
Transgender identity x Structural Stigma		0.21+ (0.12)		
Percent college graduates	0.08 (0.12)	0.08 (0.12)	0.08 (0.12)	-0.21 (0.22)
Percent evangelical Christian	-0.01 (0.06)	-0.02 (0.06)	-0.01 (0.06)	-0.41** (0.13)
Constant	5.56*** (1.16)	5.56*** (1.16)	5.56*** (1.16)	6.60+ (3.98)
Var(state)	3.97** (1.77)	3.92** (1.74)	4.02** (1.79)	0.00*** (0.00)
Var(individual)	61.21*** (5.68)	61.22*** (5.68)	61.07*** (5.70)	82.03*** (6.88)
Observations	1296	1296	1086	210

<i>AIC</i>	9294.11	9296.16	9251.70	77.04
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Source: American Community Survey 2016; Grammich et al. 2018; Movement Advancement Project 2017; TransPop 2016-2018
⁺ $p < 0.1$, ^{*} $p < 0.05$, ^{**} $p < 0.01$, ^{***} $p < 0.001$

Table S2: Multilevel linear regression model predicting number of poor physical health days in the last 30 days

	Model 1: Combined	Model 2: Interaction	Model 3: Cisgender	Model 4: Transgender
Individual Level				
Age	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)	0.06 (0.06)
Black (ref=White)	-2.02 ⁺ (1.19)	-2.02 ⁺ (1.19)	-2.03 ⁺ (1.19)	0.48 (2.40)
Latino/a/x (ref=White)	0.26 (1.43)	0.26 (1.43)	0.27 (1.43)	-0.97 (1.55)
Multirace/Other (ref=White)	-0.71 (0.81)	-0.71 (0.81)	-0.72 (0.81)	1.50 (2.19)
Cis woman (ref=Cis man)	0.86 (0.68)	0.86 (0.68)	0.86 (0.68)	
Transgender man (ref=Cis man)	0.31 (1.23)	0.83 (1.13)		
Transgender woman (M1 ref=Cis man; M3 ref=Trans man)	4.53 [*] (1.92)	4.54 [*] (1.86)		2.00 (1.61)
Gender nonbinary (M1 ref=Cis man; M3 ref=Trans man)	6.08 [*] (2.66)	5.85 [*] (2.59)		3.45 (2.23)
Sexual minority identity (=1)	1.30 (1.27)	1.31 (1.27)	1.30 (1.27)	2.12 (1.90)
Some college (ref=HS or less)	0.27 (0.87)	0.27 (0.87)	0.26 (0.87)	1.08 (1.81)
College (ref=HS or less)	-1.27 (1.12)	-1.27 (1.12)	-1.28 (1.12)	2.18 (1.80)
More than college (ref=HS or less)	-0.57 (0.90)	-0.57 (0.90)	-0.57 (0.90)	-1.56 (2.62)
Urban (=1)	-0.26 (0.78)	-0.26 (0.78)	-0.25 (0.78)	-4.90 ^{***} (1.36)
Yes in poverty (=1)	2.44 (1.90)	2.44 (1.90)	2.44 (1.91)	0.45 (1.31)
Legal partnership (=1)	0.68 (0.89)	0.68 (0.89)	0.68 (0.89)	4.85 [*] (2.11)
No health insurance (=1)	-1.40 (1.16)	-1.40 (1.16)	-1.41 (1.16)	-1.72 (1.60)
Miles away from nearest LGBT health center (in 100 miles)	-0.08 ⁺ (0.04)	-0.08 ⁺ (0.04)	-0.08 ⁺ (0.04)	0.22 (0.22)
State Level				
Structural stigma	0.03 (0.07)	0.03 (0.07)	0.03 (0.07)	0.17 (0.17)
Transgender identity x Structural Stigma		-0.05 (0.13)		
Percent college graduates	-0.02 (0.11)	-0.02 (0.11)	-0.02 (0.11)	0.29 (0.28)
Percent evangelical Christian	-0.05 (0.05)	-0.05 (0.05)	-0.05 (0.05)	-0.17 (0.14)
Constant	3.66 ^{**} (1.13)	3.66 ^{**} (1.13)	3.66 ^{**} (1.13)	8.32 ^{**} (2.98)
Var(state)	3.62 ^{**} (1.51)	3.59 ^{**} (1.50)	3.65 ^{**} (1.53)	0.00 ^{***} (0.00)
Var(individual)	56.51 ^{***} (6.45)	56.52 ^{***} (6.45)	56.45 ^{***} (6.46)	61.01 ^{***} (12.76)
Observations	1261	1261	1086	175

<i>AIC</i>	9184.21	9186.27	9150.47	68.82
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Source: American Community Survey 2016; Grammich et al. 2018; Movement Advancement Project 2017; TransPop 2016-2018
⁺ $p < 0.1$, ^{*} $p < 0.05$, ^{**} $p < 0.01$, ^{***} $p < 0.001$

IV. Sources of Strength: Assessing the Social Determinants of Resilience among Transgender Adults

A. Abstract

The third empirical chapter focuses on the social determinants of transgender resilience. While gender minorities experience major health disparities in the United States (Hsieh and Shuster 2021; Scheim et al. 2022), researchers have also called for more attention to the strengths of LGBTQ+ people, such as resilience to overcome stress and stigma (Colpitts and Gahagan 2016). This shift in focus is supported by the inclusion of resilience in the minority stress framework (Meyer 2015). Thus far research on psychological resilience in the minority stress model has focused primarily on understanding whether and how resilience factors affect mental health outcomes. However, little research has examined resilience as an outcome itself to understand its social determinants. This empirical chapter explores the social determinants of transgender community connectedness (TCC) and gender identity pride, a community- and individual-level resilience factor. I again use the 2016-2018 TransPop survey, this time restricting the sample to transgender adults. There are three key findings: 1) variation in gender identity and socioeconomic status within the transgender community is linked with differences in resilience; 2) therapy is strongly linked to both higher TCC and pride; and 3) childhood bullying is linked to lower gender identity pride as an adult. Building on the work of others who call on researchers to expand their focus from only disparities and negative outcomes (e.g., Colpitts and Gahagan 2016), I argue that TCC and pride are not only valuable as resilience factors, but as measures of transgender

wellbeing, or what may be called “trans joy” or “gender euphoria” (Beischel, Gauvin, and van Anders 2022; shuster and Westbrook 2022).

B. Introduction

Research demonstrates significant health disparities for the transgender population in the United States (Hsieh and shuster 2021; Scheim et al. 2022). Yet there are also calls for research on sexual and gender minority populations to focus on strengths and resilience as opposed to only risks or disparities (Colpitts and Gahagan 2016). Resilience is an important component of the minority stress model, which argues that sexual and gender minority health disparities often result from the stress of being stigmatized (Meyer 2015). In this context, resilience means that transgender individuals and community contain many strengths and resources for maintaining health and wellbeing in spite of prejudicial environments or discriminatory experiences (Meyer 2015); it can mean the ability to withstand distal stressors, such as being misgendered (McLemore 2018), or proximal stressors, such as expecting rejection (Rood et al. 2016).

Broadly speaking, there are two types of resilience: community and individual resilience (Meyer 2015). Community resilience refers to group-level factors, such as social support from friends and partners, transgender community connectedness (TCC), and family acceptance, whereas individual resilience refers to internal resources such as self-worth and gender identity pride or self-acceptance (Matsuno and Israel 2018). Scholars have linked these resilience factors to improved outcomes and the moderation of stressors (Barr, Budge, and Adelson 2016; Bockting et al. 2013; Budge, Adelson, and Howard 2013; Testa et al. 2015). Building on these research findings, Matsuno and Israel (2018) introduced the Transgender Resilience Intervention Model (TRIM) to highlight interventions that promote

these resilience factors. However, as they point out, levels of resilience and access to these resources may vary depending on social location, including by racial and gender identities within the transgender community (Matsuno and Israel 2018:648).

Little research to date has explored the social determinants of resilience. Justifiably, scholars focused primarily on establishing the importance of resilience on moderating mental health outcomes. However, understanding the social determinants of resilience can help counselors, program designers, and researchers better understand the social forces that enhance or hobble resilience. For example, identifying subpopulations within the transgender community that are linked with lower resilience outcomes may provide evidence for interventions targeting that subpopulation. It may also be useful to know whether and which childhood experiences are salient in the development of resilience outcomes. Geographic determinants of resilience are also important to understand as these may also indicate where interventions are needed.

I use the 2016-2018 TransPop survey (Meyer 2021), a national probability sample of transgender adults, to understand the social determinants of two resilience factors. I focus specifically on transgender community connectedness (TCC) and gender identity pride (or self-acceptance) as community and individual resilience factors, respectively. This approach builds on the National Institutes of Health (NIH) SGM health disparities framework by focusing on positive factors such as chosen families, access to community, and self-acceptance (NIH SGM Research Office 2021). Using a national probability sample allows me to 1) estimate averages of these resilience factors for the national adult transgender population and 2) examine the social determinants of these resilience factors. These are valuable contributions to our understanding of transgender resilience as they will provide

insight to how common resilience is among transgender adults and what factors are related to higher or lower resilience. This can help point to vulnerable subpopulations or ways to intervene. In trying to understand the social determinants of resilience, I examine adulthood sociodemographic factors, childhood experiences, and geographic variables that I hypothesize to be related to TCC and pride.

There are two key findings. The first is that variation in gender identity and socioeconomic status within the transgender community is linked with differences in resilience. The evidence demonstrates that transgender men tend to have lower resilience scores on average compared to transgender women (in the case of TCC) and compared to gender nonbinary individuals (in the case of pride). I also find that transgender adults with higher educational attainment and high income tend to report lower average feelings of connectedness to transgender communities. The second key finding is that therapy in childhood and adulthood is strongly linked to both higher TCC and pride, and that childhood bullying is linked to lower pride as an adult. These findings demonstrate population-level evidence for the efficacy of therapeutic interventions and the lasting harms of bullying.

Finally, I argue that TCC and pride are not only valuable because of their utility in reducing the effect of prejudice and discrimination on health and wellbeing. Rather, they should be construed as elements of what may be called “trans joy” or “gender euphoria” (Beischel, Gauvin, and van Anders 2022; shuster and Westbrook 2022). Building on the work of others who call on researchers to expand their focus from only disparities and negative outcomes (Colpitts and Gahagan 2016), I believe that we should expand our definition of health and wellbeing to include these gender euphoric outcomes that are not biomedical in nature and are important in and of themselves. This is a form of social

scientific praxis that orients the researcher toward positive aspects of a stigmatized community.

C. Background

While minority stress research demonstrates the deleterious effects of prejudice and stigma on health outcomes for gender minorities, research also shows the moderating influence of peer support, pride in minority identity, family support, and self-acceptance (Bockting et al. 2013; McLemore 2018). We can discuss this as a form of *resilience* on the part of gender minorities, meaning that in the face of prejudice and stigma certain community, interpersonal, and individual characteristics can attenuate negative effects. Meyer (2015) states that, “*Resilience* refers to the quality of being able to survive and thrive in the face of adversity.” (Meyer 2015:210) He identifies several characteristics of resilience that are relevant to the study at hand, particularly the distinction between community and individual resilience.

Individual resilience refers to characteristics of the individual that help them cope and overcome adversity (Meyer 2015). For example, having higher levels of self-acceptance or pride for one’s gender identity may improve the ability to withstand stressors such as misgendering. However, Meyer (2015) argues if we focus too much on individual resilience, we risk placing the burden of surmounting health challenges on the individual at the expense of ignoring the societal conditions that produced minority stress in the first place. On the other hand, community resilience expands how individuals can access resources that could help them overcome adversity; rather than relying solely on themselves, individuals can rely on community to help them through difficulties (Meyer 2015). Meyer (2015) highlights several levels of community that could foster resilience, including local and regional

sources, and identity-specific communities, including not just the general LGBTQ+ community but communities of transgender women or gender non-binary individuals.

Having a strong network of supportive family and friends, and a strong transgender community in particular, may be helpful for psychological processing and coping. For instance, since misgendering, expecting rejection, and discrimination are common stressors for gender minorities (Bradford et al. 2013; Hendricks and Testa 2012; McLemore 2018), having a community of individuals who share these experiences may improve the individual's ability to cope. They may offer advice, consolation, and validation, thus improving the individual's psychological wellbeing. These community resources and networks may be invaluable to improving the wellbeing and health of transgender people.

Indeed, researchers have linked transgender community connectedness (TCC) to improved wellbeing as measured by life satisfaction, psychological wellbeing, and self-esteem (Barr et al. 2016), and with better mental health outcomes (e.g. depression and anxiety) among “trans female spectrum” individuals, but not “trans male spectrum” individuals (Pflum et al. 2015). Others have found that support from family and friends is more important than TCC for lower levels of depression and anxiety, though support from friends and connection to the transgender community may overlap in important ways for transgender individuals (Puckett et al. 2019).

Gender identity pride or self-acceptance is also an important resilience factor. Qualitative research shows that transgender individuals find self-worth and self-defined gender identity to be sources of resilience (Singh, Hays, and Watson 2011). Among transgender youth, gender identity pride is a resilience factor moderating the effect of internalized transphobia and depression and anxiety (Conn et al. 2023). A longitudinal study

found that transgender identity pride also moderates the relationship between stigma and poor mental health (Valente et al. 2022). Interviews with transgender individuals show that they find joy in their gender identity, they find connection with other individuals in the transgender community, and this connection through marginalized identities actually improved their “self-confidence, body positivity, and sense of peace” (Shuster and Westbrook 2022:12).

However, disparate social locations within the transgender community likely affect access to resilience, including race and ethnicity, socioeconomic status, and gender identity and expression (Matsuno and Israel 2018; Meyer 2015). The present study is motivated in part to better understand these social determinants of individual and community resilience among transgender adults. Thus far, little research has examined the social determinants of resilience. One study based in Florida found that transgender participants who reported higher numbers of people who support them also reported higher levels of resilience as measured by the Brief Resilience Scale (Bush 2021). However, the results were based on a sample of 56 participants, and thus not generalizable to the national transgender population. Another study in Australia (n=169) found that “high income, identifying as heterosexual, and frequent contact with LGBT peers were independently associated with greater resilience scores” (Bariola et al. 2015:2112). These resilience scores were also based on the Brief Resilience Scale, which “assess[es] the ability to bounce back” after stressful events (Smith et al. 2008), thus validating that connection to LGBT community is indeed related to resilience. In this paper, I assess transgender-specific resilience factors (transgender community connectedness and gender identity pride) rather than general resilience.

In this study I am attempting to explicate the social determinants of greater individual and community resilience among transgender adults. Broadly, I explore three sets of correlates: sociodemographic, childhood, and geographic factors. Interventions intended to promote TCC and pride may perform better if we know which subpopulations have lower average levels of resilience, whether interventions are needed in childhood, and whether there are certain places in need of more attention. I examine sociodemographic factors because these may indicate which subpopulations among the transgender community are more or less inclined to have greater resilience. For example, non-White transgender respondents or those with lower socioeconomic status may have lower overall resilience; on the other hand, because of their marginalized position, they may have had to develop more resilience.

I am also interested to understand whether childhood experiences shape adulthood resilience outcomes, and if so, whether there may be interventions that could help. I focus on therapeutic interventions as a tangible predictor of greater connection to a transgender community and gender identity pride. I do this because the minority stress literature is primarily written by psychology and counseling researchers and because youth mental health and gender identity is a major social and public health issue today. Counseling interventions by 18 are critical to examine for gender minority wellbeing. Other childhood experiences may also shape adult transgender resilience outcomes. For example, the degree to which an individual was gender non-conforming as a child and how often they were bullied may impact their adulthood resilience outcomes. Other research shows that gender minority youth disproportionately experience bullying compared to their cisgender peers, and that this bullying is also associated with greater substance use (Reisner et al. 2015).

Individuals who were more gender non-conforming or who were bullied more may have struggled with self-acceptance and felt isolated; on the other hand, it may have pushed some individuals to seek out other transgender friends and come to terms with their gender identity.

Geographic factors are also important to consider in assessing correlates of resilience given the varying social conditions for transgender people across the country. For example, residing in or near communities with a large transgender population may be an important factor for how connected individuals feel to other transgender people and how easily they accept their own gender identity. In general, there are simply more people that live in cities, including gender minorities. Thus, transgender individuals who live in cities or more urban areas may have greater access to transgender communities compared to transgender individuals who live in rural areas. Access to LGBTQ+ specific health centers may also play a role in the development of transgender resilience. Individuals who live closer to one of these clinics would have access to tangible LGBTQ+ related community resources. However, if those clinics primarily catered to LGB individuals, or to individuals impacted by HIV, they may not be relevant for all transgender people. In the next section, I discuss how I operationalize and measure these various hypothesized correlates of transgender resilience.

D. Data and Methods

I employ the restricted dataset of the 2016-2018 TransPop survey (Meyer 2021). The study sampled the US population above age 18 (total $n=1436$), with the specific goal of obtaining a probability sample of transgender respondents ($n=274$), plus a cisgender comparison sample ($n=1162$). The probability sample of transgender adults in the US is a

major boon for researchers studying transgender health, as we can now infer to the general population with much more accuracy and confidence. In this chapter, I focus only on the transgender subsample, using listwise deletion to remove the 5.8% of cases with missing data (n=258 after listwise deletion). I used survey weights to adjust the representativeness of the sample and to make inferences to the national transgender population. Survey participants were eligible if they were over 18, had at least a 6th grade education, and could speak English. Respondents were screened for transgender and cisgender identity to ensure that a large enough sample of transgender people was collected. I was approved to use the restricted TransPop survey data by the Inter-University Consortium for Political and Social Research (ICPSR). Data were analyzed using the secure Virtual Data Enclave (VDE) provided by ICPSR. All results reported here have been vetted and approved for disclosure by ICPSR staff. Certain results have been masked for privacy and confidentiality reasons, such as minimum and maximum values.

1. Dependent Variables

I have two dependent variables (weighted means and standard deviations can be found in Table 1). First, I examine transgender community connectedness, measured on a 1-5 scale (based on the Gender Minority Stress and Resilience measure in Testa et al. 2015). Scores on this outcome variable are averaged across five items, each measured on a 1-5 scale. Each of these items measure the strength of transgender community connection, including statements such as, “I feel a part of a community of people who share my gender identity” (Cronbach’s $\alpha=0.78$, Krueger et al. 2020; see Appendix A for full item descriptions). Second, I constructed gender identity pride by reverse coding the shame-based internalized transphobia measure provided in the TransPop survey (also based on the Gender Minority

Stress and Resilience measure in Testa et al. 2015). Exploratory factor analysis conducted by Bockting et al. (2020) demonstrates that internalized transphobia has four elements, two of which are pride and shame, which are inversely related. As they state, “Pride and Shame are opposing constructs...” (Bockting et al. 2020:23). Thus, reverse-coding the shame-based internalized transphobia measure is likely a valid measure of gender identity pride, or at the least the absence of shame. This was the average of six related measures of internalized transphobia, measured on a 1-5 scale, including statements such as, “I resent my transgender identity” (Cronbach’s $\alpha=0.86$, Krueger et al. 2020; see Appendix A). Thus, my measure of pride is essentially respondents *disagreeing* with these statements. Because these scales were created from the average of multiple items, they contain non-integer values and are thus continuous rather than ordinal. In both dependent variables I use the imputed versions provided by the TransPop survey in order to retain as many cases as possible.

2. Independent Variables

My correlates of resilience fall into three categories: sociodemographic, childhood, and spatial variables (weighted means and standard deviations available in Table 1). I employ a series of sociodemographic variables. I use a linear age term, and it is a continuous variable measuring age over 18 years old. I code race/ethnicity as White, Black, Latino/a/x, and Multirace/Other. In the transgender sample, the survey measured gender identity as transgender men, transgender women, and gender nonbinary, a coding scheme I retain in this paper. Sexual minority status is measured as either heterosexual (=0) or sexual minority (=1), including lesbian, gay, bisexual, and queer. Education is coded as high school or less (=0) or more than high school (=1), which roughly splits the sample in half. I code health insurance status as =1 if they do *not* have health insurance, to assess the effect of not having

health insurance on resilience. I code personal income as =1 if they earn over \$100,000, and =0 if they earn less. This is intended to measure high-income as a potential correlate of resilience (Bariola et al. 2015). I code marital status as =1 if they are in a legal partnership, including marriage, domestic partnership, or civil union, and =0 if not.

I include several variables reflecting childhood experiences. For therapeutic interventions, I create a variable measuring whether the respondent received therapy or counseling at 18 years old or younger, over 18 years old, or never received any therapy or counseling. I constructed this variable from information about whether the respondent has ever received any therapy or counseling, and if so, at what age they first received it. This allows me to assess the effects of childhood therapeutic interventions. I code childhood bullying as whether the respondent was bullied often as a child (=1) or not (=0), where not bullied often could include sometimes, rarely, or never bullied. This is intended to identify the worst cases of bullying and its effects on resilience. I also include a variable measuring how gender non-conforming the respondent was as a child (included in TransPop survey, based on Zucker et al. 2006). Respondents reported masculinity and femininity on a 1-5 scale for various childhood interests and activities and were then scored based on their assigned sex at birth to assess how conforming they were to their assigned sex. For example, if a respondent was assigned female at birth but self-reports highly masculine childhood interests and role models, they would be considered “most gender nonconforming in childhood” (Krueger et al. 2020:33). The original variable was a categorical variable with three categories (>90th percentile; between 50th and 90th percentile; <50th percentile), but I dichotomize this so it measures whether the respondent was in the top decile of gender nonconformity in childhood (=1) or not (=0).

Finally, I include a suite of geographic variables, coded according to the respondent's location using either zip code or state. I use the distance from the nearest LGBT health center measured in miles, which I transformed into 100-mile increments in order to make the regression effect sizes large enough to be meaningful. According to the TransPop user guide, this was calculated based on "geocoded health center data and respondents' zip codes." (Krueger et al. 2020) This approach was developed by Martos, Wilson, and Meyer (2017), using 2015 LGBT health center data. I include the imputed USDA Rural Urban Commuting Area scale, where higher scores represent greater rurality of the respondent's reported residence. Lastly, I use a measure of the percent of transgender adults in a state using data published from the Williams Institute (Herman, Flores, and O'Neill 2022). This is the only state-level measure I employ.

3. Analytic Strategy

I employ multivariate regression with clustered standard errors by state in order to examine what factors are associated with the resilience outcomes. I begin with sociodemographic correlates in Model 1. In Model 2, I add childhood experiences. Finally, in Model 3 I examine geographic variables. I utilize clustered standard errors instead of multilevel models. While both approaches cluster SEs by group (in this case, state), multilevel models are more often used in order to model variation in the outcome variables across the group-level variable. After examining a one-way ANOVA with a random intercept, I found that there was essentially zero variation across states in the outcome variables. Likely this is attributable to the few observations within each group. Because of this, the mixed effects models at times were unable to estimate random effects parameters. Thus, I employ robust clustered SEs instead. The coefficients and p-values are largely

similar between these models, without the added statistical complexity of multilevel models, which are analytically unnecessary as I am not attempting to model variation across states with these data.

E. Results

1. Descriptive Results

Table 1 presents weighted descriptive results for the transgender sample, allowing for inference to the national population of transgender adults. Transgender adults on average report transgender community connectedness and gender identity pride slightly above the midpoint of 3.0 with greater spread for pride (transgender community connectedness $\mu=3.47$, $\sigma=0.75$; gender identity pride $\mu=3.41$, $\sigma=0.92$), suggesting that community and individual resilience in this population skews slightly positive with greater variation for gender identity pride.

I highlight a few descriptive results for the independent variables here. The transgender population skews rather young (age $\mu=33.53$, $\sigma=14.58$). Gender identity is fairly evenly split (transgender men $\mu=0.33$, $\sigma=0.47$; transgender women $\mu=0.37$, $\sigma=0.48$; gender nonbinary $\mu=0.30$, $\sigma=0.46$). Transgender adults are roughly split between having a high school degree or less ($\mu=0.45$, $\sigma=0.50$) and having more than a high school degree ($\mu=0.55$, $\sigma=0.50$), whereas the vast majority make less than \$99,000 a year ($\mu=0.92$, $\sigma=0.27$) compared to those who make more than \$100,000 a year ($\mu=0.08$, $\sigma=0.27$). About 37% of transgender adults received therapy when they were 18 or under ($\mu=0.37$, $\sigma=0.48$), 41% received therapy as adults ($\mu=0.41$, $\sigma=0.49$), while 22% have never received any therapy ($\mu=0.22$, $\sigma=0.42$). More than half the transgender population reported being bullied often as children ($\mu=0.52$,

$\sigma=0.50$). The average level of transgender adults in a state is about 0.5% of the total population ($\mu=0.52$, $\sigma=0.11$).

2. Multivariate Regression

I present the results of the multivariate regression models in Table 2 (transgender community connectedness) and Table 3 (gender identity pride). I assess statistical significance at the 0.10 level given the small sample size. While I include three models, one for each set of variables (sociodemographic, childhood, and geographic), to reduce redundancy, I only discuss the results from Model 3 for both outcomes. The coefficient sizes and statistical significance from Models 1 and 2 are more or less maintained in Model 3 for both outcomes.

Looking first at transgender community connectedness as an outcome (Table 2, Model 3), I find that transgender women tend to report a greater connection to a community of other transgender individuals compared to transgender men, on average ($\beta=0.310$, $p<0.05$), while there is no statistically significant difference between gender nonbinary individuals and transgender men. Given that the outcome variable is measured on a 1-5 scale, a coefficient size of 0.310 reflects approximately 7.8% of the scale, demonstrating both statistical and substantive significance. Interestingly, having more than a high school degree is associated with *less* feelings of transgender community connectedness, on average ($\beta=-0.355$, $p<0.05$). Similarly, transgender individuals who earn over \$100,000 in personal income on average report lower feelings of transgender community connectedness ($\beta=-0.257$, $p<0.05$). I find no significant relationship between transgender community connectedness and age, race/ethnicity, sexual minority identity, legal partnership, or health insurance status.

Therapy, both as a child and as an adult, predicts greater connection to transgender community compared to those who have never received therapy, on average (childhood therapy $\beta=0.395$, $p<0.01$; adulthood therapy $\beta=0.338$, $p<0.05$). The coefficient size for childhood therapy reflects almost 10% of the outcome variable scale, suggesting that it has quite a substantial relationship with transgender community connectedness. I find no significant relationship between transgender community connectedness and being bullied often as a child or with being gender non-conforming. Likewise, I find no significant relationship with any of the geographic variables—distance from an LGBT health center, rural-urban score, or the share of transgender adults in a state. The adjusted R-squared in this model is quite low ($AR^2=0.068$), and in fact decreased after the addition of the geographic variables, suggesting that there is a fair amount of room for further explanation of what explains transgender community connectedness and that these geographic variables do not improve the model fit.

Turning now to transgender pride (Table 3, Model 3), I find that increasing age is associated with greater pride, on average ($\beta=0.011$, $p<0.05$). Gender nonbinary respondents are also more likely to report greater pride compared to transgender men ($\beta=0.321$, $p<0.1$), as are sexual minority identified respondents compared to heterosexual identified respondents, on average ($\beta=0.370$, $p<0.05$). However, I find no statistical difference between transgender women and transgender men in terms of pride. I also find no statistically significant relationship with race/ethnicity, education, income, partnership status, or health insurance status.

Transgender participants who reported receiving therapy, either in childhood or adulthood, also reported greater pride, on average (childhood therapy $\beta=0.531$, $p<0.05$;

adulthood therapy $\beta=0.413$, $p<0.05$). The coefficient for childhood therapy is approximately 13% of the 1-5 scale used in the outcome variable. Transgender adults who were bullied often as children tend to have lower pride, on average ($\beta=-0.367$, $p<0.01$). However, I find no significant relationship with childhood gender non-conformity. Individuals who are farther from an LGBT health center tend to have lower pride, on average ($\beta=-0.028$, $p<0.1$). This coefficient size is substantively not very impactful. The distance has already been transformed to 100-mile increments. Let us assume a hypothetical scenario comparing someone who lives 0 miles from an LGBT health center and someone who lives 500 miles from an LGBT health center. This distance in the transformed variable translates to 5 units, which multiplied by the coefficient of -0.028, yields about -0.14 difference in the pride scale. However, I do not find any evidence that supports a relationship between rural-urban scores or the percent transgender in a state with pride. Again, the adjusted R-squared is rather low ($AR^2=0.084$) and decreased after the addition of the geographic variables.

F. Discussion

My results demonstrate several key patterns. For one, childhood experiences appear to be important predictors of both community and individual resilience, corroborating the expectations of other researchers (Meyer 2015). Therapy in both childhood and adulthood is linked to higher reported community and individual resilience, on average, suggesting that transgender individuals at all ages would likely benefit from mental health interventions. This key finding provides strong population-level evidence for the effectiveness of psychological interventions in childhood and adulthood. Indeed, this result is likely conservative as these were not counseling interventions aimed specifically at promoting resilience, like those described in the TRIM model (Matsuno and Israel 2018). This builds

on prior research that demonstrates improvements in outcomes post-therapy among transgender adults (Budge, Sinnard, and Hoyt 2021).

Transgender adults who were bullied often as children report less gender identity pride, suggesting that childhood bullying can have lasting consequences for individual psychological resilience. It does not appear that bullying negatively impacts transgender community connectedness as an adult, perhaps demonstrating that bullying has larger effects on individual resilience compared to community resilience. Even so, this unfortunate finding highlights the need for continuing anti-bullying interventions for gender diverse youth in schools—in some cases, it can be life or death (Hurley 2024). This finding may also reflect the environment the participant grew up in. For example, research on LGB youth found that those who grew up in stigmatizing environments later had blunted cortisol responses (Hatzenbuehler and McLaughlin 2014). I am unable to discern with these data whether the coefficient from “bullied often” reflect only the effect from being bullied often, or whether there may be an effect from where transgender respondents grew up, as the results from Hatzenbuehler and McLaughlin (2014) suggest among LGB youth. Importantly, childhood gender nonconformity appears to *not* be related to either resilience outcome, suggesting that gender expression as a child is not indicative of better or worse adulthood resilience; instead, external factors such as therapy or bullying appear to be more significant in predicting resilience.

Sociodemographic factors also play a role in resilience outcomes. I find that transgender men report less gender identity pride compared to gender non-binary individuals and they report less connectedness to the transgender community compared to transgender women, holding all else constant. Perhaps the lower average pride of transgender men affects their

connectedness to transgender communities; in other words, having higher internalized shame leads one to be less likely to seek out and connect with other transgender people. Other researchers have found that transgender community connectedness is linked to fewer depression and anxiety symptoms among trans feminine individuals, but not among trans masculine individuals (Pflum et al. 2015). This may point to a need for greater resilience interventions among transgender men.

Bariola et al. (2015) found that heterosexual identifying transgender individuals tended to report greater general resilience scores. However, I find that transgender individuals who identify as heterosexual are linked with less gender identity pride compared to those who identify as a sexual minority (i.e., lesbian, gay, bisexual, queer, etc.). As the authors suggest, identifying as heterosexual may eliminate an added layer of stigma, thus improving the ability to withstand stressors (Bariola et al. 2015); however, it appears to also be linked to less self-acceptance of their own gender identity.

Interestingly, greater educational attainment and high-income earnings are *not* linked with pride but *are* negatively related to transgender community connectedness. This means that transgender individuals with more than a high school education and those who earn more than \$100,000, on average, tend to report less connection to transgender communities. This contrasts somewhat with what Bariola et al. (2015) found—that higher income is associated with greater resilience as measured by the Brief Resilience Scale. However, it is possible that higher income makes it easier to “bounce back from stress” (per the Brief Resilience Scale in Smith et al. 2008), while simultaneously making it less likely to feel connected to a transgender community. This also points to intriguing differences in

predicting community versus individual resilience factors—socioeconomic status appears to have greater salience for community resilience.

There are a couple potential explanations for these findings. One possible explanation for the high-income finding is that there are fewer transgender adults with high socioeconomic status (see Table 1, only 8% of transgender adult earn over \$100,000). This may make it harder to feel connected to a broader community of transgender individuals. It could mean that transgender adults with higher SES have less in common with the average transgender adult. They may also be socially isolated in ways that are not captured by the geographic variables measured here. It is possible that socioeconomic elites among the transgender population are more geographically mobile, and thus less connected to a place or community in general.

Transgender individuals with more than a high school degree make up 55% of the population (see Table 1), thus making it unlikely that a scarcity of other transgender people with this level of educational attainment is the reason for the lower average transgender community connectedness in this subpopulation. Instead, it is possible is that higher educational attainment leads to meeting more accepting people in general, since studies have found that attending college is linked with more tolerant attitudes, at least toward LGB individuals (Budge 2023; Engberg, Hurtado, and Smith 2007; Lambert et al. 2006). Thus, transgender adults with higher education may rely less on networks of other transgender adults for professional or social connections.

Increasing age is linked with greater gender identity pride, suggesting that as transgender individuals progress through the life course they gain greater resilience. I suspect it is unlikely that this is a cohort effect. A cohort effect would imply that transgender individuals

who were born in earlier eras, such as the 1950s, 60s, and 70s, have higher self-acceptance due to commonalities in the era they grew up in. However, attitudes toward LGBTQ+ people were worse in those eras and have only gotten better since (Budge 2023), suggesting that pride should get better with newer cohorts. It is more likely that individuals gain more gender identity pride as they get older and have more time to process, cope, and accept their gender identity. Another possibility is that given the more negative attitudes of earlier eras, older transgender adults may be more predisposed to having higher self-acceptance if they identify as transgender—other adults from those eras who have less self-acceptance may simply never have come out as transgender, thus skewing the sample. Of course, only a longitudinal study would be able to conclusively decide whether this is a life course or cohort effect.

There are several notable null results. I find no evidence that the geographic factors have a relationship with the two resilience outcomes, with the sole exception of a weak relationship between the distance from an LGBT health center and pride. It appears that demographic and biographic characteristics are more salient than spatial context for predicting resilience, at least in these models. There are a few potential reasons this could be. State-level shares of transgender adults may not be relevant for resilience the way that more local communities of transgender people might be. Furthermore, descriptive statistics presented in Table 1 mask interesting variation in the transgender population by state reported in the source data (Herman et al. 2022). While the states with the largest absolute transgender population are those we would expect (e.g., California, Florida, Texas, New York), the states with the highest percent of transgender people are not (e.g., North Carolina [0.87%], Delaware [0.82%], Arizona [0.73%], and Arkansas [0.7%]). These are estimates

based on a patchwork of state data from the Behavioral Risk Factor Surveillance System, but because gender identity data are not consistently or systematically collected by any federal agency, these are among the best estimates of the national transgender population.

The other two geographic variables are intended to capture variation or dimensions of space that state-level shares of the transgender population might miss. For example, rural-urban areas might better measure the characteristics of place that an individual lives in. Surprisingly, I also do not find evidence that this measure is linked to individual or community resilience—I expected that more urban areas, with ostensibly more community resources for transgender people and with more transgender people in a local area, would be linked to greater community connectedness, if not gender identity pride. It is possible that online networks of transgender communities may offer an avenue for individuals living in more rural areas to remain linked to transgender communities. The other geographic variable, distance from an LGBT health center, is intended to measure access to community health resources related to the LGBT community. However, “proximity” to a LGBT health center does not mean that an individual has access to transgender-specific health care or community resources, as these health centers may specialize in HIV/STI care or peer support that are not targeted at all segments of the LGBT community (Martos et al. 2017:12).

More creative geographic variables may be ideal for future researchers to assess how place-based characteristics affect individual and community resilience. It is likely that community resilience will be fostered in hyperlocal spaces, such as bars, events, and even homes. For example, the density of LGBTQ+ specific bars and events that are not exclusively related to gay men could measure the level of queer and transgender activity in a

place. Alternatively, place-based communities may be less relevant than space broadly construed. Online spaces and social media communities may provide as much or even more connection to transgender communities and affirmation of gender identity than place-based communities, including on TikTok, Instagram, Reddit, and Tumblr. I was not able to examine online community engagement as a factor in this research, but future researchers may consider this.

Another limitation of this study is the reliance on cross-sectional data; as gender identity (hopefully) becomes more common in survey research, longitudinal studies will be able to shed light on how resilience develops over the life course. A longitudinal study will be better able to examine how childhood experience influence adult resilience outcomes, the effect of coming out and transitioning, and how changes develop as transgender individuals age, adding to our understanding of transgender elders. We would also be able to document migration patterns among gender minorities, providing much better insight into how geographic mobility influences resilience—or vice versa. A longitudinal study may also be useful for better understanding why transgender men appear to report lower levels of resilience compared to transgender women and gender nonbinary individuals. Pairing this kind of longitudinal study with in-depth qualitative interviews would also improve the researcher's ability to explore transgender men's relationship with TCC and pride.

Program evaluation could also be an appropriate research design in future research if researchers partnered with community-based organizations (CBOs), governmental agencies, or schools to implement programs aimed at promoting transgender communities or gender identity pride (e.g., the TRIM model per Matsuno and Israel 2018). Qualitative research such as interviews, focus groups, and participant observation may be better suited to

understanding how resilience is developed, although survey data may be useful to quantify differences before and after programs. Furthermore, including transgender individuals as part of a research advisory board would enhance the trust in and efficacy of this kind of community-based research.

G. Conclusion

The research presented here offers a glimpse into the state of transgender resilience and its social determinants. In summary, we can understand patterns of transgender community and individual resilience by looking at social, biographic, and geographic correlates. The results do not support a strong relationship between the geographic variables and resilience factors measured in this research, but this may be something that future research continues to explore. However, age, gender identity, and sexual orientation are salient social locations when exploring individual resilience, while gender identity, educational attainment, and income are important for understanding community resilience. Therapy and freedom from bullying are robust correlates with resilience, offering avenues for interventions to promote resilience or mitigate obstacles (Matsuno and Israel 2018).

Current research on transgender resilience is interested in its utility in reducing the effect of prejudice and stigma on health and wellbeing. This is a valuable line of inquiry. However, qualitative research demonstrates that forms of resilience such as transgender pride and feelings of connection to a transgender community may be construed as valuable social outcomes, *per se*; trans and gender diverse communities have themselves come up with the terms “trans joy” and “gender euphoria” to describe these social outcomes (Beischel et al. 2022; shuster and Westbrook 2022). The direction of future sociological and public health research on transgender health should expand on the strides made toward understanding

trans joy and gender euphoria. These qualitative studies are excellent starting points for quantitative social scientists to incorporate into survey work and build generalizable evidence. To paraphrase Shuster and Westbrook (2022), sociology is not necessarily only the study of social inequalities, but the study of society broadly, which includes positive social facts as well. In this line of thought, the sociology of health should be more than *only* measuring health disparities and documenting stigma, discrimination, and poor health outcomes. Sociologists are well-positioned to study social factors that contribute to positive health outcomes, including strengths found in marginalized communities, chosen families, friendships, and other social connections.

Chapter IV References

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Table 1: Descriptive Statistics Table (Weighted, n=258)

Dependent Variables	Mean	SD
Transgender community connectedness (1-5 scale)	3.47	0.75
Gender identity self-acceptance (1-5 scale)	3.41	0.92
Sociodemographic Variables	Mean	SD
Age	33.53	14.58
Race/Ethnicity		
White	0.59	0.49
Black	0.10	0.30
Latino/a/x	0.14	0.34
Multirace/Other	0.17	0.38
Gender Identity		
Transgender man	0.33	0.47
Transgender woman	0.37	0.48
Gender nonbinary	0.30	0.46
Sexual Orientation		
Straight/heterosexual	0.18	0.38
Sexual minority (LGBQ+)	0.82	0.38
Education		
High school degree or less	0.45	0.50
More than a high school degree	0.55	0.50
Income		
Personal income \$99,999 or less	0.92	0.27
Personal income more than \$100,000	0.08	0.27
Partnership Status		
No legal partnership	0.85	0.36
Legal partnership	0.15	0.36
Health Insurance Status		
Has health insurance	0.92	0.27
Does not have health insurance	0.08	0.27
Childhood Experience Variables	Mean	SD
Therapy		
Received therapy 18 or under	0.37	0.48
Received therapy after 18	0.41	0.49
Never received therapy	0.22	0.42
Bullying		
Bullied often as a child	0.52	0.50
Not bullied often as a child	0.48	0.50
Gender Nonconformity		
Not most gender nonconforming as a child	0.85	0.35
Most gender nonconforming as a child	0.15	0.35
Geographic Variables	Mean	SD
Miles away from the nearest LGBT health center (100 miles)	0.60	1.83
Rural-Urban Commuting Area scale	1.95	2.19

Percent transgender in a state	0.52	0.11
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Source: Movement Advancement Project 2017; TransPop 2016-2018

Table 2: OLS regression predicting transgender community connectedness (clustered SEs by state)

	Model 1	Model 2	Model 3
Sociodemographic Variables			
Age	-0.003 (0.003)	-0.002 (0.004)	-0.001 (0.004)
Black (ref=White)	-0.030 (0.221)	0.024 (0.208)	-0.007 (0.213)
Latino/a/x (ref=White)	0.050 (0.163)	0.068 (0.150)	0.070 (0.157)
Multirace/Other (ref=White)	-0.040 (0.136)	-0.034 (0.135)	-0.011 (0.133)
Trans woman (MTF) (ref=Trans man)	0.253* (0.113)	0.328* (0.124)	0.310* (0.127)
Trans GNB (ref=Trans man)	0.143 (0.128)	0.199 (0.129)	0.189 (0.131)
Sexual minority identity (ref=Heterosexual)	-0.072 (0.153)	-0.028 (0.174)	-0.027 (0.185)
More than HS degree (ref=less than HS degree)	-0.321* (0.122)	-0.364** (0.126)	-0.355* (0.133)
Personal Income >\$100,000 (ref=Income <\$100,000)	-0.272* (0.133)	-0.247* (0.094)	-0.257* (0.114)
Legal partnership ((ref=no legal partnership)	-0.182 (0.142)	-0.114 (0.149)	-0.127 (0.150)
No health insurance (ref=has health insurance)	-0.044 (0.182)	-0.001 (0.170)	-0.003 (0.177)
Childhood Experience Variables			
Received therapy by 18 (ref=never received therapy)		0.412** (0.137)	0.395** (0.141)
Received therapy after 18 (ref=never received therapy)		0.363** (0.129)	0.338* (0.133)
Bullied often (ref=not bullied often)		-0.142 (0.104)	-0.138 (0.101)
Most gender non-conforming as a child (ref=not most GNC)		0.038 (0.156)	0.033 (0.168)
Geographic Variables			
Miles away from the nearest LGBT health center (in 100 miles)			-0.033 (0.035)
Rural-Urban Commuting Area (RUCA) Urbanicity score			-0.001 (0.028)
Percent transgender in a state			-0.218 (0.559)
Constant	3.720*** (0.208)	3.364*** (0.245)	3.489*** (0.309)
Observations	258	258	258
R ²	0.085	0.126	0.133
Adjusted R ²	0.044	0.072	0.068
AIC	582.058	578.240	582.164

Source: TransPop 2016-2018; Williams Institute 2022

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3: OLS regression predicting self-acceptance (clustered SEs by state)

	Model 1	Model 2	Model 3
Sociodemographic Variables			
Age	0.010** (0.004)	0.010* (0.005)	0.011* (0.005)
Black (ref=White)	0.029 (0.268)	0.057 (0.220)	0.041 (0.243)
Latino/a/x (ref=White)	0.302 (0.215)	0.336 (0.210)	0.335 (0.206)
Multirace/Other (ref=White)	0.119 (0.202)	0.147 (0.190)	0.170 (0.200)
Trans woman (MTF) (ref=Trans man)	0.034 (0.169)	0.163 (0.142)	0.152 (0.148)
Trans GNB (ref=Trans man)	0.246 (0.156)	0.331* (0.158)	0.321* (0.159)
Sexual minority identity (ref=Heterosexual)	0.233 (0.181)	0.374* (0.185)	0.370* (0.179)
More than HS degree (ref=less than HS degree)	-0.078 (0.120)	-0.084 (0.123)	-0.079 (0.119)
Personal Income >\$100,000 (ref=Income <\$100,000)	-0.107 (0.332)	-0.074 (0.284)	-0.069 (0.276)
Legal partnership ((ref=no legal partnership)	-0.004 (0.179)	0.054 (0.182)	0.044 (0.184)
No health insurance (ref=has health insurance)	-0.402 (0.244)	-0.341 (0.252)	-0.344 (0.250)
Childhood Experience Variables			
Received therapy by 18 (ref=never received therapy)		0.542* (0.228)	0.531* (0.229)
Received therapy after 18 (ref=never received therapy)		0.432* (0.187)	0.413* (0.186)
Bullied often (ref=not bullied often)		-0.370** (0.132)	-0.367** (0.132)
Most gender non-conforming as a child (ref=not most GNC)		0.249 (0.182)	0.252 (0.193)
Geographic Variables			
Miles away from the nearest LGBT health center (in 100 miles)			-0.028+ (0.016)
Rural-Urban Commuting Area (RUCA) Urbanicity score			-0.004 (0.027)
Percent transgender in a state			-0.034 (0.741)
Constant	2.810*** (0.315)	2.363*** (0.340)	2.396*** (0.545)
Observations	258	258	258
R ²	0.072	0.145	0.148
Adjusted R ²	0.030	0.092	0.084
AIC	690.399	677.200	682.199

Source: TransPop 2016-2018; Williams Institute 2022

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Chapter IV Appendix A: Scale Descriptions

Internalized Transphobia (all 1-5 scales, reverse coded for Self-Acceptance/Pride):

- I resent my transgender identity.
- Being transgender makes me feel like a freak.
- Because I am transgender, I feel like an outcast.
- I ask myself why I can't just be normal?
- I feel that being transgender is embarrassing.
- I envy people who are not transgender.

Transgender community connectedness (all 1-5 scales):

- I feel part of a community of people who share my gender identity.
- I feel connected to other people who share my gender identity.
- When interacting with members of the community that shares my gender identity, I feel like I belong.
- I'm not like other people who share my gender identity.
- I feel isolated or separate from other people who share my gender identity.

V. Conclusion

The period during which this dissertation research was conducted and written is characterized by contradictory patterns and social phenomena. The medical and health care landscape is changing in ways that signal both progress and regression. In HIV and other STI care, PrEP and, more recently, Doxy-PEP are promising biomedical interventions (Leutkemeyer 2023), although access and stigma may prevent effective uptake in the most vulnerable communities (Mutchler et al. 2015). Yet, the mpox (formerly known as monkeypox) outbreak in 2022 into 2023 challenged public health officials to counter an epidemic that largely impacted sexual minority men and transgender women. While the eventual roll out of the mpox vaccines curbed the extent of the epidemic, the initially slow response was worrisome. In the health insurance market, some health insurance plans appear to be expanding their definition of medically necessary gender-affirming care to include treatments that were previously considered cosmetic (Gonsalves 2024), but curtailment of access to gender-affirming care in many states thwarts some of these advances.

Societally, more people than ever before are identifying as LGBTQ+, particularly in the youngest generations who are increasingly abandoning fixed or monosexual labels such as “straight” or “gay” in favor of more sexually fluid bisexual and queer sexual identities and nonbinary gender identities (Bridges and Moore 2018; Herman, Flores, and O’Neill 2022). While the adult transgender population is largely stable, estimates suggest youth are increasingly identifying as transgender (Herman et al. 2022). Acceptance for sexual minorities such as gay men and lesbians is at all time high (Budge 2023), and drag queens have more popular culture visibility and support, if the popularity of *RuPaul’s Drag Race* is any indication (Kirkland 2023). There are also more LGBTQ+ politicians than ever before

(LGBTQ+ Victory Institute 2022). All these facts ostensibly point to greater acceptance, visibility, and support than at any point in United States history.

Yet, at the same time, it is also a moment of astounding backlash. There are concerted efforts to quash progress and reverse it as much as possible. While sexual minorities have largely but not entirely escaped the worst of the backlash, transgender and other gender minorities are bearing the brunt of it. 2023 was the worst year on record for anti-transgender legislation (Choi 2024). Transgender people are still murdered, particularly BIPOC transwomen (Human Rights Campaign 2023). States across the country have enacted bans on medical care for transgender youth and participating in sports consistent with their gender identity, among many other discriminatory laws (Movement Advancement Project 2023). School bullying toward transgender and gender diverse youth has become deadly, as the tragic death of Nex Benedict shows us (Hurley 2024).

Given this complex and contradictory social, political, and medical landscape in the United States today, this dissertation set out to better explain sexual and gender minority (SGM) health disparities. Using the National Institutes of Health SGM health disparities framework as a guide (NIH SGM Research Office 2021), I illuminated the social and geographic contours of different societal, community, interpersonal, and individual factors that influence SGM health and resilience. I examine how societal factors like health insurance policies and structural stigma impact HIV outcomes and mental and physical health, and how community and individual factors foster resilience in the face of stigma. Adding to the NIH SGM framework, I explore geographic variation in each of these factors, contributing to our understanding of how space and place affects SGM health and resilience. This dissertation also contributes to research on fundamental cause theory and minority

stress theory (Hatzenbuehler, Phelan, and Link 2013; Meyer 2003, 2015; Phelan and Link 2015). In this final chapter, I first provide a brief summary of the findings of this dissertation, followed by a discussion of the major overarching themes. I end with suggestions for future research that can build on the results of this dissertation.

A. Summary of Findings

Chapter II of this dissertation focuses on health insurance and HIV/AIDS, a virus which disproportionately affects Black and Latinx gay, bisexual, and other men who have sex with men (GBMSM) and transgender women. Despite finding that Medicaid expansion did indeed lead to increased Medicaid coverage, I find no evidence that Medicaid expansion was linked to improved viral suppression or HIV diagnoses among White or Black Americans or GBMSM. I do find a reduction in HIV diagnoses among Latinx Americans, but not enough to close the gap between White and Latinx Americans. In fact, White individuals enjoy higher viral suppression and lower HIV diagnoses compared to Black and Latinx individuals, regardless of whether they live in a Medicaid expansion state. The persistence of these health disparities despite changes in the health insurance landscape leads me to suggest that stigma and racism are operating as fundamental causes of HIV disparities (Hatzenbuehler et al. 2013; Phelan and Link 2015). Stigma around HIV and sexuality influences sexual minority men's decisions to get tested for HIV, particularly for Black GBMSM (Iott et al. 2022). Healthcare provider stigma is another barrier for HIV care (Geter, Herron, and Sutton 2018; Stringer et al. 2016). Expanding health coverage is a first step to improving HIV care; however, health policymakers "must address the social factor itself" in order to overcome the stigma and racism that prevents optimal HIV care (Hatzenbuehler et al. 2013:813).

In Chapter III, I more directly investigate the effects of stigma on health. I find that structural stigma, measured as anti-transgender policies, is linked with worse mental health outcomes for transgender individuals, building upon previous evidence (Du Bois et al. 2018; Price et al. 2023). These results provide evidence of geographic variation in the effects of stigma on mental health for gender minorities. Furthermore, the results provide evidence that there are serious disparities in both physical and mental health outcomes between transgender and cisgender individuals, and even within the transgender community itself. For example, gender nonbinary individuals and transgender women report worse physical and mental health outcomes compared to cisgender men, while transgender men report worse mental health outcomes compared to cisgender men. This study has direct implications for the current social and political debate around transgender rights in the United States. What we cannot infer from these results is whether and how transgender individuals cope and surmount these serious challenges, an inquiry I take up in the next chapter.

In Chapter IV, I explore the social determinants of resilience among transgender adults. I find that variation in gender identity and socioeconomic status within the transgender community is linked with differences in community and individual resilience. I also find that therapy is strongly linked to both higher TCC and pride, whereas childhood bullying is linked to lower gender identity pride as an adult. These results provide promising population-level evidence that therapeutic interventions are effective for promoting resilience (Matsuno and Israel 2018). Building on the work of others who call on researchers to expand their focus from only disparities and negative outcomes (e.g., Colpitts and Gahagan 2016), I also argue that TCC and pride are not only valuable as resilience factors,

but as measures of transgender wellbeing, or what may be called “trans joy” or “gender euphoria” (Beischel, Gauvin, and van Anders 2022; shuster and Westbrook 2022). I now turn to a discussion of the overarching themes of this dissertation.

B. Overarching Themes

An overarching theme of this dissertation is that sexual and gender minorities are a distinct population with distinct health needs. The results contribute to our understanding of the social determinants of SGM population health, wellbeing, and resilience. However, the findings point to several other interrelated themes that are essential to fully understanding SGM population health: geography and social context, stigma, and health disparities and equity. This dissertation illuminates the contours of these three themes throughout.

For example, geography and social context are vitally important to consider when investigating SGM health. In general, I find that where SGM individuals live matters for their health and wellbeing, but it is not deterministic. For example, viral suppression is lower and HIV diagnoses are higher on average in states that did not expand Medicaid. While I do not find evidence that this is because of differences in this health insurance policy, it does not bely the fact that geographic differences in HIV outcomes exist. There may be other factors that contribute to these geographic differences, such as access to LGBTQ+ health clinics that specialize in sexual health and actively combat stigma and prejudice. In other words, places with lower viral suppression and higher HIV diagnoses may be suffering from a lack of LGBTQ+ specific health services. It could be that this is linked to variations in attitudes toward sexual and gender minorities, such that more accepting places are more likely to offer clinics and services for this population, thus contributing to enhanced HIV health. It could also mean that in more accepting places more SGM individuals feel safe

discussing their sexual health, whereas in more stigmatizing places they may be much less likely to do so (Stringer et al. 2016).

Furthermore, while I did not investigate SGM-specific health insurance policies, spatial variation exists here as well (Bakko and Kattari 2021) that almost assuredly contribute to SGM health and wellbeing. In particular, transgender rights are vastly different across states, with some directly inhibiting access to gender-affirming health coverage (Movement Advancement Project 2023). There are also differences across states in how health insurance plans regulate gender affirming treatments and how they determine what is “medically necessary” versus cosmetic (Gonsalves 2024). However, even beyond SGM-specific health policies, there are major differences in rights accorded to LGBTQ+ people across the US (Movement Advancement Project 2023). I investigate the effect of this differential policy regime by exploring how anti-transgender policies affect mental and physical health outcomes. These differences in rights span health, family, employment, housing, and hate crimes, creating formidable legal barriers for SGM in general, and gender minorities in particular, from building a healthy, happy life.

This also highlights the importance of social context in influencing health outcomes. In other words, it is not simply or only the individual’s biology or behavior that determines health—social context, such as neighborhood, city, and even state characteristics including social relationships, cultural and religious factors, and political climate, are all important. The geographic distributions of LGBTQ+ people across the country may also be an important factor shaping SGM health, wellbeing, and resilience. While I do not find that larger shares of transgender people in a state correspond with greater resilience, I believe that further research is needed. We likely need to look more closely than state-level statistics

to understand how distributions of LGBTQ+ people influence health and wellbeing, if at all. As I show in previous work (Budge 2023), larger shares of people identifying as LGB in a state is likely a sign that the place is more accepting, and thus encourages individuals to come out or migrate to that state. While this previous work did not examine transgender identities or attitudes, it is possible that the same mechanism applies to gender minorities; future research, which I discuss in more detail below, should certainly consider this to assess whether and how the mechanism is similar or different to sexual minority attitudes. Finer grained geographic data will be paramount to refining these findings. There are bastions of acceptance within places of prejudice, for example accepting urban areas within states with transphobic policies (e.g., Austin within Texas).

This relationship between SGM health, geography, and social context inevitably requires us to consider a second major theme of this dissertation: stigma. The etiology of sexual and gender minority health disparities leads back to stigma. As others have put it, stigma is a fundamental cause of health disparities (Hatzenbuehler et al. 2013). As evidenced from the empirical findings of this dissertation, stigma is key to understanding how SGM health is shaped. Prior research has demonstrated that there is mistrust, avoidance, and delayed care when it comes to health care due to perceived stigma or the avoidance of situations that may put the individual at risk of stigma (Hsieh and Shuster 2021; Iott et al. 2022). This likely affects the expansion of health coverage and moderates its effects on HIV health, as individuals may be reluctant to seek out care for something that is perceived to be stigmatized. Rectifying the social causes of this is critical to improving the social conditions of SGM health. However, this cannot be only an individual or even organizational effort. As Chapter III demonstrates, political efforts underway across state legislatures to limit

LGBTQ+ rights require diligent resistance even by public health researchers, as structural stigma enacted at this level has clearly deleterious impacts.

At the same time, LGBTQ+ individuals cannot wait for society to change—and this has been the case historically as they have fought for their rights. Resilience in the face of these stigmatizing social circumstances is critical for the maintenance of SGM health and wellbeing. In particular, transgender and nonbinary individuals are the subject of fatal violence and prejudice (Human Rights Campaign 2023), and they require tools for surviving and thriving today. Many of these tools have been pioneered by LGBTQ+ communities themselves. Professional researchers, counselors, and advocates and allies can draw on these community-inspired strengths to better understand how to promote better health and wellbeing.

The third major theme of this dissertation is a focus on health disparities and health equity. This dissertation aims to promote greater health equity for sexual and gender minorities. Each chapter points to different strategies toward that goal. In Chapter II, the results suggest that improving health disparities and achieving health equity will require addressing stigma and racism as fundamental causes of health inequalities. There are clear disparities between White, Black, and Latinx populations with HIV, and GBMSM. Expanding access to LGBTQ+ specific health centers may be a key intervention, with ongoing outreach campaigns to vulnerable populations. This will require a funding commitment and vigilant public health officials and LGBTQ+ advocates working together. Any lapse in the public health network could undo progress—for example, syphilis is making a comeback despite being almost eradicated in the 1990s (CDC 2024).

Mental and physical health disparities among gender minorities are of the utmost concern. In Chapter III, I find significantly worse mental and physical health outcomes among transgender individuals compared to cisgender individuals. This kind of health disparity should be unacceptable to public health researchers and officials. I demonstrate that anti-transgender policies are linked to mental health disparities. Addressing or eliminating some of these anti-transgender policies could go a long way toward achieving equity in mental health. In the meantime, promoting resilience among SGM individuals may be our best tool under social conditions of prejudice and stigma. I take up the social determinants of resilience in Chapter IV, which may be key to improving health equity in this population. Community and individual resilience are key factors among gender minorities for buffering the effects of stigma and minority stress, such as those outlined in Chapter III. Thus, understanding what predicts higher resilience in this population is key for understanding how to better achieve health equity, as higher resilience will likely help achieve health equity.

C. Future Directions for Research

This dissertation offers several opportunities for future research to build on its findings. First, I note that this research includes only a section of the LGBTQ+ population: gay, bisexual, and other men who have sex with men (GBMSM, or sexual minority cisgender men), transgender men, transgender women, and gender nonbinary individuals. However, there are important subpopulations missing from this research that future scholars may wish to focus on. For example, I do not investigate sexual minority cisgender women's health, nor do I explore bisexual health as distinct from monosexual health.

Future research should include more demographic and quantitative research on sexual and gender minority health. The expansion of data collection on SGM populations is key (Schwabish et al. 2023). In particular, more scientific surveys of the transgender population in the US are critical. Without adequate, consistent, and properly collected sexual orientation and gender identity (SOGI) data, researchers will remain unable to reliably measure disparities and progress toward health equity. Importantly, LGBTQ+ communities will remain in the dark about their health and wellbeing. Researchers should use their professional expertise to advocate for the expansion of SOGI data collection. There are some understandable concerns about expanding SOGI data collection in government and administrative surveys (Schilt and Lagos 2017). In general, I argue that public health and health care settings are important administrative sectors to collect SOGI information, as this will help researchers and advocates better understand health disparities. Safe, secure, and private data storage is critical to assure the confidentiality of these SOGI data (Schwabish et al. 2023).

Researchers and advocates will need to continue monitoring the wave of anti-transgender legislation and the effect this has on transgender people. Indeed, the TransPop data I use are now six years old—more recent data are needed to corroborate my findings in today’s landscape. Transgender youth are especially important to measure stress and stigma as they are increasingly targeted by state legislation and are at the heart of American culture wars. The effect of laws and attitudes may be particularly acute among this vulnerable population, who may be less able to cope with the effects of stigma. Future research could also include more qualitative research on the impact of living in states with more

discriminatory laws and attitudes. This may more clearly illuminate the pathways by which these effects of structural stigma “get under the skin.”

Qualitative research is an excellent avenue to also explore transgender resilience. Ethnography and participant observation can help us document and understand how transgender community connectedness and pride is important for transgender wellbeing in the words and actions of transgender individuals themselves. Continued research on health disparities should be paired with research programs to ameliorate them, including by studying resilience. Participant observation may be an excellent research method for understanding new programs that destigmatize HIV while offering services. Indeed, it may even be possible to combine several projects into a community-based program—destigmatizing HIV care in transgender communities, assessing the effect of structural stigma, and exploring resilience processes. LGBTQ+ community centers or health clinics may be ideal partners for researchers. Scholars could develop an ongoing relationship with the communities they study and devise research plans that incorporate community views and desires. This could involve strategic incorporation of community advisory boards from the LGBTQ+ community. The PRIDE study is a good example of an ongoing research study that seeks to both incorporate LGBTQ+ community views and has a plan to disseminate findings back to the community (Lunn et al. 2019). Finally, research should also move to examine “trans joy” as an antidote to the overwhelming focus on negative outcomes for transgender people (shuster and Westbrook 2022).

Given the current landscape for sexual and gender minority health, researchers and advocates will need to continue focusing on social and geographic patterns of stigma and prejudice as they play out across the United States in health care and society. Demographers

and sociologists will need to document the changing demographics of sexual and gender minorities, as new identities emerge or as shifts in identification occur. Geographers of sexual and gender minority populations are critical for better understanding the role of space and place in affecting health and health care. Improving health equity for this population requires interdisciplinary collaboration among social and biomedical scientists and across universities, government, community organizations, and the LGBTQ+ community itself.

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