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The Impact of HIV-Related Stigma on the Racial/Ethnic Disparities Across the HIV Care Continuum among Adults Living with HIV in Florida

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FLORIDA INTERNATIONAL UNIVERSITY

Miami, Florida

THE IMPACT OF HIV-RELATED STIGMA ON THE RACIAL/ETHNIC DISPARITIES ACROSS THE HIV CARE CONTINUUM AMONG ADULTS LIVING WITH HIV IN FLORIDA

A dissertation submitted in partial fulfillment of the
Requirements for the degree of
DOCTOR OF PHILOSOPHY
in
PUBLIC HEALTH
by
Derrick James Forney
2021

To: Dean Tomás R. Guilarte
R.Stempel College of Public Health and Social Work

This dissertation, written by Derrick James Forney, and entitled The Impact of HIV-Related Stigma on the Racial/Ethnic Disparities across the HIV Care Continuum among Adults Living With HIV in Florida, having been approved in respect to style and intellectual content, is referred to you for judgment.

We have read this dissertation and recommend that it be approved.

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Date of Defense: November 9, 2021

The dissertation of Derrick James Forney is approved.

Dean Tomás R. Guilarte
R.Stempel College of Public Health and Social Work

Andrés G. Gil
Vice President for Research and Economic Development
and Dean of the University Graduate School

Florida International University, 2021

DEDICATION

I dedicate this dissertation to my parents

Duane & Carolyn Forney,

to my grandmothers, who passed during this process,

Jessie Mae Price & Ivaleen Francis Forney,

to my brother and sister,

Quin Hicks and Raven Forney,

to my closest friends,

Hernando Flowers, Ryan Norman, Matthew Bolden, Emeka Umachi, Jason Love,

Jonathan Jones, Arielle Golden, Briana Black, Lauren Chapman, and Quentin McDonald

And to my fiancée Esther Mathurin and the Mathurin Family

Thank you for your love, guidance, and support.

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ABSTRACT OF THE DISSERTATION

THE IMPACT OF HIV-RELATED STIGMA ON THE RACIAL/ETHNIC DISPARITIES ACROSS THE HIV CARE CONTINUUM AMONG ADULTS LIVING WITH HIV IN FLORIDA

By

Derrick James Forney

Florida International University, 2021

Miami, Florida

Professor Mariana Sanchez, Major Professor

Background: Florida currently has one of the highest rates of new HIV infections in the U.S. As of 2019, Black and Hispanic HIV-positive individuals in Florida were significantly less likely to receive HIV care, remain in care, and achieve viral suppression than white HIV-positive individuals. Several studies have linked HIV-related stigma to poor outcomes among people living with HIV (PLWH). This study examined the impact of distinct HIV-related stigma subtypes on linkage to care, retention in care, and viral suppression among PLWH in Florida and if these associations differed across race/ethnicity.

Methods: Data from the 2015-2017 Florida Medical Monitoring Project (MMP) and the Enhanced HIV/AIDS Reporting Systems (eHARS) were utilized in the present cross-sectional study. Logistic regression models were used to examine associations between stigma and HIV care continuum outcomes (linkage to care, retention in care, and viral suppression). A weighted sample of 89,889 PLWH was examined (50.0% Blacks, 20.8% Hispanics, and 29.2% whites). Using multiple race/ethnicity x HIV stigma subtype interactions, we examined if race/ethnicity moderated the association between HIV-related stigma subtypes and HIV continuum of care outcomes. Logistic regression models were subsequently stratified by race/ethnicity for each HIV care outcome based on significant interactions.

Results: Findings indicated greater personalized stigma was associated with lower odds of being linked to care, while higher levels of negative self-image stigma and anticipated stigma were associated with a greater likelihood of being linked to care. Higher negative self-image stigma and anticipated stigma were associated with lower odds for retention in care and viral suppression. Conversely, greater personalized stigma was associated with increased odds of being retained in care and virally suppressed. Distinct associations between HIV-related stigma subtypes and HIV care continuum outcomes were evident among Black, White, and Hispanic participants.

Conclusion: Different forms of HIV-related stigma can distinctly impact HIV outcomes across the HIV care continuum and these associations may differ by race/ethnicity. Findings from this study lay the groundwork for a better understanding of the existing racial disparities along the HIV continuum of care. Future research is needed to understand the underlying mechanisms driving these associations.

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ABBREVIATIONS AND ACRONYMS

ACA	Affordable Care Act
AIDS	Acquired Immunodeficiency Syndrome
ART	Antiretroviral Therapy
CDC	Centers for Disease Control and Prevention
eHARS	Enhanced HIV/AIDS Reporting Systems
FDOH	Florida Department of Health
HIV	Human Immunodeficiency Virus
MMP	Medical Monitoring Project
MSM	Men who have sex with Men
NHAS	National HIV/AIDS Strategy
NHSS	National HIV Surveillance System
PLWH	People living with HIV
PrEP	Pre-exposure Prophylaxis
RNA	Ribonucleic Acid

Chapter I: INTRODUCTION

In 2019, Florida held the third-highest rate of HIV infections in the United States, with an incidence rate of 23.9 per 100,000 people (Elflein, 2021). The estimated prevalence of diagnosed and undiagnosed people living with HIV in Florida is 702.1 per 100,000 people, which was fifth behind Washington D.C., New York, Georgia, and Maryland (Centers for Disease Control and Prevention, 2021b). The United States' southeastern region has a disproportionately high HIV prevalence and HIV mortality rate accounting for about 46% of people living with HIV (PLWH) and 47% of HIV-related deaths in the nation (Centers for Disease Control and Prevention, 2019a). Southern states have long been characterized by greater income inequality, poverty, and poorer health outcomes compared to the rest of the United States. People in the region suffer from poorer health outcomes across a variety of condition, including HIV of conditions (Centers for Disease Control and Prevention, 2019a).

The HIV care continuum was created as a framework to track the progression of individuals from diagnosis of HIV to the achievement and maintenance of viral suppression. The HIV care continuum follows a patient from diagnosis to linkage to HIV care, to retention in HIV care, and viral suppression. However, due to social inequities, the HIV care continuum is often interrupted for many people who live with HIV. Disruptions along the HIV care continuum risk transmission of the virus to HIV-negative partners, progression of the disease, and ultimately HIV-related mortality (Bing et al., 2001). People of color living with HIV have significantly lower rates of success at each step along the HIV care continuum (Florida Department of Health, 2021a, 2021b; Morales-Aleman & Sutton, 2014; Swendeman et al., 2006).

HIV-related stigma contributes to many of the interruptions along the HIV care continuum among people living with HIV (PLWH). HIV-related stigma is the practice of marginalizing, discriminating, and biasing PLWH. Mounting research shows HIV-related stigma is an underlying factor to poor linkage to care, retention in care, adherence to antiretroviral therapy (ART), and viral suppression among PLWH. The self-reported ART adherence rate is estimated to be 86% in the U.S., with 20% of those using adherence support services such as ART adherence counseling (Beer et al., 2016). Issues with adherence to ART such as substance abuse and mental health, lead to fewer than two-thirds of PLWH being virally suppressed (Rivera Mindt et al., 2020; Simoni et al., 2012). HIV-Related stigma is one of the pivotal barriers affecting adherence and engagement in care, in part because of fear of disclosure of serostatus (Crepaz et al., 2016; Turan, Hatcher, et al., 2017).

In racial/ethnic minorities such as non-Hispanic Blacks and Hispanic populations, continuous exposure to social and environmental stressors may intensify the stress related to HIV-related stigma. These may include other forms of discrimination, poverty, limited access to care, residing in neighborhoods characterized by high crime and disorder, violence exposure, and mental illness —all of which have been found to impact the disproportionate rates of HIV facing communities of color in the United States (Williams & Williams-Morris, 2000; Franzini et al., 2005; Trepka et al., 2018). Between 2014 and 2018, the rate of new HIV infections in Florida grew among Hispanics by 29.5% and among non-Hispanic whites by 1.6%. However, the rate of new HIV infections among Black populations decreased by 3.8% (Florida Department of Health, 2021c). In 2019, Black and Hispanic people with HIV were significantly less likely to receive HIV care, remain in care, and achieve viral suppression than their white HIV-positive counterparts (Florida Department of Health, 2021a, 2021b, 2021f). Recent research suggests that ART adherence rates differ by race, with adherence rates lowest among non-Hispanic Blacks [65%], and Hispanics [64%], compared to non-Hispanic whites [72%] (Simoni et al., 2012). This closely correlates with a study on HIV-related stigma that suggested non-Hispanic Blacks, and Hispanics experience more HIV-related stigma than non-Hispanic whites (Loutfy et al., 2012). These findings suggest that non-Hispanic Blacks and Hispanics not only experience greater levels of stigma but that those levels of stigma may contribute to the disparities along the HIV care continuum by exacerbating pre-existing social inequities.

This dissertation aims to examine the associations between HIV-related stigma and specific outcomes along the HIV care continuum and investigate whether these associations are moderated by race and ethnicity.

Theoretical perspective

This study is guided by the HIV-related Stigma Framework. This theory builds on Meyer's Minority Stress Theory, which asserts that experiencing minority-related stress leads to a cascade of biological and psychological reactions, contributing to a greater susceptibility for poor health outcomes than people of a non-minority status (Meyer et al., 1995; Sayles et al. 2009; Rao et al., 2012). Researchers have developed the HIV-related Stigma Framework by building on Meyer's minority stress theory (Turan, Hatcher, et al., 2017). This framework consists of three components: Predictors, specifically HIV-related stigma (enacted, community, anticipated, and internalized); mechanisms (interpersonal factors, psychological resources, mental health, and stress processes); and health outcomes, specifically engagement in care (ART adherence, retention in care) and HIV-related health (CD4 count & viral load).

This dissertation highlights that HIV-related stigma appears to have both a biosocial and a psychosocial component. This association may explain health outcomes at the individual level that are influenced by HIV-related stigma, specifically linkage to care, retention in care, and viral load. According to the HIV-related Stigma Framework, several factors can influence HIV-related health behaviors and the health of PLWH, including intersectional stigma and structural stigma. Structural stigma refers to social attitudes, practices, structures, services, and laws that infringe upon minority groups. Intersectional stigma refers to experiences and discrimination and shame on account of holding various minority social statuses or identities associated with health inequalities. For instance, belonging to a racial-ethnic minority group and having a HIV-positive status. Overall, this framework assesses the influences of structural and intersecting stigmas, its impact on HIV-related stigma, engagement in care, and subsequent HIV-related health outcomes.

The proposed study will assess the potential role of HIV-related stigma on linkage to care, retention to care, and viral suppression. We examine the impact of structural and intersectional stigmas by assessing the differences in HIV-related stigma types (Personal Stigma, Anticipated Stigma, and Negative Self-Image) across race and ethnicity along the HIV care continuum. The following aims will be pursued in this dissertation:

Research Aims & Hypotheses

- <u>AIM 1: Examine the association between HIV-related stigma and linkage to care and if these associations differ across race/ethnicity.</u>

  - Hypothesis 1a: Higher levels of HIV stigma will be inversely associated with linkage to care among people living with HIV in Florida.
  - Hypothesis 1b: Race/ethnicity will moderate the association between HIV stigma and linkage to care, whereby the relationship between HIV stigma and linkage to care will be stronger among non-Hispanic Blacks and Hispanics compared to non-Hispanic whites.
- AIM 2: Examine the association between HIV-related stigma and retention in care and if these associations differ across race/ethnicity.
  - Hypothesis 2a: Higher levels of HIV stigma will be inversely associated with retention in care among people living with HIV in Florida.
  - Hypothesis 2b: Race/ethnicity will moderate the association between HIV stigma and retention in care, whereby the relationship between HIV stigma and retention in care will be stronger among non-Hispanic Blacks and Hispanics compared to non-Hispanic whites.
- AIM 3: Examine the association between HIV-related stigma and viral suppression and if these associations differ across race/ethnicity.
  - Hypothesis 3a: Higher levels of HIV stigma will be inversely associated with viral suppression among people living with HIV in Florida.
  - Hypothesis 3b: Race/ethnicity will moderate the association between HIV stigma and viral suppression, whereby the relationship between HIV stigma and viral suppression will be stronger among non-Hispanic Blacks and Hispanics compared to non-Hispanic whites.

Methods

This cross-sectional study utilized data from the 2015-2017 Florida Medical Monitoring Project (MMP). The study is based on an unweighted sample size of (n=771) and a weighted sample size of 89,889 PLWH in Florida. The MMP, funded by the Centers for Disease Control and Prevention, is an annual survey done via structured interviews and medical record abstraction of study participants' clinical and behavioral characteristics across 23 states in the U.S. and Puerto Rico (Centers for Disease Control and Prevention, 2015b). The Florida MMP data consists of PLWH including those receiving and not receiving HIV-related care. It is collected through personal interviews by MMP data collectors at the Florida Department of Health.

The present study uses data collected specifically in the state of Florida and was merged with EHARS data to attain measurements of linkage to care, retention in care, viral load. Participants were eligible for the study if they were living with HIV and ≥ 18 years of age. Three independent variables of interest (personalized stigma, negative self-image, and anticipated stigma) and three dependent variables of interest (linkage to care, retention in treatment, and viral suppression) were chosen in the present study.

All data was analyzed using SAS. Using percentages and frequencies, the characteristics of the sample were stratified by race, ethnicity, and type of HIV-related stigma. In order to compare proportions, Chi-Square tests were performed. To determine if all the independent variables could be included in the adjusted models, we tested for multicollinearity. There were three adjusted binary logistic regression models in which linkage to care, retention in care, and viral suppression were examined as outcomes. Personalized HIV stigma, negative self-image, and anticipated stigma were the predictors of interest. Using the above-mentioned outcomes and predictors, models were adjusted for demographic characteristics and risk factors that were informed by the current literature. In order to be considered statistically significant, α was set to 0.05.

Further, we examined whether race/ethnicity moderated the effects of stigma types. We examined the multiple race/ethnicity x HIV stigma subtype interactions to examine whether differences in HIV outcomes (linkage to care within 30 days of diagnosis, retention in care, and viral suppression) were associated with HIV stigma subtypes and moderated by race/ethnicity. The interactions were deemed statistically significant if the p-values were less than 0.05. We stratified our analysis based on race/ethnicity for each HIV care outcome once the interactions were determined to be significant.

Limitations

The sampling method used to recruit persons through HIV care facilities underrepresent those who have not been linked to or retained in HIV care. The recruiting method limits the sample to those who may have a higher rate of viral suppression, hindering the generalizability to all non-Hispanic Blacks, non-Hispanic whites, Hispanics living with HIV in Florida.

Assumptions

The following assumptions were made: (a) HIV diagnosis date was accurate and valid, and (b) the respondent’s interviews were honest, accurate, and complete.

Operational Definitions

1. Personalized HIV Stigma, also known as enacted stigma, refers to experienced stigma from external people. Enacted stigma was conceptualized in terms of the Personalized Stigma subscale (R. Williams et al., 2020).
2. Negative Self-Image refers to negative feelings and beliefs about oneself for having HIV. The Negative Self-Image subscale was used to conceptualize internalized HIV stigma (R. Williams et al., 2020).
3. Anticipated HIV Stigma refers to beliefs of discrimination, stereotyping, or prejudice from others in the future resulting from an individual's serostatus. Public attitudes regarding HIV and HIV disclosure concerns are conceptualized as Anticipated Stigma (R. Williams et al., 2020).
4. Linkage to care refers to evidence of an HIV laboratory test (HIV viral load or CD4/cells/lL) within 30 days of the HIV diagnosis.
5. Retention in care is defined as documentation of two or more episodes of engagement that occur not more than three months apart during a year.
6. Virally Suppressed was defined as an HIV RNA level < 200 copies per milliliter in the last viral load measurement of a given year.

Summary and Organization of the Remainder of the Study

In this chapter, we discussed the foundation for this dissertation. HIV-related stigma has shown to have a substantial impact on the HIV care continuum. HIV-related stigma is an encompassing term for several HIV stigma types. In this dissertation we will measure the associations of personalized stigma, negative self-image, as well as anticipated stigma on linkage to HIV care, retention in HIV care, and achieving viral suppression using MMP and eHARS data. We also will examine the differences in these associations by race/ethnicity. HIV-related stigma appears to have both a biosocial and psychosocial component responsible for influencing health outcomes, such as linkage to care, retention in treatment, and viral load. This dissertation aims to examine these outcomes in the racially and ethnically diverse population of Florida that has also shown to have a high rate of HIV spread. Examining the impact of HIV stigma on care outcomes in Florida will provide a greater insight into the large racial disparities along the HIV care continuum. The findings from this study may be used to inform state and local government and health officials in their development of culturally relevant HIV stigma interventions.

Chapter 2 will present a review of research on three levels. First, we review the history and current state of HIV and the HIV care continuum in the US and Florida. Second, we highlight the recent literature on HIV-related stigma, and its impact on linkage to care, retention in care, and viral suppression. Finally, we provide a review of the literature regarding the impact of HIV stigma on race and ethnicity, and the racial and ethnic disparities along the HIV care continuum in the US and Florida. In Chapter three, the methodology, the research design, and the procedures will be described. In Chapter 4, the results of the data analysis will be summarized both in text and graphic format. In Chapter 5, the results will be interpreted and discussed within the context of the existing literature and future research directions will be posed.

Chapter II: LITERATURE REVIEW

Introduction

The United States reported a projected 1.2 million people aged 13 and older living with HIV by the end of 2018, including an estimated 161,800 (14%) people who had not been diagnosed (Centers for Disease Control and Prevention, 2021b). While the HIV cases in the United States continued to decrease, the rates in Florida increased by 9.14% between 2013 and 2019 (Florida Department of Health, 2021c). These differences in HIV outcomes between Florida and the national level cannot be explained solely by prevalence alone. They must also be examined from the perspective of health outcomes across the HIV care continuum. The HIV care continuum is a framework that tracks the progress of people living with HIV from the time they are diagnosed until they have reached viral suppression. HIV-related stigma can potentially have a substantial impact on health outcomes along the HIV care continuum.

To the best of the author’s knowledge, this is the first study to examine how distinct types of HIV-related stigma (personalized stigma, negative self-image, and anticipated stigma) coupled with race and ethnicity influence outcomes across the HIV care continuum among PLWH in Florida. Historically, there have been significant disparities in HIV diagnosis and care across race and ethnicity in the U.S. There has also been a continued increase in the rate of HIV in Florida, especially within communities of color. It is anticipated that knowledge gained from the present study can inform the development of culturally appropriate interventions that lead to the reduction and eventual elimination of HIV-related stigma and improved rates of linkage to care, retention in care, and viral suppression among PLWH in Florida across all racial/ethnic groups.

Conceptual Framework

This study is primarily based on two frameworks often used in the study of HIV. The first is the HIV care continuum, which is “a public health model that outlines the steps or stages that people with HIV go through from diagnosis to achieving and maintaining viral suppression” (HIV.gov, 2021). The steps of the HIV care continuum are diagnosis of HIV, linkage to HIV care, retention in HIV care, and viral suppression. The framework is impactful at the population level as it can be used to determine the proportions of PLWH who are at each step of the continuum. This information can also be used to develop interventions to target those who are not progressing to viral suppression. Understanding progression across the HIV continuum of care helps researchers, public health officials, policymakers, and healthcare providers understand the burden HIV has on their community (HIV.gov, 2021).

The second framework used in our study is the HIV-related Stigma Framework. Developed by Turan and colleagues (2017) this framework builds on Meyer’s Minority Stress Theory (Turan, Hatcher, et al., 2017). Meyer’s Minority Stress Theory posits that the experience of stigma-related stress activates a cascade of biological and psychological reactions, leading to an increased susceptibility for negative mental health outcomes such as depression and anxiety (Meyer, 1995; Rao et al., 2012; Sayles et al., 2009). Findings from numerous studies support this theory, linking discrimination, stress, and racism with a negative physiological response and compromised immune function (Hatzenbuehler, 2009; Hatzenbuehler et al., 2013). The HIV-related Stigma Framework highlights the psychosocial and biological mechanisms that explain how HIV-Related Stigma affects engagement in care (measured by linkage to and retention in care in the present study) and viral suppression (measured by viral load in this present study). The HIV-related Stigma Framework explores numerous HIV-related dimensions that exert a substantial influence on HIV-related health behaviors and the health of PLWH at the individual level.

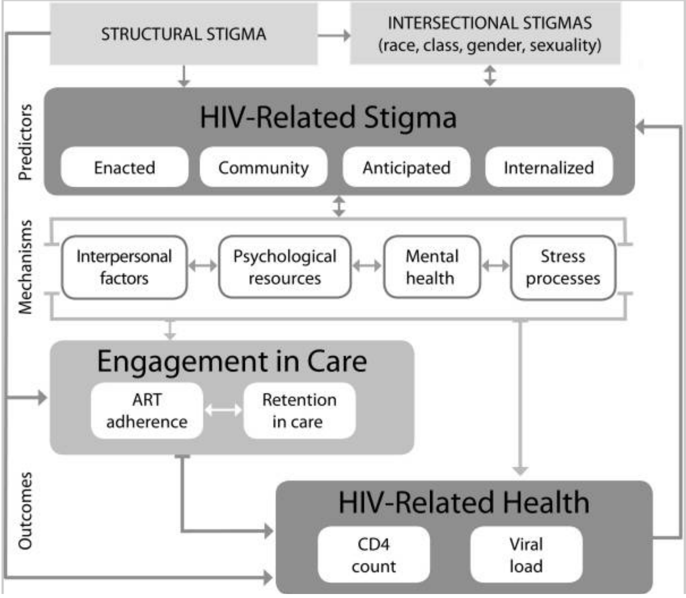

Figure 1. HIV-Related Stigma Framework (Turan et al., 2017)

As depicted in Figure 1, The concept of structural stigma can be described as an attitude within society, practices, structures, services, and legislation that works against minority groups at the macro level. Although, structural stigma may impact health from the macro-level via institutional racism and other inequitable social policies or at the individual level across various intersecting factors including HIV status, race, gender, or sexual orientation. Many theories and frameworks that center around the impact of stigma have neglected to account for the intersectionality of race, gender, sexual orientation, and class as it relates to health-related stigmas. Intersectional Stigma refers to the experiences of discrimination and shame unique to persons holding multiple minority social statuses or identities associated with health inequalities. In the present study, we examine the intersectional stigma of race and HIV-related stigma. This intersectional approach enables the study of

HIV-related stigma experienced among non-Hispanic Black, non-Hispanic white, and Hispanics in Florida to be viewed in the context of cultural background and population-specific experiences of HIV-related stigma.

The HIV-related Stigma Framework begins with structural stigma and intersectional stigma level as predictors, of HIV-related stigma (see Figure 1). The mechanisms in which HIV-related stigma impacts health include interpersonal factors, psychological factors, mental health, and stress process. Using this model, HIV-related stigma is assessed in order to determine its effects on the mechanisms that eventually affect HIV care continuum outcomes. The distinct HIV-related stigma subtypes have been found to be associated with distinct health outcomes (Algarin et al., 2021; Kay et al., 2018; Rice et al., 2017). This dissertation aims to 1) examine the relationship between HIV-related stigma and health outcomes across the HIV care continuum, including linkage to care, retention in care, and viral suppression and 2) the moderating effect race/ethnicity on these associations.

A Brief History of HIV/AIDS in the U.S.

The first cases of acquired immunodeficiency syndrome (AIDS) were reported in the United States in June of 1981. Since the height of the AIDS crisis, over 700,000 people in the U.S. have died from complications related to HIV (Hess et al., 2017; Linley et al., 2018). During the past 40 years, HIV has become a chronic disease due to pharmaceutical innovations, which have enabled people to live a long and healthy life if engaged in consistent care and adhering to antiretroviral therapy. One significant contribution to HIV care was antiretroviral therapy (ART), a daily regimen of HIV medications to treat HIV. Antiretroviral therapy has shown to extend the lifespan of people living with HIV and helped individuals achieve and maintain an undetectable viral load, where they are no longer at risk of transmitting HIV to another person (Centers for Disease Control and Prevention, 2019e). In an effort to establish national indicators for HIV care, the HIV care continuum was developed by an Executive Order by the President in 2013 (White House Office of National AIDS Policy, 2013). The HIV care continuum was established as a public health model that aimed to improve the process of achieving viral suppression. These series of steps followed a patient from diagnosis, linking to HIV care, receiving HIV medical care, retained in care, and finally achieving and maintaining viral suppression (Centers for Disease Control and Prevention, 2019). The present study will specifically focus on three of these steps: linkage to care, retention in care, and viral suppression.

Figure 2. HIV Care Continuum, HIV.gov (https://www.hiv.gov/federal-response/policies-issues/hiv-aids-care-continuum)

The HIV Care Continuum in the U.S.

Diagnosed in the U.S.

The HIV care continuum begins at the time of HIV diagnosis. Guidelines from the CDC recommend that healthcare providers offer an HIV test to everyone between the ages of 13 and 64 at least once to make the test more routine (Branson et al., 2006). The availability of at-home and rapid testing has allowed HIV testing to become more efficient by providing results in approximately thirty minutes (Centers for Disease Control and Prevention, 2015a). In 2018, 1.2 million people were living with HIV/AIDS in the United States (Centers for Disease Control and Prevention, 2021a). Almost 15% of PLWH are unaware of their status, which poses a significant risk to public health as they may inadvertently pass the virus to others. Late diagnosis increases the risk of death due to HIV-related complications (Centers for Disease Control and Prevention, 2020a). In an effort to address this issue, the Joint United Nations Program on HIV/AIDS (UNAIDS) created the “90-90-90 target”. The goal of the 90-90-90 target was to increase the number of individuals aware of their HIV status to 90%. This program also aimed to increase the percentage of PLWH prescribed antiretroviral therapy to 90% and to increase the percentage of PLWH who are virally suppressed to 90% as well (UNAIDS, 2014). The National HIV/AIDS Strategy (NHAS) adopted these goals for the United States in an effort to reduce the spread of HIV (The White House, 2015).

The original Affordable Care Act (ACA) would have made HIV testing a routine part of a universally covered and reimbursable health screening. Medicaid was the most common health insurance program for low-income Americans. With some states choosing not to expand Medicaid coverage, the distribution of financial incentives for HIV testing varies across the United States (Kaiser Family Foundation, 2014). Those states that chose not to expand Medicaid also tend to be among those with the highest rates for HIV infection (Kaiser Family Foundation, 2014; The White House, 2015). The disparities created by this unequal access to HIV testing across the country may prevent undiagnosed PLWH from getting an HIV test and contribute to the virus continued spread, especially among our most at-risk populations.

Linkage to HIV Care in the U.S.

The second step in the HIV care continuum is linkage to care. A patient is considered linked to care if they have visited an HIV health provider within 30 days of a positive HIV test (Centers for Disease Control and Prevention, 2019e). Linkage to care is a critical step in the successful treatment of HIV, as early ART intervention significantly improves HIV quality of life outcomes. A delay in linkage to care is a significant barrier to “treatment as prevention” in reducing the spread of HIV in the U.S. According to the 2020 HIV Surveillance Supplement Report, 80.2% of those diagnosed with HIV in 2018 were linked to HIV medical care within one month and 87.8% within three months. Since 2010, the amount of PLWH linked to care one month and three months after diagnosis has considerably increased year after year (Centers for Disease Control and Prevention, 2014a). The 2021 National Strategic Plan aims to increase linkage to care rates for all PLWH from 77.8% in 2017 to 95% by 2025. A considerable portion of the U.S. efforts will be directed at rapid start programs, providing comprehensive clinical and assistance services, and increasing the level of capacity for HIV-related health care. The rapid start programs will have the most significant impact in linking PLWH to care by initiating treatment within seven days of diagnosis (U.S. Department of Health and Human Services, 2021a).

PLWH experience many barriers in accessing HIV care. Several factors have been identified as predictors of delayed HIV care, including identifying as Black/African American, economic and housing insecurity, lack of health insurance, substance abuse disorders, and mental health disorders (Centers for Disease Control and Prevention, 2014a; Dombrowski et al., 2012, 2015; Torian et al., 2008; Tripathi et al., 2011; Ulett et al., 2009). The current literature on linkage to care also suggests that the site of testing plays a role in linkage to care. Several studies based in New York City have demonstrated that people diagnosed with HIV in places other than a primary care setting, such as STD clinics, correctional facilities, and community testing sites, are far less likely to be linked to care than those identified in primary care settings (Robertson et al., 2015; Xia et al., 2017).

While there is broad agreement that primary care centers are more likely to successfully link PLWH to care, views differ on those diagnosed in emergency departments. In a systematic review of 31 articles assessing linkage to care methods and rates, researchers found that emergency departments that connected newly diagnosed patients to HIV treatment clinics or linked them with an HIV specialist received a higher linkage to care rate. An increased proportion of these programs exceeded the 85% linkage to care goal established by the National HIV/AIDS Strategy (NHAS) (Menon et al., 2016). Indeed, other emergency departments are likely to adopt similar approaches in light of the push for rapid start programs outlined in the 2021 National Strategic Plan (U.S. Department of Health and Human Services, 2021a).

Retention in Care in the U.S.

The third step in the HIV care continuum is retention in care. Retention in care is defined by the CDC as continuous contact between a patient and HIV medical care after initial admission to a health care facility. The CDC calculates this as the percentage of diagnosed persons with HIV who have at least two CD4 or viral load tests performed at least three months apart. However, researchers have found that this measure does not adequately account for missed medical appointments and have begun to suggest that measures of retention in care should also include indicators regarding missed appointments (Mugavero et al., 2013). HIV patients who have sustained care have been shown to have a higher rate of viral suppression and long-term survival. In contrast, patients who only attend part of their scheduled appointments show a higher risk of mortality (Dombrowski et al., 2012).

Among high-income countries, the U.S. has the lowest proportion of PLWH retained in care than any other nation. According to a study conducted by the CDC, only 58% of patients who have been diagnosed with HIV have been retained in care. This figure drops to 49% when those not diagnosed are included (Centers for Disease Control and Prevention, 2019e). It is important to note that some scholars believe these numbers may be inflated as many PLWH might be wrongly classified as not in care because of undocumented changes in their health providers, incarceration, or death (Mugavero et al., 2013). An HIV surveillance project in San Francisco found that more than half of patients who had been labeled as disengaged from care in local records had simply changed providers (Buchacz et al., 2015). A primary objective of the 2021 National Strategic Plan is to increase adherence to HIV treatment and retention in care to achieve and maintain long-term viral suppression. In order to accomplish this goal, the United States plans on developing and implementing evidence-based treatments such as HIV telemedicine, offering convenient pharmacy services, using more community health workers, and peer navigators to increase rates of patient retention in HIV treatment programs. (U.S. Department of Health and Human Services, 2021a).

Past studies have yielded essential insights into the barriers to retention in HIV care. A considerable amount of research has focused on competing life activities, HIV-related stigma, fear of HIV status disclosure, feeling sick, transportation, and insufficient health insurance (Rooks-Peck et al., 2018; Yehia et al., 2015). Previous research has also indicated that the burden of HIV among people with mental illness or symptoms is higher than in the general population and can impact their retention in care. Studies have found that PLWH who simultaneously suffer from depression report sleeping through appointments, feeling apathetic towards their health care, as well as a lack of concern for their own well-being (Yehia et al., 2015). Indeed, the overall evidence among existing studies on mental health and retention in care suggests that mental health services improve retention in care rates (Blashill et al., 2011a; Rooks-Peck et al., 2018).

Viral Suppression in the U.S.

The final step and ultimate goal of the HIV care continuum is viral suppression. The CDC considers a person virally suppressed when their most recent viral load is less than 200 copies per milliliter. Currently, only 66% of individuals living and diagnosed with HIV have successfully achieved suppression (National Center for HIV/AIDS, 2021). These rates drop to 53% when accounting for those who have not been diagnosed (Centers for Disease Control and Prevention, 2019e). Viral suppression is achieved via adherence to antiretroviral therapy (ART). Currently, there is no standard indicator of ART adherence (Centers for Disease Control and Prevention, 2014). Certain factors are associated with lower adherence and viral suppression, including young age, racial/ethnic minority status, lack of health care coverage, homelessness, and incarceration (Beer et al., 2016; Zanoni & Mayer, 2014).

Sustained viral suppression has also been found to vary by health insurance coverage. Approximately 69% of adults with private health insurance coverage have sustained viral suppression. Private health insurance includes those with employer-sponsored and marketplace coverages. Among adults with Medicare, viral suppression rates are 67%. Both of these rates of viral suppression are higher than that of the national average at 66% (Centers for Disease Control and Prevention, 2019e; Dawson & Kates, 2020). Notably, viral suppression rates among Medicaid beneficiaries are not significantly different from that of the uninsured; this finding may reflect the equality-promoting effects of Ryan White's program for the uninsured (Dawson & Kates, 2020).

Under the Ryan White HIV/AIDS Program, underinsured and uninsured individuals living with HIV receive outpatient HIV care, treatment, and support services. Over half of HIV-positive adults received assistance from the program in 2018. At the end of 2019, 88.1% of Ryan White HIV/AIDS Program clients reached viral suppression (DHHS, 2015). It is estimated that without the Ryan White Program, viral suppression among HIV-positive people living without insurance would decrease to 26% (Dawson & Kates, 2020). Nevertheless, for the National HIV/AIDS Strategy to achieve its goal of increasing viral suppression to 95% by 2025, health care coverage among PLWH must be substantially increased.

HIV Disparities in the U.S.

The HIV epidemic has had a disproportionate impact on minorities and other vulnerable populations in the U.S. There were nearly 38,000 new HIV diagnoses in 2018 in the United States (CDC). Of those diagnosed, those who identified as gay or bisexual, represented the highest rates of infection. Disproportionately high infection rates also exist within the Non-Hispanic Black and Hispanic communities compared to their non-Hispanic white counterparts (Centers for Disease Control and Prevention, 2021a). These disparities are primarily due to socioeconomic factors such as lack of access to HIV testing, poverty, discrimination, stigma, homophobia, and language barriers (Centers for Disease Control and Prevention, 2016). There are racial and ethnic disparities in linkage to care, retention in care, and viral suppression. Young people are also less likely to be linked to care, particularly one month after diagnosis. In this chapter, we take a closer look at the HIV disparities in the U.S. and the reasons for their persistence.

Men who have sex with Men (MSM)

Gay and Bisexual men are often collectively referred to as men who have sex with men (MSM) and are the most impacted by the HIV epidemic. They represented approximately 66% of new cases in 2018 but only 2% of the U.S. population (Centers for Disease Control and Prevention, 2020a). Among MSM who are HIV-positive, one-sixth are unaware of their status, making this a serious public health issue. When assessing MSM across the HIV care continuum, 65% have been found to be linked to care, 49% have been retained in care, and 57% are virally suppressed, compared to the overall population rates of 81%, 50%, and 57% respectively (Centers for Disease Control and Prevention, 2020b; HIV.gov, 2021). Several challenges have placed MSM at higher risk for acquiring HIV including, the lack of awareness of HIV status, high-risk sexual behaviors, increased risk for other STDs, as well as stigma, homophobia, and discrimination (Centers for Disease Control and Prevention, 2020b).

The lack of awareness of HIV status is primarily due to the lack of access to universal HIV testing. PLWH who are not aware of their status often do not seek out testing and, in turn, pass the virus along to others (Centers for Disease Control and Prevention, 2020b). Factors such as sexual behaviors put MSM at greater risk due to the increasing trend of condomless anal sex (Centers for Disease Control and Prevention, 2020b). In 2008, the CDC reported MSM condomless sex at 13.7%. By 2014, the amount of MSM condomless sex grew to 15.7% and 24% in 2017 (Centers for Disease Control and Prevention, 2019b; Purcell et al., 2015). In 2018, MSM accounted for 77.6% of primary and secondary syphilis and 37.2% of antimicrobial-resistant gonorrhea, increasing their risk of HIV infection (Centers for Disease Control and Prevention, 2019d). Additionally, pre-exposure prophylaxis (PrEP) is an antiviral drug designed to prevent the spread of the disease among those who have not yet been exposed to HIV. A study conducted by Pasipanodya et al, found that among 372 MSM receiving PrEP daily, greater PrEP adherence was associated with both a higher likelihood of engaging in condomless anal intercourse and a greater number of condomless anal intercourse acts over time (Pasipanodya et al., 2020). Thereby, substantially increase the risk for contracting other sexually transmitted diseases.

Non-Hispanic Blacks and African Americans

Non-Hispanic Blacks have been impacted by HIV more than any other ethnic group in the U.S. According to the CDC, Non-Hispanic Blacks represented 42% of all new HIV infections in 2018. Non-Hispanic Black men accounted for 30% of new HIV infections, while Non-Hispanic Black women made up 11% of all new HIV infections (Centers for Disease Control and Prevention, 2021c). The incidence of HIV in the non-Hispanic Black community has declined by 15% over the last decade, but the trend varies across subgroups. The HIV rates among heterosexual Non-Hispanic Black men decreased by 32%, while rates for Non-Hispanic Black women decreased by 27% (Centers for Disease Control and Prevention, 2021c). However, there are substantially higher incidence rates within the Non-Hispanic Black community among Non-Hispanic Black MSM. Researchers have estimated that one in two Non-Hispanic Black MSM will test positive for HIV in their lifetime (Centers for Disease Control and Prevention, 2020b). Nevertheless, the incidence rate of HIV among Non-Hispanic Black MSM has decreased overall since 2010, with the most significant decline among those 45 to 54 years of age; while that of Non-Hispanic Black MSM between the ages of 24 to 34 have increased by 12% (Centers for Disease Control and Prevention, 2021c).

The Non-Hispanic Black community's experience within the HIV care continuum has been quite bleak. According to the CDC, of the 476,100 Non-Hispanic Blacks diagnosed with HIV, only 61% were linked to care, 47% were retained in care, and only 48% achieved viral suppression, well short of the 90-90-90 target and the 81-50-57 overall national rates (Centers for Disease Control and Prevention, 2021c; HIV.gov, 2021). Notably, one in seven Non-Hispanic Blacks living with HIV are not aware of their HIV status, thereby increasing the potential for further spread of the virus to HIV-negative partners (Centers for Disease Control and Prevention, 2021c). Many factors have influenced the disparities within the HIV care continuum, including knowledge of HIV status, socioeconomic status, increased risk of STDs, racism, stigma, and homophobia (Centers for Disease Control and Prevention, 2021c). Additionally, Non-Hispanic Blacks have historically been subjected to mistreatment and experimentation in the healthcare system, which creates barriers to seeking healthcare (Scharf et al., 2010). Non-Hispanic Black PLWH are also more likely to be impacted by poverty, limiting their access to HIV testing and care services, thereby increasing their risk for HIV as well as other sexually transmitted diseases. Compared to non-Hispanic white women, the rates of chlamydia and gonorrhea among Non-Hispanic Black women are five and seven times greater, respectively. Non-Hispanic Black men also report rates of chlamydia and gonorrhea 6.8 and 8.5 times higher than those of non-Hispanic white men (Centers for Disease Control and Prevention, 2020c). These high rates of sexually transmitted diseases further increase the risk of HIV transmission and infection.

Hispanics/Latinos

The HIV epidemic has also disproportionately burdened Hispanics in comparison to non-Hispanic whites. According to the CDC, Hispanics, represent only 18.5% of the United States population, but represented 27% of new HIV diagnoses in 2018 (Centers for Disease Control and Prevention, 2020d; United States Census Bureau, 2021). The majority of new cases among Hispanics are among MSM, with Hispanic MSM representing 85% of all Hispanic male cases. (Centers for Disease Control and Prevention, 2020d). The primary mode of HIV transmission among Hispanic women is heterosexual contact. The CDC determined that approximately 90% of cases among Hispanic women are a result of heterosexual contact (Centers for Disease Control and Prevention, 2020d). Compared to Hispanic men, Hispanic women are more likely to report low socioeconomic status. This often creates a power differential making negotiating condom usage with their partners difficult, particularly for Latina immigrants (Raj et al., 2004). Acculturation also plays a contradictory role among Hispanics, serving as both a protective and a risk factor (Sanchez, Sheehan, et al., 2019). Acculturation is associated with greater perceived HIV/AIDS risk and increased condom use among

Hispanic/Latino immigrants but is also associated with increased sexual activity and intravenous drug use among in this population (Haderxhanaj et al., 2014; Rojas et al., 2016).

HIV diagnosis within the Hispanic community has remained stable overall since 2014. However, among younger Hispanics (ages 13-25) and older Hispanics (ages 55 and over) there has been an increase in diagnoses primarily among MSM. According to the CDC, one in six Hispanics is unaware of their status. Research suggests that when Hispanic PLWH are assessed along the HIV care continuum, only 61% are linked to care, 49% are retained in care, and only 53% reached viral suppression (Centers for Disease Control and Prevention, 2020d). These disparities along the HIV care continuum result from similar challenges faced by Non-Hispanic Blacks and African Americans, such as being unaware of their HIV status, higher rates of some sexually transmitted diseases, racism, homophobia, and HIV-related stigma. For Hispanics, access to HIV preventive services and treatment is uniquely challenging due to immigration status and language barriers. In addition to ineligibility and fear of deportation that accompany unauthorized immigration status, health care access is also hindered by being undocumented (Pérez-Escamilla et al., 2010). Undocumented Hispanics living with HIV enter care later than their documented counterparts, for instance, and later than non-Hispanic whites and non-Hispanic Blacks (Dang et al., 2016). Once in care, language barriers and a lack of culturally compatible services also make it difficult for Hispanic immigrants to communicate with their health care providers, thus affecting the quality of the health care they receive (Dunlap et al., 2015).

HIV/AIDS in Florida

While the overall rates of HIV are decreasing at the national level, the country's Southeast region continues to have a high HIV incidence rate and HIV mortality rate, accounting for approximately 46% of the population living with HIV and 47% of deaths due to HIV (Centers for Disease Control and Prevention, 2019a). Income inequality, poverty, and poorer health outcomes have long been more widespread in southern states compared to the rest of the nation. Florida has been identified as one of the major centers of new HIV infections in the United States, with Miami, Orlando, and Jacksonville ranking among the top 10 cities for HIV infections (Chang, 2019; Glynn et al., 2019). The burden of HIV has been significantly more impactful on racial minority populations, who are disproportionally affected by social and environmental stressors such as discrimination, poverty, limited access to care, and residing in neighborhoods characterized by crime, violence, and social disorder (Franzini et al., 2005; Trepka et al., 2018; D. R. Williams & Williams-Morris, 2000). These social factors also disrupt PLWH in Florida along the HIV care continuum. Although efforts have been made to reduce the HIV incidence rate in Florida, the impact of these programs has failed to reduce the spread of HIV. The following section will provide important contextual information regarding HIV-related disparities in Florida and the burden of disease across the HIV care continuum in the state.

HIV Disparities in Florida

Florida has one of the most diverse populations in the country. Non-Hispanic Black and African Americans represent approximately 14% of the state's population, while Hispanics represent approximately 23% of the state's population, exceeding the national average. However, there are some distinct differences in the demographics of PLWH in Florida when compared to the nation overall. Compared to the U.S. as a whole, Florida holds a larger proportion of cases transmitted via heterosexual contact (33% vs. 26%) (Florida Department of Health, 2020b), as well as more PLWH over the age of 50 (53% compared with 42%) (Florida Department of Health, 2019c). Researchers suggest these inequalities in diagnosis are often connected to poverty, low education, limited health care access, and other social divisions (Pellowski et al., 2013).

Florida also has a substantial and diverse Hispanic population. Unfortunately, the state also holds the dubious distinction of having the 2nd highest HIV incidence rate and the 2nd highest number of cases of HIV among Hispanics in the country, followed by California (Centers for Disease Control and Prevention, 2021d). According to the Florida Bureau of Vital Statistics, HIV was the 9th leading cause of death among Hispanics ages 25 to 44 in 2019 (Florida Department of Health, 2020a). An estimated 20% of Hispanics living with HIV are unaware of their HIV status. Based on an assessment of Hispanic HIV-positive individuals in Florida across the HIV care continuum, only 74% of Hispanic HIV-positive individuals were linked to care, compared to 78% of Non-Hispanic Whites. According to the latest available statistics, 69% of Hispanics and 72% of non-Hispanic Whites living with HIV were retained in care in 2019. The viral suppression rate for Hispanics living with HIV in Florida was only 67%, compared to 70% for non-Hispanic whites (Florida Department of Health, 2021g, 2021b).

Late diagnosis of HIV can lead to a higher risk of transmission, disease progression, and HIV-related mortality. A study conducted by Sheehan et al. found that within their sample of over 5,000 HIV-positive Hispanics, 26.5% received a late diagnosis, defined as having an AIDS diagnosis within three months of their HIV diagnosis (Sheehan, Trepka, et al., 2017). The study also found that Hispanic males were almost one and half times more likely to receive a late diagnosis compared to Hispanic females. Foreign-born Hispanics had a 22% greater likelihood of late diagnosis than U.S.-born Hispanics. Findings revealed that the most prominent predictor for late diagnosis among Hispanic males was living in neighborhoods of high unemployment (Sheehan, Trepka, et al., 2017).

In addition to HIV-related disparities among Hispanics, The Florida Bureau of Vital Statistics reports that HIV and AIDS are the fifth leading cause of death among Non-Hispanic Blacks (Florida Department of Health, 2020a). According to the Florida Department of Health, 45% of persons living with HIV in Florida in 2019 were Non-Hispanic Black, compared to 29% of Non-Hispanic Whites (Florida Department of Health, 2019b, 2019d). When assessing the rates of Non-Hispanic Black PLWH in Florida across the HIV care continuum, only 73% were linked to care, compared to 78% of non-Hispanic whites. In 2019, 67% of Non-Hispanic Blacks living with HIV were retained in care, compared to 72% of non-Hispanic whites. Viral suppression was only successfully achieved by 58% of Non-Hispanic Blacks living with HIV in Florida, compared to 70% of non-Hispanic whites (Florida Department of Health, 2021g, 2021a).

According to Florida state statistics, 39% of the persons who tested positive for HIV in 2018 were Non-Hispanic Black, with 43% of that sample identifying as MSM (Florida Department of Health, 2018). Approximately 40.0% of the total Caribbean-born population in the U.S. resides in Florida. Approximately 54.1% of the foreign-born Non-Hispanic Black cases of HIV in the United States were from Caribbean countries, primarily Haiti, Jamaica, Trinidad and Tobago, and the Bahamas. While only representing 2% of the population of Florida, immigrants born in Haiti remain at the risk of contracting HIV, accounting for 7% of all HIV cases reported in Florida (Florida Department of Health, 2018). An extensive study conducted by Cyrus et al. of over 39,000 non-Hispanic Black Caribbean immigrants to Florida, revealed that Non-Hispanic Black males born in Jamaica, the Bahamas, and Haiti are more likely to have a delayed diagnosis of HIV (Cyrus et al., 2018). Previous studies have suggested that delayed diagnosis among both Caribbean and U.S.-born Non-Hispanic Blacks may be due to factors such as institutional racism and discrimination, fear of HIV test results, and health inequalities within the United States (Allgood et al., 2015).

The HIV Care Continuum in Florida

Diagnosed in Florida

In 2019, the Florida Department of Health reported that 116,689 people were living with HIV in Florida (Florida Department of Health, 2021c). Approximately 13% of HIV-positive individuals in Florida did not know they were HIV-positive, posing a significant risk to public health (Centers for Disease Control and Prevention, 2019c). Current research indicates that Florida experienced 4,584 new cases of HIV in 2019 (Centers for Disease Control and Prevention, 2019c; Florida Department of Health, 2021a). Seven counties, including Miami-Dade, Broward, Duval, Hillsborough, Orange, Palm Beach, and Pinellas, make up 73% of all diagnosed cases of HIV in Florida. In those same seven counties, 69% of HIV cases progressed to AIDS before receiving an HIV diagnosis (Florida Department of Health, 2016). In 2019, Miami-Dade and Broward counties reported a combined total of 671 AIDS cases, representing 32% of the total for the state (Florida Department of Health, 2021e, 2021d).

Miami-Dade County occupies the southeastern portion of Florida and represents only 13.2% of its population. Yet, Miami-Dade County accounts for 23.7% of the state's total number of HIV-positive persons and leads the nation in new HIV infections each year. In 2015, Miami-Dade County had 26,042 people living with HIV/AIDS, representing 1% of the total population of Miami-Dade County. Miami-Dade County has the highest number of PLWHA in Florida (Centers for Disease Control and Prevention & Health Resources and Services Administration, 2016).

In response to the county’s high rates of HIV, public health officials from local government, academia, and the health sector in Miami formed the Miami-Dade County HIV/AIDS Getting to Zero Task Force to address this pressing public health issue. The Florida Department of Health and the Miami-Dade County Mayor's Office entrusted the Task Force with the goal of ensuring 90% of Miami-Dade County residents living with HIV knew their status by 2020 (Escudero et al., 2019). Among the key recommendations the Task Force developed was the implementation of routine HIV/STI testing in healthcare settings. Since then, Miami-Dade County has implemented universal, routine HIV testing in all adult patients (18 and older), including academics, hospitals, emergency departments, and primary care settings. In 2017, Jackson Memorial Hospital, the top provider of HIV diagnostics in Miami-Dade, oversaw nearly 800 targeted HIV tests annually in the emergency department before implementing routine testing. Notably, the hospital screened approximately 20,000 emergency department patients in the year following the implementation of routine testing (Escudero et al., 2019).

Linkage to HIV Care in Florida

As of 2019, the rate linkage to care in Florida has reached 79% among individuals diagnosed with HIV (Florida Department of Health, 2020b). Several factors may contribute to HIV care along the HIV care continuum, such as HIV testing sites, neighborhood factors, and personal characteristics. A study conducted by Trepka et al. in 2018 found that 18.3% of the 9,000 Floridian study participants did not receive care within three months of HIV diagnosis (Trepka et al., 2018). Most people who tested positive for HIV in clinics in lower-income areas did not initiate treatment within three months of being diagnosed. Testing at HIV case management or HIV counseling centers revealed similar issues with linkage to care for those diagnosed with HIV. Study findings indicated that individuals receiving an HIV diagnosis in a hospital, or an outpatient facility had the highest likelihood of being linked to care, with over 90% of those people initiating care. Further, the study revealed that testing from clinics and blood banks in lower socioeconomic areas resulted in fewer people in these communities being linked to care, thus contributing to the interruption in the continuum of care (Trepka et al., 2018). Indeed, those who are tested at the local blood banks are more likely to be of lower socioeconomic status and uninsured or underinsured, limiting their access to a health care provider (Trepka et al., 2018).

Miami-Dade County, the county with the most significant percentage of people living with HIV in Florida, had only 73% of the PLWH receiving care, lower than the state average of 79% (Florida Department of Health, 2021e). While 15.5% of Hispanics and 26% of Non-Hispanic Blacks living with HIV in Miami-Dade County were not linked to care, these rates were only slightly better than the state averages of 26% and

27% respectively (Florida Department of Health, 2021a, 2021b; Sullivan PS et al., 2020). Miami-Dade County has made strides to improve linkage to care by including rapid start programs recommended in the 2021 National Strategy. An intervention study of 41 newly diagnosed patients conducted by Rodriguez et al, implented an immediate HIV treatment program titled the Treatment and Response Treatment Program (TRRT). One of the aims of the TRRT program is to link those newly diagnosed with HIV to same-day treatment and care as quickly as possible, preferably within the first week of diagnosis. In this study, 91% of participants were linked to care and began ART, similar to other studies that also utilized a linkage navigator (Rodriguez et al., 2019). Indeed, while various factors have been associated with linkage to care among PLWH in Florida, far less is known about how HIV-related stigma impacts linkage to care and how this may differ across race/ethnicity in this population.

Retention in Care in Florida

In 2019, Florida's retention in HIV care rate reached 72% among those living with HIV (Florida Department of Health, 2020b). Similar to that of the national rates, recent research has shown the racial disparities in HIV care retention across the state. A 2017 study of 65,735 cases from a diverse sample of Florida HIV surveillance records, found that Non-Hispanic Blacks were nearly 30% more likely to not be retained in care than non-Hispanic whites (Sheehan, Fennie, et al., 2017). The study corroborates the Florida Department of Health statistics, which found that among PLWH who are out of care, 49% are Non-Hispanic Black, and 24% were Hispanic compared to 25% of non-Hispanic whites (Florida Department of Health, 2020a). A study conducted by Cyrus et al. found that Caribbean-born Non-Hispanic Blacks in Florida were less likely to be retained in care than US-born Non-Hispanic Blacks, Hispanics, and Non-Hispanic Whites. The study suggests the disparity in retention in care may not fully be accounted for by race, but other cultural, socioeconomic, and immigration considerations (Cyrus et al., 2017). In South Florida, the majority of Non-Hispanic Blacks living with HIV originated from Haiti, whereas the Hispanics living with HIV are mostly from Cuba. Notably, due to differences in immigration policies, Cuban immigrants benefitted from social services and health care that were not available to Haitians. (Cyrus et al., 2017; Migration Policy Institute, 2020; Sheehan et al., 2015).

Over the past 5 years, the state of Florida has implemented several approaches in line with the National HIV/AIDS Strategy for the United States that aims to increase access to care and improve health outcomes for people living with HIV/AIDS (Florida Department of Health, 2016). In order to achieve this goal, Florida has developed an approach that included reducing barriers to linkage to care and increasing rates of retention in care. The State of Florida’s approach consisted of the following:

> "1) Assessing risk and protective factors to keeping PLWHs retained in/engaged in care. 2) Improving social media and marketing efforts to address the stigma associated with health care and explaining the benefits of beginning medical care immediately after diagnosis. 3) Promoting the HIV/AIDS hotline as an informational resource for PLWHs seeking entry or re-entry into medical care. 4) Expanding health care access points by working with community health centers and federally qualified health centers to identify new HIV medical care providers. 5) Examining ways to streamline processes at the state and local level that pose barriers to linkage to and retention in care. 6) Providing training and resources to

> private medical providers on how to link newly (Florida Department of Health, 2016)."

The implementation of this approach has yielded limited improvements with retention rates in Florida increasing by only 2% from 2017 to 2019 (Florida Department of Health, 2020b). As such, there remains a critical need for the development of effective approaches that target the most vulnerable populations in Florida. There is previous evidence linking HIV-related stigma and the retention in care among PLWH in Florida. However, little is known about the impacts of distinct HIV-related stigma subtypes on retention in care and whether these associations may differ across race/ethnicity.

Viral Suppression in Florida

Viral suppression is the final step in the HIV care continuum. In the State of Florida, only 68% of those diagnosed with HIV achieved viral suppression in 2019 (Florida Department of Health, 2020b). Although the linkage and retention in care rates have remained relatively stable between 2017 and 2019, the viral suppression rates have improved by 5% within the same time span (Florida Department of Health, 2020b). Of particular concern, however, is that the racial disparities in viral suppression in Florida continue to widen. Only 62% of Non-Hispanic Black people diagnosed with HIV in Florida successfully achieved viral suppression compared to 76% of non-Hispanic whites in 2019 (Florida Department of Health, 2021f, 2021a). This is consistent with a 2017 study that found Non-Hispanic Black people living with HIV in Florida were at increased odds of nonviral suppression (AOR 1.55, 95% CI 1.48–1.63) compared to non-Hispanic whites (Sheehan, Fennie, et al., 2017). Cyrus et al. also found that Caribbean-born Non-Hispanic Blacks in Florida were less likely to reach viral suppression than US-born Non-

Hispanic Blacks, Hispanics, and Non-Hispanic Whites (Cyrus et al., 2017). With regard to the Florida Hispanic population living with HIV, only 70% yield success rates for viral suppression (compared to 76% of non-Hispanic whites) (Florida Department of Health, 2021b). Florida has a strong racial and ethnic diversity, but there are still disparities between groups when it comes to viral suppression (Cyrus et al., 2017; Sheehan, Fennie, et al., 2017). Florida must establish targeted strategies to address the increasing breaks along the HIV care continuum and identify the underlying causes. Hence it is important for more significant examination to be conducted concerning how stigma might particularly impact HIV outcomes among vulnerable populations including racial/ethnic minorities.

HIV-Related Stigma

Over the years, a considerable amount of research on HIV-related stigma has been built on the foundation developed by Erving Goffman. Goffman first conceptualized stigma as a “situation of the individual disqualified from full social acceptance” (Goffman, 1968). HIV-related stigma refers to the prejudice, discounting, discrediting, and discrimination directed toward people living with HIV (Hereck et al., 1998). HIV-related stigma has been a critical issue since the inception of the AIDS epidemic in the 1980s. Indeed, much of the analysis of stigma and public health was developed because of the AIDS epidemic. In March 1983, the Center for Disease Control and Prevention (CDC) reported that four high-risk groups were likely to pose a threat to those who originally believed were not at risk for HIV infection (Fouron, 2013). "The Four H's" (homosexuals, heroin addicts, hemophiliacs, and Haitians) became a stigmatizing phrase describing the four populations most at risk during the AIDS epidemic (Marc et al., 2010). The stigmatization of these groups brought about enormous adverse social consequences. Homosexual men experienced immense amounts of social isolation and stigmatization due to the impact HIV had on this population at the start of the epidemic as well as the ill-informed notion that they brought the virus onto themselves. In discussing the social hardships brought about the HIV/AIDS-related stigma Bayer (2008) states "AIDS-related stigma is a problem for all of society. It imposes severe hardships on the people who are its targets, and it ultimately interferes with treating and preventing HIV infection" (Bayer, 2008).

The impact of HIV-related stigma has been undeniable, putting PLWH into hiding and refusing to be tested to avoid the stigmatization associated with the disease (Bayer, 2008). In his 1999 article, Herek wrote,

> "The widespread expectations of stigma, combined with actual experiences with prejudices and discrimination, exert a considerable impact on [people with HIV], their loved ones, and caregivers. It affects many of the choices [they] make about being tested and seeking assistance for their physical, psychological and social needs…Fearing rejection and mistreatment…[keeping] their seropositive status secret" (Herek, 1999).

Although the advancement in treatment programs for HIV has dramatically improved the quality of life for patients, the weight of an HIV diagnosis carries substantial social impact and stigmatization. PLWH, especially youth, are at very high risk for internalizing HIV-related stigma and feelings of shame and avoidance of coping strategies (Bennett et al., 2016). These negative feelings about themselves contribute to the disproportionate rate of depression among PLWH compared to the general population as well as impacting HIV outcomes (Algarin et al., 2021; Pearson et al., 2021).

HIV Related Stigma Types

Recent studies conceptualized HIV-related stigma as consisting of distinct types including internalized, anticipated, and enacted stigmas, as well as combinations of these types. Anticipated stigma refers to beliefs of experiencing future discrimination, stereotyping, or prejudice from others resulting from an individual’s serostatus (Earnshaw et al., 2013). Anticipated stigma has been associated with delays in HIV testing (Gamarel et al., 2018; Golub & Gamarel, 2013). Enacted stigma refers to previous experiences with discrimination, stereotyping, or prejudice from others (Earnshaw et al., 2013). Enacted stigma has been associated with symptoms of depression and anxiety and has shown interruptions along the HIV care continuum (Algarin et al., 2020, 2021). Internalized stigma refers to negative feelings and beliefs about one’s own HIV-positive status (Earnshaw et al., 2013). Internalized stigma has been associated with lack of condom use, HIV testing, and ART nonadherence (Radcliffe et al., 2010; Smit et al., 2012). Given that specific types of stigmas can have distinct impacts HIV health outcomes, an examination of their unique influences across the HIV care continuum in states highly affected by HIV is essential. Notably, the role that race/ethnicity may play in this association is also imperative.

HIV Related Stigma and HIV Care Continuum

HIV Related Stigma and Linkage to Care

The linkage of PLWH to health care services within one month of their HIV diagnosis is essential for successful HIV care. However, the impact that HIV stigma plays in linkage to care merits more research attention. A study of 64 participants in South Africa conducted by Maughan-Brown et al. found that linkage to care was positively associated with willingness to disclose HIV status. However, linkage to care was negatively associated with internalized stigma (Maughan-Brown et al., 2019). Additionally, researchers from 14 clinical care sites in 2015 investigated 132 geographically diverse, young, non-Hispanic Black, bisexual, and other MSM and found that negative self-image was inversely related to the likelihood of seeking treatment after diagnosis. Another study conducted in 2015 found that negative self-image has been inversely associated with seeking care after diagnosis (Hussen et al., 2015). Prior studies have similarly observed that HIV stigma acts as a barrier to timely linkage to care (Fortenberry et al., 2012). However, since linkage to care is a critical component of the HIV care continuum, more research is necessary to examine its association with HIV stigma, particularly among vulnerable and high-risk populations. An essential aspect of this dissertation is to address the limited amount of research examining the relationship between distinct aspects of HIV stigma types and linkage to care in Florida and the influence of race/ethnicity on that association.

HIV Related Stigma and Retention in Care

HIV-related stigma has had a significant impact on retention in care of many PLWH. Healthcare providers have played a remarkably valuable role in the fight against the spread of HIV. However, recent studies have found that health providers may potentially be a source of HIV stigma towards many people seeking care. There is limited research investigating the attitudes, beliefs, and behaviors of HIV stigma among healthcare providers. A 2017 grounded theory study of 27 healthcare workers found that

HIV-related stigma may be rooted in historically derogatory representation of HIV and power inequalities (Davtyan et al., 2017). The article states that HIV-related stigma can be triggered by fear, poor clinical training, and limited exposure to PLWH. Prior studies confirm similar reports from PLWH experiencing stigmatizing behaviors, attitudes, or beliefs tended to differ by gender, religion, and category of provider. HIV stigma among health care providers have been found to be particularly present among non-Hispanic white male providers who had not received HIV stigma training in the last 12 months (Fredericksen et al., 2015; Stringer et al., 2016). Previous studies have shown that over one-quarter of PLWH report feeling stigmatized within healthcare settings, including discriminatory measures, denial of services, and treatment refusal, as well as reports of physicians refusing to touch or examine the patient (Lindau et al., 2006; Schuster et al., 2005; Wingood et al., 2007). The previously mentioned study conducted by Hussan et al. found that negative self-image was inversely associated with retention in care (OR=0.95; 95% CI 0.91–0.99) (Hussen et al., 2015). This study highlights that those experiencing negative self-image had a higher likelihood of having a missed appointment in the last three months. Overall, there remains a limited research base focused on understanding how distinct HIV-related stigma types may impact retention in care, as well as how race/ethnicity influences those associations. The present study addresses these questions in a diverse and representative sample of PLWH in Florida.

HIV Related Stigma and Viral Suppression

Much of the recent literature has assessed direct negative associations between stigma and viral suppression via decreased medication adherence (Rintamaki et al., 2006; Rueda et al., 2016; Vanable et al., 2006). Researchers have shown that every HIV-stigma type has an inverse association with viral suppression. In a sample of 236 PLWH in Atlanta, Diiorio et al. found that the association between perceived stigma and ART adherence was mediated by self-efficacy. Specifically, perceived stigma eroded one's confidence about adhering to a treatment regimen, which in turn undermined viral suppression (DiIorio et al., 2009). In a study conducted by Stirratt al., of 215 HIV-positive patients who demonstrated poor adherence, researchers found that greater levels of HIV disclosure had a statistically significant association with ART adherence (Stirratt et al., 2006). Rao et al. concluded that internalized stigma may worsen symptoms of depression, such as fatigue and difficulties concentrating, which in turn could compromise one's ability to adhere to a complex treatment regimen and thus fail to achieve viral suppression(Rao et al., 2012). Little is known about the impact of HIV-related stigma on viral suppression among racial/ethnic minorities. A 2018 study on this mechanism among HIV-positive African American women found that HIV-related stigma was not only prevalent in this population, but those who experience higher levels of stigma are less likely to be virally suppressed (Lipira et al., 2019). Nevertheless, no studies to date have examined the impact of distinct HIV-related stigma types on viral suppression, and if these associations differ by race and ethnicity in Florida.

Racial Disparities in HIV-Related Stigma Experiences and its Impact Across the HIV Care Continuum

The concept of intersectionality is often used to assess HIV stigma, specifically with marginalized groups. Intersectionality is the analytical framework that assesses the overlapping social identities that impact an individual's experiences of inequality. HIV-related stigma is a social construct that is highly influenced by demographic identities.

Logie and colleagues assessed the importance of intersectionality in HIV-related stigma, examining HIV-related stigma across Hispanic ethnicity, as well as Asian, African, and Non-Hispanic Black identities (C. Logie et al., 2013; C. H. Logie et al., 2018; Loutfy et al., 2012). Specifically, Loufty et al. conducted a study (n=1026) to assess the differences in reported HIV-related stigma experiences across race and ethnicity. Non-Hispanic Black participants reported the highest rates of HIV-related stigma, followed by Hispanics, while Non-Hispanic White participants reported the lowest total stigma. In multivariate analysis, the interaction of gender and ethnicity was also highly significant: Non-Hispanic Black women and Asian/Latin-American/Unspecified men reported the highest stigma scores among persons living with HIV (Loutfy et al., 2012). These studies suggest increased levels of HIV-related stigma among people of color.

Racial and ethnic disparities in the HIV care continuum have been well-documented. Reducing these disparities has been a critical aim of the United States National HIV/AIDS Strategy. Despite the increase in persons in HIV care, today, there are fewer African Americans compared to non-Hispanic Whites that have achieved viral suppression. (Crepaz et al., 2018). The CDC indicates that African Americans may be less likely to maintain viral suppression and more likely to experience viral loads greater than 1,500 HIV RNA copies—a level that increases the risk for transmitting the virus (Crepaz et al., 2016, 2020).

Swendeman et al. (2006) found that 89% of young people living with HIV reported experiencing perceived stigma. African Americans reported higher levels of social rejection and overall perceived stigma compared to non-Hispanic whites and Hispanics (Swendeman et al., 2006). These results suggest that viral suppression may be more difficult among Non-Hispanic Blacks due to the more significant experience of stigma-related stress activating biological and psychological processes and socioeconomic conditions that lead to a decrease in linkage to care, retention in care, adherence to antiretroviral therapy, and viral suppression. A study of young non-Hispanic Black MSM, found that negative self-image was associated with not seeking care after HIV diagnosis and not maintaining medical appointments (Hussen et al., 2015). However, the study also found that ethnic identity affirmation and HIV-positive identity salience were positively associated with maintaining HIV care appointments. As such, the investigators concluded that ethnic identity may be an essential factor in the mental health of minority MSM living with HIV, and that mental health and primary care providers should aim to be culturally competent and work together to affirm the needs of this population. Likewise, healthcare providers must address issues related to negative self-perception associated with HIV stigma and examine changes in how patients perceive their HIV status overtime.

It should also be noted that a study of Ryan White HIV/AIDS Program patients between 2010 to 2016 found that the historical gaps in viral suppression by race, ethnicity, and gender showed signs of closing in the United States (Mandsager et al., 2018). Nonetheless, according to the National HIV Surveillance System (NHSS) data, fewer Non-Hispanic Blacks are consistently retained in HIV care compared to other racial groups, and Non-Hispanic Black males are shown to be less likely to remain in treatment compared to Non-Hispanic Black females (Centers for Disease Control and Prevention, 2021b). A cohort study conducted by Nance et al. (2018) analyzed 31,930 HIV-positive patients across eight clinics in the United States. The researchers found that viral suppression among participants increased from 32% in 1997 to 86% in 2015 (Nance et al., 2018). However, African Americans had higher odds of presenting with a detectable viral load (OR = 1.68 [CI, 1.57 to 1.80]). Viral suppression was also 8% lower among African Americans than non-Hispanic whites (Nance et al., 2018). Similarly, in a sample of 1809 HIV-positive adults, Simoni and colleagues (2012) found, that African Americans had significantly lower ART adherence compared to Hispanics [odds ratios (OR) = 0.72, P= 0.04] and non-Hispanic whites (OR = 0.60, P<0.001) (Simoni et al., 2012).

Chapter Summary

According to the current literature on HIV-related stigma and the HIV care continuum, specific HIV stigma types have a variety of impacts on HIV outcomes. In addition, the literature in this chapter addressed disparities between Non-Hispanic Black, Hispanic, and non-Hispanic white PLWH in Florida and the United States. Studies have shown that following an HIV diagnosis, people with negative perceptions of themselves are less likely to seek medical treatment. Further, there is evidence that HIV-related stigma may reduce the confidence of individuals with HIV to adhere to a treatment regimen, which, in turn, undermines the ability to remain in care and achieve viral suppression. HIV care continuum disparities among Non-Hispanic Blacks, Hispanics, and non-Hispanic whites continue to be increasingly problematic due in part to the stigma surrounding HIV infection and the lack of access to healthcare. The literature suggests that HIV-related stigma is greater among Non-Hispanic Black and Hispanic PLWH as compared to non-Hispanic white individuals. Several studies have been conducted examining personal stigma, negative self-image, and anticipated stigma on HIV care outcomes. Still, no study has determined the impact of these distinct forms of stigma in a racially and ethnically diverse representative sample PLWH in Florida, a state that continues to yield disturbingly high rates of HIV incidence and mortality. This study fills a gap in the literature by providing a comprehensive analysis of the potential impacts of HIV-related stigma types on HIV care continuum outcomes and how they may differ based on race/ ethnicity among PLWH in Florida.

The findings from this study could aid in the development of culturally tailored interventions to decrease the stigma surrounding HIV in communities of color, as well as inform integrative psychotherapy and HIV treatment approaches that address the high prevalence of HIV-related stigma among marginalized populations.

Chapter III: METHODOLOGY

The overarching aim of the present study was to examine the associations between distinct types of HIV stigma and various outcomes across the HIV continuum of care, specifically, linkage to care, retention in care, and viral suppression. Furthermore, we examined whether these associations differed based by race/ethnicity. The investigation was conducted using a cross-sectional study design. There were three independent variables (personalized stigma, negative self-image, and anticipated stigma) and three dependent variables (linkage to care, retention in care, and viral suppression). The following research aims and hypotheses were pursued:

Aims & Hypothesis

- AIM 1: Examine the association between HIV-related stigma and linkage to care and if these associations differ across race/ethnicity.

  Hypothesis 1a: Higher levels of HIV stigma will be inversely associated with linkage to care among people living with HIV in Florida.

  Hypothesis 1b: Race/ethnicity will moderate the association between HIV stigma and linkage to care, whereby the relationship between HIV stigma and linkage to care will be stronger among non-Hispanic Blacks and Hispanics compared to non-Hispanic whites.

- AIM 2: Examine the association between HIV-related stigma and retention in care and if these associations differ across race/ethnicity.

  Hypothesis 2a: Higher levels of HIV stigma will be inversely associated with retention in care among people living with HIV in Florida.

Hypothesis 2b: Race/ethnicity will moderate the association between HIV stigma and retention in care, whereby the relationship between HIV stigma and retention in care will be stronger among non-Hispanic Blacks and Hispanics compared to non-Hispanic whites.

- AIM 3: Examine the association between HIV-related stigma and viral suppression and if these associations differ across race/ethnicity.

  Hypothesis 3a: Higher levels of HIV stigma will be inversely associated with viral suppression among people living with HIV in Florida.

  Hypothesis 3b: Race/ethnicity will moderate the association between HIV stigma and viral suppression, whereby the relationship between HIV stigma and viral suppression will be stronger among non-Hispanic Blacks and Hispanics than non-Hispanic whites.

Study Design

This study conducted secondary data analysis on data extracted from the 2015-2017 Florida Medical Monitoring Project (MMP) and the Florida Department of Health Enhanced HIV/AIDS Reporting Systems (eHARS). The MMP is a CDC-funded project that monitors clinical and behavioral characteristics of HIV-infected adults receiving medical care in the United States (Centers for Disease Control and Prevention, 2015). The MMP uses a two-stage sampling design to develop annual representative estimates of the sociodemographic, behavioral, and clinical characteristics of people living with HIV in the United States (Beer et al., 2019). This survey was developed so that participating project areas can produce annual representative estimates of these characteristics among all PLWH in their state. In this study, we are using the Florida MMP survey.

The 2015-2017 Florida MMP uses a collection of about 30 facilities state-wide to recruit participants—31% of the facilities included were Ryan White funded. Fifty percent of the facilities were in South Florida, 33% were in Central Florida, and 17% were in North Florida. Eligible facilities included any outpatient facility that provided HIV medical care at the time of sampling. HIV medical care was defined as conducting CD4 or HIV viral load testing and providing prescriptions for ART medication to treat and manage HIV. The facilities include free-standing clinics, private physician offices, and hospital-affiliated clinics (Centers for Disease Control and Prevention, 2015b). The Florida International University and the Florida Department of Health Institutional Review Boards have approved the protocol of this study.

Participants

The eligibility criteria for the MMP included: confirmed HIV diagnosis via HIV viral load or CD4/cells/lL lab report, age ≥18 years, ability to complete a survey in English or Spanish, ability to provide informed consent and attended an HIV primary-care visit at one of the sampled facilities within the year of data collection (Centers for Disease Control and Prevention, 2015b). The Florida MMP dataset included 910 participants. However, 139 participants were removed due to missing data from the response and explanatory variables. The final unweighted sample for our study was 771 participants. There were 89,889 participants in the final weighted sample.

Data Collection

The Medical Monitoring Project (MMP) data collection began with interviews of sampled persons by the MMP staff. Interviews were conducted with sampled participants, and a summary of their medical records was gathered (Centers for Disease

Control and Prevention, 2015b). The MMP staff also recorded medical record abstractions for participants with completed interviews who had received HIV care at eligible facilities. Participants were free to withdraw from the study at any point.

The questionnaire included 23 modules that were administered in all project areas: Basic Demographics; Disability; Financial; HIV Testing Experiences; Never In Care; HIV Care; HIV Treatment and Adherence; General Medical Care; Intimate Partner Violence; Health Literacy; Depression and Anxiety; Sexual Behavior; Alcohol, Smoking, and Drug Use; Stigma and Discrimination, etc. (Centers for Disease Control and Prevention, 2015b). In addition, interview data were collected with computer-assisted personal interviewing (CAPI), using an interview application developed by the Centers for Disease Control and Prevention (CDC). In rare cases, interviews were conducted with paper forms in the event of technological failures.

The MMP interview took approximately 45 minutes to complete and was available in both English and Spanish. Data for the dissertation analysis combined annual Florida MMP and Enhanced HIV/AIDS Reporting System (eHARS) data from 2015 to 2017 and were collected from June 2015 through the end of the 2017 data collection cycle in May 2018. To determine the associations between race/ethnicity, HIV-stigma, linkage to care, retention in care, and viral suppression, we focused on non-Hispanic Black, non-Hispanic White, and Hispanic participants because given the limited numbers of participants from other racial/ethnic groups in the study sample.

Weighting and Data Security

Data from the MMP were weighted according to known probabilities of selection in Florida. In addition, the data have been weighted to correct for person nonresponse and post-stratified to the National HIV Surveillance System (NHSS) population totals by sex, race/ethnicity, and age. This study also used the eHARS dataset to collect additional information such as age, as well as our outcome variables, including linkage to care within 30 days, retention in care, and viral suppression.

Data collected for MMP are subject to the CDC's Data Security and Confidentiality Guidelines for HIV, Viral Hepatitis, Sexually Transmitted Disease, and Tuberculosis programs. Several protocols have been developed at both the local and national levels to maintain data security, integrity, and confidentiality. No contact information is ever transmitted to the CDC regarding samples taken in the project area or nationally. MMP itself collects no direct personally identifiable information in its survey.

Measures

HIV-Related Stigma

In our study, HIV stigma was assessed via the HIV Stigma Scale (Wright et al., 2007). This is a 10-item measure that utilizes a 5-point Likert scale as follows: 0= strongly disagree, 1=somewhat disagree, 2= neutral, 3=some-what agree, 4= strongly agree. Overall stigma scores ranged between 0 and 40. In addition, each subscale had a continuous sum score based on the number of items for the subscale. Internal consistency for each of the HIV-related stigma subscales was as follows: Personalized Stigma (α=0.80), Anticipated Stigma (α=0.61), and Negative Self-Image (α=0.80). These internal consistency values are similar to previous studies using the Florida MMP dataset (R. Williams et al., 2020). A categorical measure was created for each stigma subscale using terciles for Personalized Stigma (0 = Low Personalized Stigma, 1 = Moderate Personalized Stigma, 2 = High Personalized Stigma) and Anticipated Stigma (0 = Low

Anticipated Stigma, 1 = Moderate Anticipated Stigma, 2 = High Anticipated Stigma). Due to the lack of range within the measure for Negative Self-Image we were unable to formulate a 3-level negative self-image variable. Therefore, we used the median value as cutoff to create a binary variable for negative self-image (0 = Low Negative Self-image Stigma, 1 = High Negative Self-Image Stigma).

The HIV Stigma Scale, conceptualized by Wright and colleagues (2017), assesses aspects of HIV stigma consisting of "negative self-image," "personalized stigma," "disclosure concerns," and "public attitude concerns" (Wright et al., 2007). Anticipated stigma refers to beliefs of discrimination, stereotyping, or prejudice from others in the future resulting from an individual's serostatus (Earnshaw et al., 2013). Enacted stigma refers to previous experiences with discrimination, stereotyping, or prejudice from others (Earnshaw et al., 2013). Internalized stigma refers to negative feelings and beliefs about themselves having HIV (Earnshaw et al., 2013). In the present study, internalized HIV stigma was operationalized using the Negative Self-Image subscale. Enacted stigma was operationalized using the Personalized Stigma subscale. Public Attitudes and Disclosure concerns surrounding HIV are operationalized as Anticipated Stigma (R. Williams et al., 2020).

Demographics: Individual participant characteristics were obtained from the Basic Demographics section of the MMP and eHARS survey. All the variables in the MMP were based on self-reported measures. This section included variables such as age (18-34, 35-49, 50+), education, race/ethnicity, gender, and marital status.

The following items were selected for analysis:

Age: Age at time of MMP participation was calculated using eHARS data and the year of MMP participation. In order to compare our results with those of previous research, we categorized our age variable according to previous research findings (Brown et al., 2018; T. J. Cunningham, 2019; Ssebutinde et al., 2018). The item was recoded as 0 = 18-35, 1 = 35-49, 2 = 50+.

Education: Participants were asked to report their highest level of education completed. Response options included: 1 = Never attended School, 2 = Grades 1-8, 3 = Grades 9-11, 4 = Grade 12 or GED, 5 = Some college, Associate's degree, or technical degree, 6 = Bachelor's degree, 7 = Any post-graduate studies. This variable was recoded into a binary variable as follows: 0 = High School/GED or less, 1 = Some College or greater.

Ethnicity: Participants were asked, "Do you consider yourself to be of Hispanic, Latino/a, or Spanish origin?" The item was coded 0 = No, 1 = Yes. This variable was recoded and combined with the race item to create a race/ethnicity variable. See item below.

Race: Participants were asked, "*Which racial group or groups do you consider yourself to be in? You may choose more than one option.*" Five racial categories were provided as response options: American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, and White. Each item was coded as 0 = No, 1 = Yes. For the present study, the variable was recoded and combined with our previously mentioned Hispanic ethnicity item to create a race/ethnicity as follows: 0 = Non-Hispanic White, 1 = Non-Hispanic Black or African American, 2 = Hispanic.

Gender: Participants were asked, “Do you consider yourself to be male, female, or transgender?” The item was coded as 1 = Male, 2 = Female, 3 = Transgender. For the analysis, we excluded those who identified as “Transgender” due to few responses. The final dichotomous variable was recoded as 0 = Male, 1 = Female.

Sexual orientation: Participants were asked, “*Do you think of yourself as (Lesbian or gay, Straight, Bisexual, Something else)?*” The item was coded as 1= Lesbian or gay, 2 = Straight, 3 = Bisexual, 4 = Something else. We collapsed “Something Else”, “Lesbian or gay”, and “Bisexual” into “Not Heterosexual”, as done in previous studies using the Florida MMP dataset (R. Williams et al., 2020). This variable was recoded as 0 = Heterosexual, 1 = Not Heterosexual.

Household Income: Participants were asked to report combined monthly or yearly household income from all sources before taxes. Response options were coded as follows: 1 = $0 to $416 per month or $0 to $4,999 per year, 2 = $417 to $833 per month or $5,000 to $9,999 per year, 3 = $834 to $1041 per month or $10,000 to $12,499 per year, 4 = $1042 to $1249 per month or $12,500 to $14,999 per year, 5 = $1250 to $1666 per month or $15,000 to $19,999 per year, 6 = $1667 to $2083 per month or $20,000 to $24,999 per year, 7 = $2084 to $2499 per month or $25,000 to $29,999 per year, 8 = $2500 to $2916 per month or $30,000 to $34,999 per year, 9 = $2917 to $3333 per month or $35,000 to $39,999 per year, 10 = $3334 to $4166 per month or $40,000 to $49,999 per year, 11 = $4167 to $4999 per month or $50,000 to $59,999 per year, 12 = $5000 to $6249 per month or $60,000 to $74,999 per year, 13 = $6250 or more per month or $75,000 or more per year.

This variable was recoded dichotomously based on the poverty line cut-off. According to the HHS Poverty Guidelines, the poverty line for household income for 2015, 2016, and 2017 ranged from $24,250 (2015) to $24,600 (2017) (U.S. Department of Health and Human Services, 2021b). As such, we made our poverty line cut off at "$1667 to $2083 per month or $20,000 to $24,999 per year" for the analysis. Each category at and below, "$1667 to $2083 per month or $20,000 to $24,999 per year," was collapsed and coded as 0= At/Below Poverty level. Each category above "$1667 to $2083 per month or $20,000 to $24,999 per year" was coded as 1=Above Poverty level.

Health Insurance Coverage: The following items regarding health insurance coverage were recoded to create one variable in the analysis to control for health insurance coverage. Participants were asked: *"During the past 12 months, have you had any of the following types of insurance or other coverage for any type of healthcare?".* The response options were coded as 0 = No, 1 = Yes. The items were recoded into a variable to include all the health insurance coverage items. The variables *"Did you have private health insurance?" and "Did you have any other insurance?*" were recoded as 0 = Private Insurance. The variables *"Did you have Medicaid?", "Did you have Medicare?", "Did you have coverage through Ryan White HIV/AIDS Program or AIDS Drug Assistance Program, also called ADAP?", "Did you have Tricare or CHAMPUS/CHAMPVA?", "Did you have Veterans Administration coverage?", and "Did you have city, county, state or other publicly funded insurance, not including Medicaid?"* were recoded as 1 = Public Insurance.

Substance Use

Alcohol misuse: Participants were asked, "*During the past 30 days, on how many days did you have 5 or more alcoholic drinks in one sitting?*" The item was recoded from a continuous variable to a dichotomous variable with 0 = "*No alcohol misuse"* if participants reported no days of having five or more drinks in one sitting and 1 = *"alcohol misuse"* if participants reported at least one day of having five or more drinks in one sitting (SAMSHA, 2019).

Non-injection drug use: Participants were asked, *"During the past 12 months, did you use any non-injection drugs?"* The item was coded as 0 = *"No",* 1 = *"Yes"*

Outcomes of Interest

The outcomes of interest in this study include linkage to care, retention in care, and viral suppression. We matched the year each participant completed the MMP survey with their linkage to care, retention in care, and viral suppression data from that same year derived from the eHARS dataset.

Linkage to care was defined as evidence of an HIV laboratory test (HIV viral load or CD4/cells/lL) within 30 days of the HIV diagnosis. This variable was calculated by FDOH and measured in the eHARS data as "Linked to care in 30 days of HIV diagnosis" and coded as 0 = No and 1 = Yes.

Retention in care was defined as documented evidence of CD4 or viral load lab results of two outpatient HIV visits at least 90 days apart in the past 12 months. Retention in care was measured in the eHARS data as "2 or more HIV medical visits/labs 3 mo. apart in [Survey Year]". This variable was coded as 0 = No 1 = Yes.

Viral suppression was referred to as someone with an HIV RNA level of ≤ 200 copies per milliliter at measurement or undetectable. This variable was measured in the eHARS data as “Has a suppressed VL (<200 copies/mL) on the last VL in [Survey Year]”. This variable was coded as 0 = No and 1 = Yes.

Data Analysis

The data was cleaned and managed in SPSS version 25. All descriptive analyses and dummy variables were performed using SPSS version 25 as well. The binary logistic analysis was analyzed using SAS version 9.5. The descriptive analysis was conducted to describe the study population and assess the study variables' distribution. Descriptive statistics, including means, standard deviations, frequencies, and proportions, were generated for all continuous and categorical variables of interest. Multicollinearity was also assessed using variance inflation factor (VIF) and tolerance values. According to literature, there is no formal cutoff for tolerance and VIF, however, tolerance values less than 0.2 may indicate collinearity, and VIF values above 2.5 in logistic regression may also indicate collinearity problems (Senaviratna & A. Cooray, 2019). Our variance inflation factor values were less than 1.6, and tolerance levels were all greater than 0.6 to rule out multicollinearity. Sample characteristics were stratified by race/ethnicity and HIV outcome (linkage to care, retention in care, and viral suppression). Using Chi-Square tests to compare proportions, we were able to carry out comparisons between groups. A binary logistic regression analysis was performed to identify significant associated risk factors. Binary logistic regression is used under the assumptions of binary responses, independent observations, little or no multicollinearity, linearity of independent variables and log odds, as well as a large sample size (Stoltzfus, 2011).

Bivariate regression analysis of all key variables, including predictors of interest and covariates, were conducted to show the associations of each unique variable on linkage to care, retention in care, and viral suppression in the unadjusted models. To be selected for the adjusted model, the unadjusted model p-value was set to 0.2. The predictors of interest were the following: Personalized HIV stigma, Negative Self-image, and Anticipated Stigma. We calculated the adjusted models based on the above outcomes and predictors based on demographic characteristics and risk factors. Results are shown in Tables 2-4. To be considered statistically significant in the adjusted model, the p-value was set at $p < 0.05$.

A sampling weight is used in the study to provide a representative sample of the people living with HIV in Florida. Therefore, the findings from this study were generalizable to the State of Florida during the survey periods from June 2015 through May 2018. We tested for model fit by using the Hosmer and Lemeshow Goodness-of-Fit Test. We re-measured the Hosmer and Lemeshow Goodness-of-Fit Test using unweighted data in instances where the weighted sample presented an issue. If the p-value>0.05, then the model was considered not a good fit for the data. We also created ROC curves and calculated the Area Under the Curve (AUC) to further determine if the models were not a poor fit for the data. The possible values for AUC from 0.5 (no diagnostic ability) to 1 (perfect diagnostic ability) (NCSS, 2021).

Chapter IV: RESULTS

This study examined the relationship between HIV-related stigma and outcomes along the HIV care continuum, including linkage to care, retention in care, and viral suppression, as well as the moderating effects of race/ethnicity on those associations. The study was conducted using weighted cross-sectional datasets from the 2015-2017 Medical Monitoring Project. We used binary logistic regression models due to the binary HIV care continuum responses. The unadjusted bivariate regression models examined the associations between distinct HIV-related stigma subtypes, and outcomes of interest. We also accessed for key covariates that influenced our outcomes of interest. In adjusted models, we included covariates that were significant at p-value <0.2 in the bivariate analysis. Interaction effects between race/ethnicity and each of the three HIV related stigmas on HIV care continuum outcomes were tested. Based on the results of the interaction analyses, subsequent models stratified by race/ethnicity were estimated.

Descriptive Characteristics

The study sample consisted of n=771 and a weighted sample of 89,889 representing the HIV population across Florida from 2015-2017. We assessed for multicollinearity across all key predictors (HIV-related stigmas: negative self-image, personalized stigma, and anticipated stigma). Based on the obtained values for tolerance and VIF, it was concluded that there was no multicollinearity across key predictors. As such, the three stigma types were included simultaneously in the logistic regression modes. Among respondents, 70.3% identified as male, and 29.7% as female. Those who identified as transgender were removed from the analysis due to the small sample size. Most of our sample was over the age of 50 (59.2%), non-Hispanic Black (50.0%), heterosexual (60.8%), and used public health insurance (62.5%). Most of our sample reported no binge drinking (87.4%) and no non-injected drug use (73.0%). The distributions of the weighted sample across the distinct HIV-related stigma variables were as follows: For personalized stigma, 25.9% reported high levels, 34.1% moderate, and 39.9% low levels of personalized stigma. For negative self-image, 34.0% reported high levels of negative self-image, and 66.0% reported low levels of negative self-image stigma. There was no moderate level of negative self-image due to the lack of range of the variable. We used the median value for the continuous negative self-image variable to determine the ranges in formulating a binary (high/low) variable. For anticipated stigma, 32.1% reported high levels of anticipated stigma, 30.0% reported moderate levels of anticipated stigma, and 32.1% reported low levels of anticipated stigma. From the weighted sample, only 34.1% of respondents were linked to HIV care within 30 days after initial diagnosis, 83.5% of respondents were retained in care, and 73.0% of respondents were virally suppressed. The sample demographics stratified by linkage to care, retention in care, and viral suppression are presented in Table 1.

AIM 1: Logistic regression of HIV related stigma on Linkage to Care

Personalized stigma

Results from the unadjusted logistic models indicated that those reporting high levels of personalized stigma (compared to low personal stigma) (OR=1.002, CI: [0.968, 1.037], p=0.921) were not significantly different in linking to care within 30 days of initial HIV diagnosis. However, those reporting moderate levels of personalized stigma (compared to low personalized stigma) (OR= 0.838, CI: [0.812, 0.866], p=<0.001) were less likely to be linked to care within 30 days of diagnosis. The adjusted model controlled for the following socioeconomic variables that were significant in the unadjusted model (age, race/ethnicity, household income, education, gender, sexual orientation, and health insurance), substance use (non-injected drug use and binge drinking). Given that there was no collinearity evident between HIV-related stigma subtypes, we adjusted for negative self-image and anticipated stigma when assessing personalized stigma. In the final adjusted model, there was no significant association between high levels of personalized stigma (compared to low personalized stigma) (AOR=1.007, CI: [0.969, 1.046], p=0.583) and linkage to care within 30 days of initial HIV diagnosis. Those with moderate levels of personalized stigma (compared to low personalized stigma) (AOR=0.795, CI: [0.768, 0.822], p=<0.001) remained significantly less likely to be linked to care within 30 days of diagnosis.

Negative self-image

Results for the unadjusted logistic models found that those reporting high levels of negative self-image (compared to low negative self-image) (OR=1.185, CI: [1.151, 1.220], p=<0.001) were significantly more likely to be linked to care within 30 days of diagnosis. Given that there was no collinearity evident between HIV-related stigma subtypes, we adjusted for personalized stigma and anticipated stigma when assessing negative self-image. In the final adjusted model, those with high levels of negative self-image (compared to low negative self-image stigma) (AOR=1.242, CI: [1.206, 1.286], p=<0.001) remained significantly more likely to be linked to care within 30 days of initial HIV diagnosis.

Anticipated stigma

Results from the unadjusted logistic models indicated that those with moderate levels of anticipated stigma (compared to low anticipated stigma) (OR= 1.113, CI: [1.077, 1.151], p=<0.001) were significantly more likely to be linked to care within 30 days of diagnosis. However, those reporting high levels of anticipated stigma (compared to low anticipated stigma) (OR=1.011, CI: [0.978, 1.045], p=0.528) were not significantly different in linking to care within 30 days of initial HIV diagnosis. Since there was no collinearity evident between HIV-related stigma subtypes, we adjusted for negative self-image and personalized stigma when assessing anticipated stigma. The final adjusted model revealed that those with high levels of anticipated stigma (compared to low anticipated stigma) (AOR=1.061, CI: [1.021, 1.102], p=0.003) and moderate levels of anticipated stigma (compared to low anticipated stigma) (AOR=1.197, CI: [1.156, 1.239], p=<0.001) were more likely to be linked to care within 30 days of initial HIV diagnosis.

Individuals who identified as between the ages of 18-34 (compared to 35-49) (AOR=1.011, CI:[0.965, 1.058], p=<0.001), Black (compared to White) (AOR=1.083, CI:[1.043, 1.125], p=<0.001), Hispanic (compared to White) (AOR=1.297, CI: [1.245, 1.351], p=<0.001), not heterosexual (compared to heterosexual) (AOR=1.441, CI: [1.391, 1.493], p=<0.001), and having 5 or more drinks in a day in the last 30 days (compared to no binge drinking) (AOR=1.442, CI: [1.379, 1.508], p=<0.001) all had significantly greater odds of being linked to care within 30 days of initial HIV diagnosis. Individuals who identified as female (compared to male) (AOR=0.870, CI: [0.838, 0.903], p=<0.001), had a high school/GED or less education (compared to Some College or

More) (AOR=0.927, CI: [0.898, 0.956], p=<0.001), reported non-injected drug use in past 12 months (compared to no non-injected drug use) (AOR=0.784, CI: [0.758, 0.810], p=0.001) were less likely to be linked to care within 30 days of initial HIV diagnosis. Poverty level, insurance type, and ages 50 years and over were not significantly associated with linkage to care within 30 days of diagnosis. Findings were reported in Table 2. We created a ROC curve and the Area Under the Curve = 0.5956, which identified the model's predictive ability to be correct nearly 60% of the time. The Hosmer and Lemeshow Goodness-of-Fit Test $\chi 2$ p=0.271, indicated the model was not a poor fit for the data.

Racial/ethnic disparities in linkage to care within 30 days of diagnosis

From 2015-2017, the proportion of cases not linked to care within 30 days of diagnosis was higher among Non-Hispanic Blacks (68.7%) compared to Hispanics (59.8%) and non-Hispanic whites (65.7%). We examined the interaction between race/ethnicity and the three stigma types to determine moderating effects and whether subsequent analyses should be stratified by race/ethnicity. Specifically, we examined multiple race/ethnicity × HIV-related stigma subtype interactions to explore whether the relationship between HIV-related stigma subtypes and linkage to care within 30 days of diagnosis differed based on race/ethnicity. The interactions were found to be statistically significant for the moderation effect on the relationship between linkage to care within 30 days and HIV-related stigma variables (race/ethnicity × personalized stigma [p<0.0001, χ^2=271.47], race/ethnicity × negative self-image [p=0.001, χ^2=17.36], and race/ethnicity × anticipated stigma [p<0.001, χ^2=1296.03]) and presented in Table 2. Results indicated significant moderating effects of race/ethnicity across all examined interactions.

Based on findings from the moderation analyses, subsequent models stratified by race/ethnicity were conducted. All covariates in the unstratified models were included in the subsequent stratified models (see Table 5). Results showed that non-Hispanic whites with high levels of personalized stigma were less likely to be linked to care (AOR=0.857, CI: [0.796-0.923], p<.0001). Conversely, high levels of personalized stigma were associated with an increased likelihood of being linked to care within 30 days of diagnosis among non-Hispanic Blacks and Hispanics (AOR=1.216, CI: [1.149-1.287], p<.0001; AOR=1.247, CI: [1.137-1.369], p<.0001, respectively). Moderate levels of personalized sigma (compared to low personalized stigma) were associated with a decreased likelihood of being linked to care among non-Hispanic Blacks and Hispanics (AOR=0.785, CI: [0.785-0.827], p<.0001; AOR=0.606, CI: [0.559-0.657], p<.0001, respectively), with no significant associations among non-Hispanic whites.

As displayed in Table 5, high levels of negative self-image were associated with a greater likelihood of being linked to care among non-Hispanic whites and non-Hispanic Blacks (AOR=1.328, CI: [1.248-1.413], p<.0001; AOR=1.120, CI: [1.068-1.175], p<.0001, respectively). However, no significant associations between high levels of negative self-image and being linked to care were found among Hispanic (AOR=0.935, CI: [0.861-1.015], p=0.109). Additionally, high levels of anticipated stigma were associated with an increased likelihood of being linked to care among non-Hispanic whites and non-Hispanic Blacks (AOR= 1.140, CI: [1.055-1.232], p=0.0009; AOR= 1.318, CI: [1.245-1.396], p=<.0001, respectively). Conversely, high levels of anticipated stigma were associated with a decreased likelihood of being linked to care among Hispanics (AOR= 0.816, CI: [0.748-0.889], p=<.001). Moderate levels of anticipated stigma (compared to low anticipated stigma) were also associated with a higher likelihood of being linked to care among non-Hispanic whites and non-Hispanic Blacks (AOR= 1.107, CI: [1.040-1.178], p=0.001; AOR= 2.346, CI: [2.216-2.484], p=<.001) and with a lower likelihood of being linked to care among Hispanics (AOR= 0.387, CI: [0.357-0.420], p=<.001).

AIM 2: Logistic regression of HIV related stigma on Retention in Care

Personalized stigma

Results from the unadjusted logistic models found a greater likelihood of being retained in care among those reporting high levels of personalized stigma (compared to low personalized stigma) (OR=1.951, CI: [1.859, 2.049], p=0.001). Additionally, those reporting moderate levels of personalized stigma (compared to low personalized stigma) (OR= 1.134, CI: [1.090, 1.180], p=<0.001) were significant more likely to be retained in HIV care. The adjusted model controlled for the following socioeconomic variables that were significant in the unadjusted model (age, race/ethnicity, household income, education, gender, sexual orientation, and health insurance), and substance use (non-injected drug use and binge drinking). Since there was no collinearity between HIV-related stigma subtypes, we adjusted for negative self-image and anticipated stigma when assessing personalized stigma. In the final adjusted model, high levels of personalized stigma (compared to low personalized stigma) (AOR=2.030, CI: [1.919, 2.148], p=<0.001) and moderate levels of personalized stigma (compared to low personalized stigma) (AOR=1.570, CI: [1.501, 1.643], p=<0.001 remained significantly associated with greater odds of being retained in care.

Negative self-image

Results from the unadjusted logistic models revealed that those reporting high levels of negative self-image (compared to low negative self-image) (OR=0.874, CI: [0.842, 0.906], p=<0.001) were less likely to be retained in HIV care. The adjusted model controlled for socioeconomic variables (age, household income, education, gender, sexual orientation, and health insurance) and substance use (non-injected drug use and benign drinking). Given that no collinearity was evident between HIV-related stigma subtypes, we adjusted for personalized stigma and anticipated stigma when assessing negative self-image. In the final adjusted model, high levels of negative self-image (compared to low negative self-image stigma) (AOR=0.876, CI: [0.876, 0.915], p=<0.001) remained significantly associated with a decreased likelihood of being retained in care.

Anticipated stigma

Results from the unadjusted logistic models indicated that those reporting high levels of anticipated stigma (OR=0.484, CI: [0.463, 0.507], p=<0.001) and moderate levels of anticipated stigma (OR= 0.476, CI: [0.455, 0.498], p=<0.001) (compared to low anticipated stigma) were less likely to be retained in HIV care. Since there was no collinearity between HIV-related stigma subtypes, we adjusted for personalized stigma and negative self-image when assessing anticipated stigma. In the final adjusted model, high levels of anticipated stigma (compared to low anticipated stigma) (AOR=0.500, CI: [0.474, 0.527], p=<0.001) and moderate levels of anticipated stigma (compared to low anticipated stigma) (AOR=0.520, CI: [0.495, 0.547], p=<0.001) remained significantly associated with a decreased odds of being retained in care.

A greater likelihood of being retained in HIV care was found among those who identified as female (compared to male) (AOR=1.226, CI: [1.167,1.288], p=<0.001), Hispanic (compared to White) (AOR=1.727, CI:[1.607, 1.858], p=<0.001), not heterosexual (compared to heterosexual) (AOR=1.199, CI:[1.140, 1.260], p=<0.001), living above poverty level (compared to at/below poverty level) (AOR=1.133 (1.079, 1.189), and having public insurance (compared to private insurance) (AOR=3.799, CI: [3.628, 3.980], p=<0.001).

A decreased likelihood of being retained in HIV care was found among those who identified as between the ages of 18-34 (compared to 35-49) (AOR=0.531, CI: [0.498, 0.567], p=<0.001), 50 years or older (compared to 35-49) (AOR=0.493, CI: [0.468, 0.519], p=<0.001), had a high school/GED (compared to some college or more) (AOR=0.399, CI: [0.382, 0.417], p=<0.001), were Black (compared to White) (AOR=0.499, CI: [0.473, 0.526], p=<0.001), reported non-injected drug use in past 12 months (compared to no non-injected drug use) (AOR=0.573, CI: [0.549, 0.599], p=0.001), and reported binge drinking in the last 30 days (compared to no binge drinking) (AOR=0.644, CI: [0.606, 0.683], p=<0.001). Findings were reported in Table 3. We created a ROC curve and the Area Under the Curve = 0.730, indicating the model’s predictions may be correct nearly 73% of the time. The unweighted Hosmer and Lemeshow Goodness-of-Fit Test χ^2 p=0.262, indicated the model was not a poor fit for the data. We used the unweighted Hosmer and Lemeshow Goodness-of-Fit Test because this test does not work properly for sample sizes over 25,000 (Yu et al., 2017).

Racial/ethnic disparities in Retention in Care

From 2015-2017, the proportion of cases not retained in care was higher among non-Hispanic Blacks (22.7%) compared to Hispanics (6.4%) and non-Hispanic whites (13.2%). We examined three interactions to determine whether models should be stratified by race/ethnicity. Specifically, we explored multiple race/ethnicity × HIV-related stigma subtype interactions to explore whether the relationship between HIV-related stigma subtypes and retention in care differed based on race/ethnicity. The interactions were found to be statistically significant for the moderation effect on the relationship between retention in care and HIV-related stigma variables (race/ethnicity × personalized stigma [$p<0.0001$, $\chi^2=560.80$], race/ethnicity × negative self-image [$p<0.0001$, $\chi^2=162.63$], and race/ethnicity × anticipated stigma [$p<0.0001$, $\chi^2=210.95$]). The race/ethnicity-stratified model also controlled for all covariates included in the non-stratified models.

Stratified analysis by race/ethnicity are presented in Table 5. Results indicated high levels of personalized stigma were associated with higher likelihood of retention in care across all racial-ethnic groups. However, the association was substantially stronger among non-Hispanic whites (AOR=6.077, CI: [5.215-7.115] p<.001), compared to non-Hispanic blacks (AOR=1.394, CI: [1.304-1.492], p<.0001), and Hispanics (AOR=1.660, CI: [1.197-2.314], p=0.003). Moderate levels of personalized stigma (compared to low personalized stigma) were also associated a higher likelihood of retention in care across all racial-ethnic groups, but with a greater likelihood among non-Hispanic whites (AOR=2.879, CI: [2.621-3.166], p<.001), compared to non-Hispanic blacks AOR=1.132, CI: [1.070-1.198], p<.0001), and Hispanics (AOR=1.449, CI: [1.176-1.787], p=0.001).

As seen in Table 5, substantial differences across race ethnicity were found in the association between high levels of negative self-image (compared to low negative self-image) and retention in case whereby high levels of negative self-image were associated with a higher likelihood of being retained in care among Hispanics (AOR=7.199, CI: [5.642-9.258], p<0.001) and to a lesser degree among non-Hispanic whites (AOR=1.149, CI: [1.037-1.274], p=0.008). Conversely, non-Hispanic Blacks with high levels of negative self-image were found to have a lower likelihood of being retained in care (AOR=0.651, CI: [0.617-0.686], p<0.001). Additionally, high levels of anticipated stigma (compared to low anticipated stigma) were associated with a lower likelihood of being retained in care across all racial-ethnic groups (non-Hispanic whites: AOR= 0.740, CI: [0.651-0.841], p=<.001; non-Hispanic Blacks: AOR= 0.475, CI: [0.445-0.507], p=<.001; Hispanics: AOR= 0.681, CI: [0.520-0.893], p=0.005). Moderate levels of anticipated stigma (compared to low anticipated stigma) were also associated with a lower likelihood of being retained in care among non-Hispanic whites, non-Hispanic Blacks, and Hispanics (AOR= 0.687, CI: [0.627-0.753], p<0.001; AOR= 0.475, CI: [0.444-0.508], p=<.001; AOR= 0.223, CI: [0.185-0.268], p=<.001, respectively).

AIM 3: Logistic regression of HIV related stigma on Viral Suppression

Personalized stigma

Results from the unadjusted logistic models revealed that those reporting high levels of personalized stigma (OR=1.089, CI: [1.049, 1.130], p=0.001) and moderate levels of personalized stigma (OR= 1.135, CI: [1.097, 1.175], p=<0.001) were both at significantly increased odds of being virally suppressed (compared to low personalized stigma). The adjusted model controlled for the following socioeconomic variables that were significant in the unadjusted model (age, race/ethnicity, household income, education, gender, sexual orientation, and health insurance), and substance use (non-injected drug use and binge drinking). Since there was no collinearity between HIV-related stigma subtypes, we adjusted for negative self-image and anticipated stigma when assessing personalized stigma. In the final adjusted model, both high levels of personalized stigma (AOR=1.430, CI: [1.370, 1.493], p=<0.001) and moderate levels of personalized stigma (AOR=1.468, CI: [1.414, 1.525], p=<0.001) (compared to low personalized stigma) remained significant with having a suppressed viral load.

Negative self-image

Conversely, findings from the unadjusted logistic models found that those reporting high levels of negative self-image (compared to low negative self-image) (OR=0.690, CI: [0.670, 0.712], p=<0.001) were at significantly decreased odds of being virally suppressed. The adjusted model controlled for socioeconomic variables (age, household income, education, gender, sexual orientation, and health insurance) and substance use (non-injected drug use and benign drinking). Since there was no collinearity between HIV-related stigma subtypes, we adjusted for personalized stigma and anticipated stigma when assessing negative self-image. In the final adjusted model, high levels of negative self-image (compared to low negative self-image stigma) (AOR=0.673, CI: [0.673, 0.697], p=<0.001) were significantly associated with a decreased likelihood of having a suppressed viral load.

Anticipated stigma

Findings from the unadjusted logistic models indicated significantly decreased odds of being virally suppressed among those reporting high levels (OR=0.648, CI:

[0.625, 0.671], p=<0.001) and moderate levels of anticipated stigma (OR= 0.842, CI: [0.811, 0.873], p=<0.001) (compared to low anticipated stigma). Given that there was no collinearity evident between HIV-related stigma subtypes, we adjusted for personalized stigma and negative self-image when assessing anticipated stigma. In the final adjusted model, high levels of anticipated stigma (compared to low anticipated stigma) (AOR=0.943, CI: [0.904, 0.983], p=0.006) remained significantly associated with decreased odds of being virally suppressed, whereas moderate levels of anticipated stigma (AOR=1.00, CI: [0.0.961, 1.041], p=<0.991) did not.

Increased odds of being virally suppressed were found among individuals who identified as Hispanic (compared to White) (AOR=1.779, CI: [1.682, 1.883], p<0.001), not heterosexual (compared to heterosexual) (AOR=1.185, CI: [1.137, 1.234], p<0.001), lived above poverty level (compared to at/below poverty level) (AOR=1.112, CI: [1.067, 1.158], p<0.001), and had public insurance (compared to private insurance) (AOR=1.252, CI: [1.205, 1.300], p=<0.001). Conversely, decreased odds of viral suppression were found among those who identified as female (compared to male) (AOR=0.837, CI: [0.805, 0.869], p=<0.001), between the ages of 18-34 (compared to 35-49) (AOR=0.520, CI:[0.495, 0.547], p=<0.001), 50 years or older (compared to 35-49) (AOR=0.763, CI: [0.734, 0.794], p=<0.001), high school/GED (compared to some college or more) (AOR=1.083, CI:[1.046, 1.121], p=<0.001), Black (compared to White) (AOR=0.394, CI:[0.378, 0.411], p=<0.001), reported non-injected drug use in past 12 months (compared to no non-injected drug use) (AOR=0.698, CI: [0.674, 0.724], p=<0.001), and engaged in binge drinking in the last 30 days (compared to no binge drinking) (AOR=0.612, CI: [0.582, 0.643], p=<0.001) (See Table 4). A ROC curve was created, and the Area Under the Curve = 0.699, which means the model's predictions may be correct nearly 70% of the time. The unweighted Hosmer and Lemeshow Goodness-of-Fit Test $\chi 2$ p=0.829, which means the model is not a poor fit for the data. However, the weighted Hosmer and Lemeshow Goodness-of-Fit Test $\chi 2$ p=<0.001. We used the unweighted Hosmer and Lemeshow Goodness-of-Fit Test because this test does not work properly for sample sizes over 25,000 (Yu et al., 2017).

Racial/ethnic disparities in Viral Suppression

From 2015-2017, the proportion of cases that were not virally suppressed was higher among non-Hispanic Blacks (37.6%) compared to Hispanics (11.4%) and non-Hispanic whites (19.9%). We examined three interactions to determine whether models should be stratified across race/ethnicity. We examined multiple race/ethnicity × HIV-related stigma subtype interactions to explore whether the relationship between HIV-related stigma subtypes and retention in care differed based on race/ethnicity. The interactions were found to be statistically significant for the moderation effect on the relationship between retention in care and HIV-related stigma variables (race/ethnicity × personalized stigma [$p<0.001$, $\chi^2=987.31$], race/ethnicity × negative self-image [$p<0.0001$, $\chi^2=280.65$], and race/ethnicity × anticipated stigma [$p<0.0001$, $\chi^2=583.56$]). Results indicated significant moderating effects of race/ethnicity across all examined interactions. The race/ethnicity-stratified model controlled for all covariates examined in the non-stratified model.

Table 5 presents results for the stratified models. Results revealed high levels of personalized stigma (compared to low personalized stigma) was associated with a higher likelihood of viral suppression among non-Hispanic whites (AOR=3.182, CI: [2.900-

3.493], p<.001) and with a decreased likelihood of viral suppression among Hispanics (AOR=0.763, CI: [0.655-0.889], p=0.001). No significant associations were found among non-Hispanic Blacks (AOR=1.036, CI: [0.982-1.093], p=0.194). For moderate levels of personalized stigma (compared to low personalized stigma), results revealed a higher likelihood of viral suppression among non-Hispanic whites (AOR=3.459, CI: [3.185-3.757], p<.001) and to a lesser degree among non-Hispanic Blacks (AOR=1.240, CI: [1.183-1.300], p<.001). Conversely, among Hispanics moderate levels of personalized stigma was associated with a lower likelihood of viral suppression (AOR=0.481, CI: [0.427-0.543], p<0.001).

As presented in Table 5, high levels of negative self-image and was associated with a lower likelihood of viral suppression among non-Hispanic whites and non-Hispanic Blacks (compared to low negative self-image) (AOR= 0.410, CI: [0.379-0.443], p<.001; AOR= 0.599, CI: [0.573-0.626], p<.001, respectively). Conversely, high levels of negative self-image were associated with a higher likelihood of viral suppression (AOR= 1.420, CI: [1.250-1.615], p<.001) among Hispanics. High levels of anticipated stigma (compared to low anticipated stigma) were associated with a lower likelihood of viral suppression among non-Hispanic whites (AOR= 0.667, CI: [0.604-0.737], p=<.001). Conversely, findings revealed Hispanics who reported high levels of anticipated stigma had a higher likelihood of viral suppression (AOR= 2.377, CI: [2.076-2.727], p<0.001). No significant associations were found with between high anticipated stigma and viral suppression among non-Hispanic Blacks (AOR= 0.951, CI: [0.904-1.000], p=0.052). Moderate levels of anticipated stigma were associated with a higher likelihood of viral suppression among non-Hispanic Black and Hispanics (compared to low anticipated stigma) (AOR= 1.111, CI: [1.054-1.172], p<.001; AOR= 2.509, CI: [2.208-2.857], p<.001, respectively). Conversely, among non-Hispanic whites’ moderate levels of anticipated stigma (compared to low levels of anticipated stigma) was associated with a lower likelihood of viral suppression (AOR= 0.426, CI: [0.395-0.459], p<0.001).

Chapter V: DISCUSSION

The present study examined the relationship between HIV-related stigma and the HIV care continuum and if those associations differed by race/ethnicity in a sample of PLWH in Florida. Specifically, we examined the association of personalized stigma, negative self-image, and anticipated stigma on linkage to HIV care, retention in HIV care, and viral suppression among Hispanics, non-Hispanic Blacks, and non-Hispanic whites in Florida. Our findings revealed only 34.1% of the study population was linked to care within 30 days of diagnosis between 2015 and 2017. This rate of linkage to care is far lower than the 67.0% (2015), 69.6% (2016), and 74.8% (2017) reported by the Florida Department of Health for the sample years (Florida Department of Health, 2019). It should be noted that this may be due to misclassification of individuals in our analysis. Misclassification may have occurred because we did not have data regarding the state where participants were diagnosed. For participants diagnosed outside of Florida, it is possible that we did not have accurate information about their first medical encounter after diagnosis given that eHARS only captures laboratory tests conducted in Florida. In addition, approximately 60% of the participants in our study were over 50 years of age and may have been diagnosed years before current models of care were implemented. Given that the protocol of linking new diagnoses to care within 30 days has only been in effect for six years, many of our participants might have been linked to care within 90 days after diagnosis using the previous criteria (The White House, 2015).

Sample distributions for retention in care and viral suppression were closer to those reported for Florida by the State's Department of Health. Specifically, 83.5% of our sample was retained in care, compared to 72.9% (2015), 73.2% (2016), and 76.9% (2017)

reported by the Florida Department of Health (2019). Meanwhile, 71.5% of our sample were virally suppressed, compared to 60.0% (2015), 62.3% (2016), and 67.4% (2017) reported by the Florida Department of Health (2019). Our rates of retention and viral suppression may be due in part to te study sample being mostly recruited from clinics. Findings also indicated some non-linear relationships between HIV-related stigma subtypes and HIV care continuum outcomes. In the overall sample, low personalized stigma, high negative self-image, and high anticipated stigma were associated with a greater likelihood of being linked to care. Conversely, higher personalized stigma, lower negative self-image and low anticipated stigma were associated with an increased likelihood of being retained in care and virally suppressed. Additionally, differences across race/ethnicity were found in the association between HIV-related stigma subtypes and HIV care continuum outcome among non-Hispanic Black, Hispanic, and non-Hispanic white persons living with HIV in Florida. Details and interpretations of these findings are discussed below.

HIV-Related Stigma along the HIV Care Continuum

HIV-related stigma includes a variety of distinct types, including negative self-image, anticipated stigma, and personalized stigma. Anticipated stigma refers to the *expectation* of experiencing discrimination, stereotyping, or prejudice from others due to HIV status (Earnshaw et al., 2013). Personalized stigma (also known as enacted stigma) refers to the feeling of shame experienced due to *actual* experiences with discrimination, stereotyping, or prejudice (Earnshaw et al., 2013). Negative self-image (also referred to as internalized stigma) is the *unfavorable self-perceptions* or beliefs of one's own positive

HIV status (Earnshaw et al., 2013). Following is a discussion of the impact of these HIV-related stigma subtypes and their differences in the impact on the HIV care continuum.

Aim 1 assessed HIV-related stigma and linkage to HIV care within 30 days of receiving an HIV diagnosis. HIV-related stigma is often associated with a decreased likelihood of being linked to care (Fortenberry et al., 2012; Hussen et al., 2015; Maughan-Brown et al., 2019). In line with previous studies, our findings for Aim 1 suggest that lower levels of personalized stigma are associated with a higher likelihood of linkage to care compared to those with moderate levels of personalized stigma. We found that moderate levels of personalized stigma compared with low levels were associated with a 20.5% lower likelihood of linkage to care within 30 days of diagnosis. However, high levels of personalized stigma were not associated with linkage to care within 30 days of receiving an HIV diagnosis. This finding might be due to the nearly 65% of participants in the sample not being linked to care within 30 days and experienced high levels of personalized stigma. This finding suggests while the prevalence of personalized stigma may be high among PLWH many are still able to be linked to care. Research suggests that resilience factors, such as adaptive coping and community empowerment may enable individuals who experience high levels of personalized stigma to remain involved in the healthcare system (Earnshaw et al., 2015). Specifically, resilience is the ability to adapt and grow despite adverse circumstances (Fletcher et al., 2020). Future research directions should include further exploration of resiliency factors that buffer the effect of HIV-related stigma on engagement in care among PLWH (Turan et al., 2019).

Our second overall findings for Aim 1 suggest that increased levels of anticipated stigma and negative self-image are associated with a higher likelihood of being linked to care. Anticipated stigma and negative self-image serving as protective factors counter what previous research has suggested (Fortenberry et al., 2012; Hussen et al., 2015; Maughan-Brown et al., 2019) . One plausible explanation for these findings may also be due to factors associated with coping mechanisms that were not controlled for with the MMP eHARS dataset. Indeed, a study of 200 PLWH in Vermont and Massachusetts found that experienced increasing levels of anticipated stigma and negative self-image was associated with lower levels of self-esteem. In contrast, this association was weakened among participants with high levels of engagement coping, which refers to a strategy of engaging with stressful situations and enhancing a sense of personal control or adapting to a stress situation (Varni et al., 2012). Therefore, the seemingly protective association of anticipated stigma and negative self-image may be due to other factors at play, such as engagement coping, that were not assessed in the present study. Future research examining the impact of coping mechanisms in the associations between these HIV stigma types and linkage to care is warranted. Mixed methods studies that comprehensively explore negative self-image and anticipated stigma should also be conducted to better understanding the underlying mechanisms driving the positive relationship between these forms of stigma and linkage to care among PLWH in Florida.

In Aim 2, we assessed HIV-related stigma and retention in HIV care. There is limited existing research examining the association between HIV-related stigma and retention in HIV care (Davtyan et al., 2017; Hussen et al., 2015; Lindau et al., 2006; Schuster et al., 2005; Wingood et al., 2007). In a study by Hussen et al. (2015), researchers found that negative self-image was negatively associated with retention in care (OR=0.95; 95% CI 0.91–0.99). The study found that those with a negative self-image were more likely to miss an appointment in the last three months. Consistent with previous studies, our findings revealed that lower levels of anticipated stigma and negative self-image were associated with increased retention in care. Specifically, high levels of negative self-image stigma were associated with a 12.4% lower likelihood of retention in care. High and moderate levels of anticipated stigma (compared to low levels) were associated with a 50% and 48% lower likelihood of retention in care, respectively. According to a study conducted by Varni et al. (2012), negative self-image and anticipated stigma are associated with anxiety and depression in respondents who avoid stressors as a way of coping. Within the context of the HIV-Related Stigma Framework anticipated stigma and negative self-image may also negatively impact retention in care via poor mental health and ineffective stress management. Additional research examining the mechanism whereby adverse mental health outcomes and coping strategies may influence the associations between anticipated stigma/negative self-image and retention in care outcomes in this population is warranted.

Counter to our hypotheses, we found that increases in personalized stigma were associated with an increased likelihood of being retained in care. The odds of being retained in care were two times higher among those reporting high levels of personalized stigma and 57% higher among those with moderate levels of personalized stigma (compared to low levels). These high rates of retention in care may be due to other confounding factors, including the substantial proportion of participants in the sample using public insurances, specifically, Ryan White HIV/AIDS Program, which has been shown to have very high retention in care rates (Health Resources and Services Administration, 2020). The Health Resources and Services Administration (HRSA) found that those clients who participated in the Ryan White HIV/AIDS Program reached a national level of retention in care of 80.8% and a rate of 81.8% in Florida for 2019. The retention in care rates of Ryan White HIV/AIDS Program participants in the state of Florida was 79.1% (2015), 82.7% (2016), and 81.2% (2017) during the study sample period (Health Resources and Services Administration, 2020). As a result of sampling and recruitment methods, many participants were found to already be receiving care. Therefore, those affected by HIV-related stigma may have already disengaged from care. Nevertheless, our findings suggest that further research is necessary to explore the influence of personalized stigma on retention in care among PLWH in Florida.

Finally, in Aim 3, we assessed HIV-related stigma and viral suppression. The bulk of research evaluating the impact of HIV-related stigma on viral suppression has often been evaluated through decreased ART adherence (Rintamaki et al., 2006; Rueda et al., 2016; Vanable et al., 2006). To the best of our knowledge, this is the first study to examine the difference in the association between HIV-related stigma subtypes and the biological marker of viral suppression among a racial and ethnically diverse sample using participants' last viral load measurement. This adds to the rigor of the present study. Our findings revealed that lower levels of negative self-image and anticipated stigma were associated with an increased likelihood of reaching viral suppression. Specifically, we found that those reporting high levels of negative self-image stigma were 32.7% less likely to be virally suppressed. To a lesser degree, high levels of anticipated stigma were associated with just a 5.7% lower likelihood of viral suppression. Our findings are consistent with a 2018 study of 100 HIV-positive African American women who found that those who experienced higher levels of HIV-related stigma were less likely to be virally suppressed (Lipira et al., 2019). These findings have the potential to inform intervention development as they suggest that any HIV-related stigma reduction interventions in Florida that aim to reduce experiences of negative self-image may also reduce the level of anticipated stigma experienced by PLWH. In 2020, a prospective intervention study was designed for 371 individuals new to HIV care to improve participant information, motivation, and behavioral skills to facilitate their adjustment to living with HIV by reducing internalized stigma (negative self-image). The intervention known as "integrating ENGagement and Adherence Goals upon Entry" (iENGAGE), yielded significant decreases in internalized stigma from baseline to 48 weeks in the intervention arm compared to the control condition (Yigit et al., 2020). Similar interventions designed to improve participant information, motivation, and behavior skills targeting negative self-image and anticipated stigma may result in improvements in viral suppression rates among PLWH in Florida.

Additionally, we found increased levels of personalized stigma were associated with a greater likelihood of viral suppression. Specifically, high and moderate levels of personalized stigma were associated with a 43% and 46.8% greater likelihood of viral suppression, respectively. This counterintuitive finding may also be due to a high percentage of the study sample using public insurances, specifically, Ryan White HIV/AIDS Program, which has been shown to have a very high rate of viral suppression. HRSA found that those clients who participated in the Ryan White HIV/AIDS Program reached a record national viral suppression level of 88.1% and a rate of 86.9% in Florida for 2019. The viral suppression rates of Ryan White HIV/AIDS Program participants in the state of Florida were 82.2% (2015), 83.4% (2016), and 85.0% (2017) during the study sample period (Health Resources and Services Administration, 2020). In part, our rate of viral suppression may be due to the fact that we recruited mostly from clinics. In 2015, MMP revised its methods to include all PLWH, including those in care as well as those who are not receiving HIV care. Therefore, it has enabled researchers to gain awareness of the needs of PLWH not typically included in population samples. Nevertheless, future qualitative and mixed methods research is warranted to explore the positive association between personalized stigma and viral suppression among PLWH in Florida found in the present study.

The covariates assessed across the HIV care continuum yielded trends in our analysis. Participants over the age of 50 were less likely to be linked in care, retained in care, and reach viral suppression. Older adults have been found to be at higher risk of morbidity and other health conditions. Adults over the age of 50 are more likely to be isolated from HIV support groups due to ageism. These groups tend to be younger and may not be as welcoming to older adults (Siegler et al., 2018). Stigmatization may also result in health care providers not paying enough attention to the mental health and sexual health needs of older adults. Current research suggests that the intersection of HIV-related stigma and ageism is a complex issue. Future research should focus on the design and feasibility of implementing stigma reduction interventions addressing HIV-related stigma and ageism (Brown & Adeagbo, 2021). However, the CDC has found that people 55 and older have higher rates of receiving some care, being retained in care, and reaching viral suppression compared to the overall population living with HIV (Centers for Disease Control and Prevention (CDC), 2016). This maybe be due the increased likelihood of doctor visits as well as living through the height of the AIDS crisis and the impact that has been left on this population today (Cahill & Valadéz, 2013; Centers for Disease Control and Prevention (CDC), 2016). Future studies should examine the impact of HIV-related stigma on older adults and develop interventions to address risk factors such as isolation.

Participants who received a high school diploma/GED or less more likely to be linked to care, retained in care, and reach viral suppression. This finding is likely linked to enrollment in the Ryan White HIV/AIDS Program, which has been shown to have very high rates of linkage to care, retention in care and viral suppression (Health Resources and Services Administration, 2020). Non-injection drug use in the last year was also associated with a lower likelihood of engagement across the HIV care continuum. In a study conducted by Wu et al. (2021), injecting drug users had lower prevalence rates of being retained in care and viral suppression compared to non-injecting drug users. It should be noted that our non-injection drug use measure combined the usage of opioids, marijuana, methamphetamine, and cocaine, among others. Future research should examine the unique impact of these drugs, examine distinctions between substance use and substance abuse, as well as the impact of mental health on HIV-related stigma and HIV care continuum outcomes.

Female participants were less likely to be linked to care and reach viral suppression compared to men. However, female participants were only slightly more likely to be retained in care when compared to men. A study conducted by Matson et al. (2018) in a Veterans aging cohort study of 33,224 participants found women were less likely than men to receive HIV care. The predicted prevalence for women and men were 71.9% (95% CI: 69.1-74.7%) and 77.9% (77.5-78.4%) for engagement in care, 60.0% (57.0-

73.14%) and 73.8% (73.4-74.3%) for ART treatment, and 46.4% (43.3-49.6%) and 55.8% (55.3-56.3%) for viral suppression (Matson et al., 2018). This is consistent with our findings and suggests more interventions are needed to improve HIV care among women in Florida.

Racial/Ethnic Disparities in HIV-Related Stigma along the HIV Care Continuum

We examined three interactions to determine whether HIV-related stigma and HIV care continuum outcome differed based on race/ethnicity. Each HIV-related stigma × race/ethnicity interaction was determined to be significant. The non-linear relationship found in the overall sample between HIV-related stigma type and HIV care continuum outcome was also evident when the models were stratified by race/ethnicity.

Aim 1

When stratifying the adjusted model by race/ethnicity in Aim 1 (linkage to care), differences were found on the impact of each HIV-related stigma subtype among non-Hispanic Black, Hispanic, and non-Hispanic White participants. A higher level of anticipated stigma was associated with a decreased likelihood of being linked to care among Hispanics and an increased likelihood of being linked to care among non-Hispanic Blacks and Whites. Hispanics reporting high and moderate levels of anticipated stigma had an 18.4% and 61.3% lower likelihood of being linked to care, respectively. In contrast, non-Hispanic whites and non-Hispanic Blacks were more likely to be linked to care when experiencing anticipated stigma, particularly non-Hispanic blacks who showed a 31.8% higher likelihood of being linked to care when reporting high levels of anticipated stigma. The findings may confirm a high level of resilience exhibited by non-Hispanic Blacks in previous studies. Kim et al. (2020) found that resilience in Black adults is associated with better cardiovascular health. In the case of our study, the adversity faced by PLWH would be experiences associated with HIV-related stigma. Our findings also contradict previous studies showing experiences of anticipated stigma are reported more among non-Hispanic Blacks who were not engaged in care (Eaton et al., 2018). However, a previous investigation on the relationship between perceived community stigma and the utilization of HIV care services among 200 PLWH in Connecticut found that non-Hispanic Black participants with higher perceptions of community stigma were 3.12 times that of non-Hispanic white participants to associate having a caring and supportive case manager ($p<0.05$) (Green et al., 2020). Green et al.'s (2020) findings may help to explain why our study finding of non-Hispanic Blacks reporting anticipated stigma were more likely to be linked to care than non-Hispanic whites. Considering these results, interventions among case managers who serve non-Hispanic Blacks in Florida should emphasize additional training for building relationships with PLWH. By reducing the impact of mechanisms such as stress, depression/anxiety, and interpersonal factors, PLWH relationships with case managers and patient navigators can interrupt the pathway to non-suppression laid out in the HIV Related Stigma Framework. Providing PLWH with resources such as HIV counseling, assistance with insurance, motivational interviewing, and referral to treatment has been demonstrated to improve outcomes along the HIV care continuum (Schumann et al., 2019).

Additionally, high levels of personalized stigma were associated with a higher likelihood of linkage to care among Hispanics and non-Hispanic Blacks. In comparison, high levels of personalized stigma were associated with a lower likelihood of linkage to care among non-Hispanic whites. These findings might be explained when considering findings from a study conducted by Crockett et al. (2019) that suggested greater neighborhood racial diversity may lessen HIV stigma processes at the individual level. Perhaps non-Hispanic Blacks and Hispanics are more likely to encounter other forms of discrimination and may be equipped with additional resilience strategies, social support, and other resources, such as adaptive coping and community empowerment, to manage their experiences with intersectional discrimination, whereas this may not be the case for non-Hispanic whites. An intervention conducted by Bauermeister et al. (2019) used online forums to reduce HIV stigma among 238 young black MSM. HIV stigma was found to decrease over time among forum participants who discussed HIV stigma ($p \leq 0.05$). A similar intervention may be effective among newly diagnosed PLWH to combat the impact of personalized stigma and encourage newly diagnosed persons to seek care.

Moderate levels of personalized stigma (compared to low levels of personalized stigma) were associated with a lower likelihood of linkage to care among non-Hispanic Blacks and Hispanics. These findings are consistent with previous studies showing that Black MSM, who experience personalized (or enacted) stigma, were less likely to receive HIV lab results in the last year and more likely to report a detectable viral load (Brewer, Hood, Moore, et al., 2020). These findings are also important as it relates to intervention development and suggest that interventions in Florida that target non-Hispanic Blacks and Hispanics should address culturally related factors, such as gender norms and religiosity among Hispanics and non-Hispanic Blacks, that have a considerable influence on stigma, treatment, and prevention (Rivera et al., 2021). For instance, previous research has found that among men that adhere strongly to traditional Hispanic gender norms such as machismo, characterized by hypermasculinity, aggressiveness, and dominance, depending on a doctor and taking medication every day may lead to feelings of weakness and symbolize illness ((Arciniega et al., 2008; Galvan et al., 2014). Hispanics beliefs and trust in nontraditional care such as folk healing practices such as curanderismo is also a cultural factor that should be accounted for in addressing improvements along the HIV care continuum (A. A. Sanchez, 2018; Suarez et al., 1996). More research is needed to understand the role of cultural factors among minorities in linkage to HIV care services.

Among cultural factors that should be further explored in the non-Hispanic Black community is religiosity as it relates to HIV stigma and subsequent HIV-related health outcomes. A study conducted by Payne-Foster et al. (2018), found that non-Hispanic Black churches could have a substantial impact on HIV stigma reduction. The Project Faith-based Anti-stigma Initiative towards Healing HIV (FAITHH) intervention occurred at 12 non-Hispanic Black churches in rural Alabama and had 199 adult participants (Payne-Foster et al., 2018). A comparative study examined the effectiveness of an eight-module intervention designed to educate participants about HIV facts, discuss the detrimental effects of HIV-related stigma, promote action to prevent HIV-related stigma, and advocate for PLWH (Payne-Foster et al., 2018). Researchers compared participants in the FAITHH intervention with those in a knowledge-based group and a control group who received brochures about HIV facts and faith-related messages. The results showed a significant reduction in HIV-stigma in the FAITHH group compared to the control group (Payne-Foster et al., 2018). Faith-based interventions have not been as effective among Hispanic populations, perhaps due to hesitance by Catholic churches to discuss such sensitive issues. Notably, there has been a recent shift away from Catholicism among Hispanics which may open to door to exploring religious institutions as a means of conducting community-based outreach as a means of decreasing HIV stigma in this population (Pew Research Center, 2014). Previous studies have found that churches serve as a strong source of social capital and a safe haven, particularly among marginalized and vulnerable Hispanic subgroups such as undocumented immigrants (Sanchez et al., 2019). Future faith-based interventions to decrease HIV-related stigma within Hispanic churches could potentially yield similar results as those in non-Hispanic Black churches.

The third key finding from Aim 1 concerning race/ethnicity is the impact of negative self-image. Greater negative self-image was associated with a higher likelihood of linkage to care among non-Hispanic whites and non-Hispanic Blacks, with no significant associations among Hispanics. Negative self-image as a protective factor may be linked with coping mechanisms among non-Hispanic whites and non-Hispanic Blacks. Future research should assess the relationship among coping mechanisms and linkage to care among Hispanics, non-Hispanic whites, and non-Hispanic Blacks. Previous studies have found associations between increased levels of negative self-image and lower levels of self-esteem are mitigated by engagement coping levels (Varni et al., 2012). Engagement coping refers to efforts put into engaging with the source of stress and enhancing a sense of personal control over the situation and/or adapting to it (Varni et al., 2012). Thus, the seemingly protective association of negative self-image may be due to engagement coping, which was not measured in the present study. Future studies should investigate the race/ethnicity differences in engagement coping and negative self-image on linkage to HIV care. These findings could also be a result of misclassifications in our linkage to care analysis. Our record of the participant's first medical appointment following a diagnosis may be inaccurate given that eHARS only keeps track of laboratory tests conducted in Florida.

Aim 2

When assessing differences across race/ethnicity in Aim 2 (retention in care), differences were found on the impact of each HIV-related stigma subtype among non-Hispanic Black, Hispanic, and non-Hispanic White participants. Particularly, Hispanics with high levels of negative self-image were seven times more likely to be retained in care. Conversely, non-Hispanic Blacks with high negative self-image were a 34.9% less likelihood of being retained in HIV care. A possible explanation for such a large discrepancy between Hispanics and non-Hispanic Blacks may be related to the substantial amount of non-Hispanic Blacks with HIV that originate from Haiti in South Florida. In contrast, Hispanics living with HIV in South Florida originate predominantly from Cuba. The immigrant experience is quite different between these two groups. While Cuban immigrants have benefited from social services and access to health care, Haitian immigrants are often not eligible for these services due to distinction in U.S. immigration policies between these two Caribbean nations (Cyrus et al., 2017; Migration Policy Institute, 2020; Sheehan et al., 2015).

Furthermore, Haitians are among the four groups who were unfairly stigmatized by the CDC in 1983 for being at risk for HIV/AIDS. Haitians, hemophiliacs, homosexuals, and heroin users were collectively referred to as the “4H club”. Despite studies demonstrating that Kaposi's sarcoma and opportunistic infections, HIV/AIDS complications, were not indigenous to Haiti, medical professionals claimed that HIV infection originated from Haiti (Farmer, 2004). Several health officials have stated Haitians are 'infected' and only bring tuberculosis and HIV into the United States (Fouron, 2013). In 1983, the Centers for Disease Control and Prevention requested that the Red Cross and other hospitals screen donors and not allow blood donations from members of the 4H Club (Fouron, 2013). Initially, the ban did not apply to Haitian immigrants after 1977, but in February 1990, the Food and Drug Administration made the ban applicable to all Haitians (Fouron, 2013). This stigmatization has served to proliferate anti-Haitian sentiment especially as it relates to HIV infection and may likely exacerbate negative self-image among HIV-positive Haitians in South Florida. Using the HIV-related stigma framework, we can determine how the intersectional stigma associated with being Haitian and living with HIV, in conjunction with structural stigma experiences such as beliefs within society and laws, can increase the level of internalized stigma (negative self-image). As a result, mental health is compromised, and coping mechanisms are impaired, ultimately resulting in people dropping out of care.

Another key finding from Aim 2 concerning race/ethnicity is that non-Hispanic white, non-Hispanic black, and Hispanic participants who experience personalized stigma are more likely to remain in care. A study of 932 PLWH in Florida found that racial minorities have lower odds of experiencing personalized stigma (Algarin et al., 2019). However, among non-Hispanic whites, high levels of personalized stigma were associated with six times greater likelihood of being retained in care. Additionally, reporting high levels of personalized stigma among Hispanics and non-Hispanic Blacks were associated with an increased likelihood of remaining in care. Given the present study findings that personalized stigma serves as a protective factor for patients from dropping out of health care, the study by Algarin et al. may explain why Hispanics and non-Hispanic Blacks who reported high levels of personalized stigma were more likely to be retained in care. In addition, our sample included many participants who were already receiving treatment. Several of whom received assistance through the Ryan White HIV/AIDS program, whose recipients are mostly Hispanics and non-Hispanic Blacks (Health Resources and Services Administration, 2020).

Non-Hispanic Whites, non-Hispanic Blacks and Hispanics reporting high and moderate levels of anticipated stigma were less likely to be retained in care compared to those with low levels of anticipated sigma. These findings are consistent with previous studies that stress the importance of HIV-related stigma as a barrier to retention and engagement in care (Kalichman et al., 2020). Notably, previous evidence suggests that retention in care could potentially be improved among Hispanics using patient navigators and community health works (Rios-Ellis et al., 2015). An intervention involving HIV-positive and HIV-affected community health workers was developed to reduce HIV-related stigma among underserved Hispanics in the Southwest U.S. (Rios-Ellis et al., 2015). Community health workers, or "promotores de salud," proved to be an effective and culturally acceptable way of reaching Hispanics by providing an interactive, group-based educational session in both English and Spanish to groups of Hispanics. The investigation found a significant reduction in HIV-related stigma from pre- to post-test (Rios-Ellis et al., 2015). Interventions such as this highlight the importance of integrating culturally relevant strategies in Florida to reduce HIV-related stigma and improve rates of linkage to care, retention in care, and viral suppression among communities of color.

Our findings also revealed that among non-Hispanic Blacks the impact of anticipated stigma plateaued. The impact of high and moderate levels of anticipated stigma had the same magnitude in the likelihood of retention in care in comparison to low levels of anticipated stigma. These findings are consistent with a case-control study conducted in Lima, Peru, in 2015, using cases that were out of care for at least one year (n=66) and controls who were active care (n=110) (Valenzuela et al., 2015). However, the study found a non-linear association with personalized stigma, negative self-image, and retention in care. Valenzuela and colleagues found the association with being out of care plateaued at higher levels of personalized stigma and declined at higher levels of negative self-image (Valenzuela et al., 2015). The researcher attributed these results to possible response bias at higher levels of stigma and claimed participants might report being in care "to appear as "normal" as possible by concealing their condition to avoid future discrimination" (Valenzuela et al., 2015). Due to our study's use of data abstractions from documented HIV clinical visits to confirm retention in care, and the fact that in Florida HIV lab tests must be reported, it is unlikely that participants would be able to conceal their HIV status. Future research should include a qualitative and mixed-methods approach to better understand the non-linear relationship between HIV-related stigma and retention in care found in this and the previously mentioned quantitative studies.

Aim 3

Study findings also revealed differences in the association between HIV-related stigma subtype and viral suppression across non-Hispanic Black, Hispanic, and non-Hispanic White participants. Specifically, personalized stigma was associated with an increased likelihood of being virally suppressed among non-Hispanic whites, and to a lesser degree, among non-Hispanic Blacks. However, personalized stigma was associated with a 52% decreased likelihood of reaching viral suppression among Hispanics. The intersectional stigma experienced by Hispanics due to ethnicity and HIV status may be exacerbated by personalized stigma. The HIV-related Stigma Framework suggests that personalized (enacted) stigma may impact interpersonal factors. Among Hispanic men with high traditional machismo, their experiences of personalized stigma may influence low medication adherence due to the wishful coping styles. Previous studies suggest that when Hispanic men are high in machismo, taking medication every day can be a constant reminder of illness, the exacerbate feelings of weakness, and being outcasted (Galvan et al., 2014).

The 2020 study conducted by Algarin et al. of 932 PLWH in Florida found that experiencing healthcare-specific personalized (enacted) stigma was associated with not reaching viral suppression (AOR = 2.16, CI: (1.19–3.92), p = 0.011) (Algarin et al., 2020). However, Algarin and colleagues study found no association between the impact of general personalized stigma and viral suppression. This study also did not find differences in personalized stigma’s impact on race/ethnicity. Our study is the first to document a significant impact of personalized stigma on viral suppression and the first to find differences in the impact of personalized stigma on achieving viral suppression among a diverse statewide sample of PLWH in Florida.

In our study, anticipated stigma and negative self-image impacted viral suppression in the same direction. Additionally, anticipated stigma reported by Hispanics showed to be a protective factor for reaching viral suppression. In contrast, anticipated stigma at both high and moderate levels showed to be a substantial risk factor among non-Hispanic whites having detectable viral loads and not reaching viral suppression. While high levels of anticipated stigma were not significantly associated with viral suppression among non-Hispanic Blacks, moderate levels of anticipated stigma were shown to have a slight protective effect. This finding is consistent with previous studies indicating overall lower rates of viral suppression among non-Hispanic Blacks, with higher levels of HIV-related stigma linked to lower rates of viral suppression in this racial/ethnic group (Christopoulos et al., 2020).

Negative self-image among Hispanics was also found to play a protective role in reaching viral suppression. Conversely, non-Hispanic whites and non-Hispanic Blacks reporting high levels of negative self-image had a 41% and 59% decreased likelihood of attaining viral suppression, respectively. Although Hispanics experience similar psychosocial and physical health challenges such as the structural and intersectional stigma previously mentioned, the impact of anticipated stigma and negative self-image on viral suppression seems to follow an epidemiological phenomenon commonly referred to as the Hispanic Health Paradox. The Hispanic Health Paradox posits that despite the experiences of societal pressures, Hispanics generally experience better physical health and lower mortality than non-Hispanic whites (Ruiz et al., 2016). Future research employing mixed-method approaches are needed to further explore the relationship between anticipated stigma and negative self-image on viral suppression among Hispanics to understand if stigma is indeed protective or if there are other confounding factors not accounted for in the present study that may explain these associations.

Strengths and Limitations

The present study has numerous strengths, including a representative sample of the Florida population living with HIV. Our study spans four years, including people living with HIV/AIDS in Florida from June 2015 to May 2018. To the best of our knowledge, no prior study has used multiple HIV-related stigma subtypes to study the difference between non-Hispanic Black, Hispanic, and non-Hispanic White PLWH and their associations with linkage to care, retention in care, and viral suppression in the MMP survey. Another strength of this study is the use of clinical indicators to define our outcomes such as laboratory-reported viral load measurements rather than self-reported adherence.

Findings from this investigation should be interpreted in light of its limitations. First, the present study used a cross-sectional design. Given the cross-sectional nature of the data, the causal or direction order of the associations found cannot be implied. Secondly, 139 unweighted participants were omitted from our study because of incomplete data. This mostly related to variables such as: household income (62 unweighted observations), race/ethnicity (33), anticipated stigma (28), and health insurance (24). Many of the omitted participants missed multiple data points. We also excluded respondents that identified as transgender due to the small sample size. Future studies should include larger sample sizes of transgender persons when examining the relationship of HIV-related stigma on HIV continuum outcomes. Thirdly, many measures were self-reported, which introduces the possibility of recall and social desirability bias. As the survey design and modeling techniques for the Florida MMP were improved every year, the information received from respondents in our study is likely to be more accurate than that of respondents who responded in earlier years of the study. The recruitment sites used in the collection of data may have biased our sample in oversampling people in care and under-sample those who are not in care. Nevertheless, in 2015 MMP expanded its target population to all HIV-diagnosed individuals, whether they are receiving HIV treatment and care or not. This allowed MMP to better monitor and guide efforts to prevent HIV infection and its clinical outcomes via available treatment and other clinical interventions (Centers for Disease Control and Prevention, 2015b).

We previously reported that only 34.1% of the study population had been linked to care within 30 days of diagnosis between June 2015 and May 2018. Our sample shows a lower rate of linkage to care than the 67.0% (2015), 69.6% (2016), 74.8% (2017) reported by the Florida Department of Health for the sample years (Florida Department of Health, 2019). It is possible that many of the sample participants were not diagnosed with HIV in Florida but in other states or perhaps other countries before they immigrated to the United States. As such, a misclassification may have occurred regarding participant's first medical encounter after diagnosis given that eHARS only captures laboratory tests conducted in Florida. Furthermore, 60% of the participants in our study are older than 50 years of age and may have been diagnosed before current treatment models were implemented. In light of the fact that the protocol of linking new diagnoses to care within 30 days is still very new, it is also possible many of our participants might have been linked to care under the old criteria of within 90 days after diagnosis (The White House, 2015).

Additionally, the binge drinking variable used in the present study underestimates the level of binge drinking for females. Four or more alcoholic beverages consumed in one sitting is considered binge drinking among females, while the present study utilized five or more drink cutoff to assess binge drinking (Centers for Disease Control and Prevention, 2014).

There were also limitations associated with our HIV-related stigma variables. In assessing racial and ethnic differences in HIV-related stigma, it is important to consider cultural factors, as attitudes towards HIV can be influenced by cultural views of those living with HIV. Future research should include cultural factors in assessing racial and ethnic differences in HIV-related stigma.

Despite these limitations, this is the first study to assess the difference in the impact that personalized stigma, negative self-image, and anticipated stigma have on key HIV care continuum outcomes and assess the racial and ethnic differences in these associations. The study was conducted with a diverse sample in a state with one of the highest incidence rates of HIV in the United States. The sample used in this study was weighted to represent the state of Florida from June 2015 to May 2018. In addition, the study utilized medical record data (e.g., HIV lab tests/documentation of two or more episodes of engagement in HIV care/viral load measurements) to eliminate potential bias in the HIV care continuum outcomes.

Future Directions

Given the cross-sectional nature of the present study, future longitudinal research is needed to assess the impact of personalized stigma, negative self-image, and anticipated stigma on HIV continuum outcomes over time. Future studies should include larger sample sizes of transgender persons when examining the relationship of HIV-related stigma on HIV continuum outcomes, given the growing research on the disparities in treatment and care in this population.

There is also a need for future research to focus on how distinct stigma types may function as mediators or moderators of HIV outcomes across the HIV continuum. In a recent study, Turan et al. (2017) tested a serial mediation model demonstrating that perceived community stigma leads to internalized stigma, which in turn leads to anticipated community stigma, which in turn leads to low medication adherence. Future research should also examine how stigma mechanisms may mediate the effects of other stigma mechanisms, their effects across the HIV continuum, and how these associations may vary across race and ethnicity.

There is also a need for research that focuses on gaining a better understanding of the sources of stigma experienced by PLWH (Kemp et al., 2019). Based on previous research, HIV stigma originating from family members and acts of overt discrimination were the most frequently experienced sources of stigma and were most closely associated with disengagement from HIV care (Kalichman et al., 2020). Given that the majority of our sample was over the age of 50, future studies should also examine the impact of HIV-related stigma on older adults and develop interventions to address isolation and ageism. The intersectionality of ageism and HIV stigma is an important public health challenge facing the aging population in Florida and warrants further examination. A recent study by Brown et al. suggests interventions dedicated to improving social support and reducing social isolation among older people living with HIV would have a substantial impact on sustaining the gains of the global investment in the HIV care continuum (Brown & Adeagbo, 2021).

Our study found a positive association between personalized stigma and viral suppression among PLWH in Florida. Previous studies have found experiencing healthcare-specific enacted HIV-related stigma was associated with both poor adherence to ART and not reaching viral suppression (Algarin et al., 2020). Nonetheless, recent research suggests that higher levels of patient-provider engagement may reduce the impact internalized stigma has on patient retention in HIV care (Valverde et al., 2018). Mixed-method research is needed to explore the relationship between HIV-related stigma subtypes and viral suppression among PLWHs in Florida.

Additionally, our non-injection drug use measure combined the usage of opioids, marijuana, methamphetamine, and cocaine, among others. A recent study found methamphetamine use was associated with decreased viral suppression among 356 PLWH who were recently released from jail (Goodman-Meza et al., 2019). Future research should examine the unique impact of these drugs on HIV-related stigma and HIV care continuum outcomes.

There is also a need to assess the relationship between coping and resilience mechanisms and the HIV care continuum across racial/ethnic groups. A study conducted by Brewer et al. found that compared to White MSM, Black MSM who reported being impacted more by personalized stigma had poorer HIV care outcomes, specifically length of time since last HIV care visit, time since last HIV lab result, and most recent HIV viral load result. However, higher levels of resilience among Black MSM were associated with less time since the last HIV care visit compared to White MSM (Brewer, Hood, Moore, et al., 2020). Future interventions aimed to improve resilience and mental health may be a particularly effective intervention strategy among non-Hispanic Blacks MSM (Blashill et al., 2011; Brewer, Hood, Hotton, et al., 2020).

Future faith-based interventions to decrease HIV-related stigma within Hispanic churches could also potentially yield similar results that have been found among non-Hispanic Black churches. Recent studies have begun to use congregation-based HIV interventions that include more diverse populations, including Hispanics, whereas previous research has overwhelmingly partnered with majority African American congregations (Derose et al., 2014). Previous studies have highlighted the success of patient and peer navigators in increasing positive HIV health outcomes among non-Hispanic Blacks and Hispanics (Cunningham et al., 2018; Derose et al., 2014; Gwadz et al., 2017; Shacham et al., 2018; Tucker et al., 2017). Shacham et al. (2018) employed a community- and clinical-based intervention with 332 participants (majority African American) that included intensive case management, access to community nurses, and peer navigator support to increase engagement and retention in HIV care through at least six months. Future interventions should use peer and patient navigators in the formation of culturally acceptable interventions in the reduction of HIV-related stigma and in the improvement in health outcomes across the HIV care continuum.

Traditional Hispanic folk beliefs and practices, often called curanderismo, are an important cultural factor when addressing health and healing in this community (A. A. Sanchez, 2018). The belief in folk healing among Hispanic is another important area worthy of future investigation. Studies have shown many Hispanics depend on folk healing for physical relief, spiritual relief, protection from evil spirits, and belief that folk healing will cure them of HIV (Suarez et al., 2010). Further exploration into how these cultural beliefs and practices impact HIV stigma and outcomes should be further explored. Additionally, interventions that emphasize educating health care providers on these nontraditional forms of healing, which can be used alongside other traditional HIV treatment options, may improve Hispanics' rates of HIV treatment across the continuum.

Florida's diversity presents an opportunity for future research involving ethnic subgroups. As an example, this study examines Hispanics and non-Hispanic Blacks as homogenous groups, when, there is substantial heterogeneity within Hispanic and non-Hispanic Black subgroups and their experiences. For instance, Cuban immigrants have benefited from access to social services and healthcare that Haitian immigrants have not been eligible to access. Cuban immigrants have also benefited from services that Mexican immigrants have not received despite both subgroups being classified as Hispanics (Cyrus et al., 2017; Horton, 2004; Migration Policy Institute, 2020; Sheehan et al., 2015). The same is true for non-Hispanic Blacks. Black Caribbean-born immigrants from countries such as Jamaica, Haiti, Bahamas, and Trinidad and Tobago, as well as African Americans, have cultural differences and varying access to social program benefits such as Medicaid which provides healthcare services to U.S. citizens who are most in need. Conversely, Black Caribbean-born immigrants are most often not granted access to these services until they are granted citizenship (Migration Policy Institute, 2020). However, researchers have found that non-U.S.-born Blacks achieve significantly better HIV care outcomes despite being more likely to receive a delayed HIV diagnosis (Demeke et al., 2018). Future research should evaluate the differences in HIV care outcomes between African Americans and Black Caribbean immigrants in Florida as well as determine whether cultural differences between these groups might explain these differences.

Public Health Implications

This study examined the HIV care continuum outcomes in a racially and ethnically diverse population of Florida, a state with particularly high rates of HIV transmission. Findings from this study can lay the groundwork for a better understanding of the existing racial disparities along the HIV care continuum. State, local government, and health officials may utilize the findings of this investigation to inform the development of culturally relevant HIV stigma interventions among PLWH in Florida. In order to close the gaps along the HIV care continuum and realize the 90-90-90 goal set by UNAIDS and NHS, public health researchers, governmental officials, hospitals, and community activists must address the differential impact and consequences HIV-related stigma can have on people of color along the HIV care continuum. Overall, the development of culturally appropriate interventions to eliminate HIV-related stigma is key to improving rates of linkage to care, retention in care, and viral suppression in Florida across all racial and ethnic groups.

References:

Algarin, A. B., Sheehan, D. M., Varas-Diaz, N., Fennie, K. P., Zhou, Z., Spencer, E. C., Cook, R. L., Morano, J. P., & Ibanez, G. E. (2020). Health Care-Specific Enacted HIV-Related Stigma's Association with Antiretroviral Therapy Adherence and Viral Suppression among People Living with HIV in Florida. *AIDS Patient Care and STDs*, *34*(7), 316–326. https://doi.org/10.1089/apc.2020.0031

Algarin, A. B., Sheehan, D. M., Varas-Diaz, N., Fennie, K., Zhou, Z., Spencer, E. C., Cook, C. L., Cook, R. L., & Ibanez, G. E. (2021). Enacted HIV-Related Stigma's Association with Anxiety & Depression Among People Living with HIV (PLWH) in Florida. *AIDS and Behavior*, *25*(1), 93–103. https://doi.org/10.1007/s10461-020-02948-5

Algarin, A. B., Zhou, Z., Cook, C. L., Cook, R. L., & Ibañez, G. E. (2019). Age, Sex, Race, Ethnicity, Sexual Orientation: Intersectionality of Marginalized-Group Identities and Enacted HIV-Related Stigma Among People Living with HIV in Florida. *AIDS and Behavior*, *23*(11), 2992–3001. https://doi.org/10.1007/s10461-019-02629-y

Allgood, K. L., Hunt, B., & Rucker, M. G. (2015). Black:White disparities in HIV mortality in the united states: 1990–2009. *Journal of Racial and Ethnic Health Disparities*, *3*(1), 168–175. https://doi.org/10.1007/s40615-015-0141-8

Bauermeister, J. A., Muessig, K. E., LeGrand, S., Flores, D. D., Choi, S. K., Dong, W., Sallabank, G., & Hightow-Weidman, L. B. (2019). HIV and Sexuality Stigma Reduction Through Engagement in Online Forums: Results from the HealthMPowerment Intervention. *AIDS and Behavior*, *23*(3), 742–752. https://doi.org/10.1007/s10461-018-2256-5

Bayer, R. (2008). Stigma and the ethics of public health: Not can we but should we. *Social Science and Medicine*, *67*(3), 463–472. https://doi.org/10.1016/j.socscimed.2008.03.017

Beer, L., Johnson, C. H., Fagan, J. L., Frazier, E. L., Nyaku, M., Craw, J. A., Sanders, C. C., Luna-Gierke, R. E., & Shouse, R. L. (2019). A national behavioral and clinical surveillance system of adults with diagnosed HIV (the Medical Monitoring Project): Protocol for an annual cross-sectional interview and medical record abstraction survey. *JMIR Research Protocols*, *8*(11), 1–8. https://doi.org/10.2196/15453

Beer, L., Mattson, C. L., Bradley, H., & Skarbinski, J. (2016). Understanding cross-sectional racial, ethnic, and gender disparities in antiretroviral use and viral suppression among HIV patients in the United States. *Medicine (United States)*, *95*(13), e3171. https://doi.org/10.1097/MD.0000000000003171

Bennett, D. S., Hersh, J., Herres, J., & Foster, J. (2016). HIV-Related Stigma, Shame, and Avoidant Coping: Risk Factors for Internalizing Symptoms Among Youth Living with HIV? *Child Psychiatry and Human Development*. https://doi.org/10.1007/s10578-015-0599-y

Bing, E. G., Burnam, M. A., Longshore, D., Fleishman, J. A., Sherbourne, C. D., London, A. S., Turner, B. J., Eggan, F., Beckman, R., Vitiello, B., Morton, S. C., Orlando, M., Bozzette, S. A., Ortiz-Barron, L., & Shapiro, M. (2001). Psychiatric disorders and drug use among human immunodeficiency virus-infected adults in the United States. *Archives of General Psychiatry*, *58*(8), 721–728. https://doi.org/10.1001/archpsyc.58.8.721

Blashill, A. J., Perry, N., & Safren, S. A. (2011a). Mental health: A focus on stress, coping, and mental illness as it relates to treatment retention, adherence, and other health outcomes. *Current HIV/AIDS Reports*. https://doi.org/10.1007/s11904-011-0089-1

Blashill, A. J., Perry, N., & Safren, S. A. (2011b). Mental health: A focus on stress, coping, and mental illness as it relates to treatment retention, adherence, and other health outcomes. *Current HIV/AIDS Reports*, *8*(4), 215–222. https://doi.org/10.1007/s11904-011-0089-1

Branson, B. M., Handsfield, H. H., Lampe, M. A., Janssen, R. S., Taylor, A. W., Lyss, S. B., & Clark, J. E. (2006). Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. *MMWR. Recommendations and Reports: Morbidity and Mortality Weekly Report. Recommendations and Reports / Centers for Disease Control*, *55*(RR-14). https://doi.org/10.1016/j.annemergmed.2007.03.001

Brewer, R., Hood, K. B., Hotton, A., Moore, M., Spieldenner, A., Daunis, C., Mukherjee, S., Sprague, L., Schneider, J. A., Smith-Davis, M., Brown, G., & Bowen, B. (2020). Associations Between Experienced HIV Stigma, Resulting Consequences, and the HIV Care Continuum: Moderating Effects of Two Resilience Characteristics Among Persons Living with HIV (PLWH) in Louisiana. *Journal of Racial and Ethnic Health Disparities*, 1. https://doi.org/10.1007/s40615-020-00925-1

Brewer, R., Hood, K. B., Moore, M., Spieldenner, A., Daunis, C., Mukherjee, S., Smith-Davis, M., Brown, G., Bowen, B., & Schneider, J. A. (2020). An Exploratory Study of Resilience, HIV-Related Stigma, and HIV Care Outcomes Among Men who have Sex with Men (MSM) Living with HIV in Louisiana. *AIDS and Behavior*, *24*(7), 2119–2129. https://doi.org/10.1007/s10461-020-02778-5

Brown, M. J., & Adeagbo, O. (2021). HIV and Aging: Double Stigma. *Current Epidemiology Reports*, *8*(2), 72–78. https://doi.org/10.1007/s40471-021-00265-6

Brown, M. J., Serovich, J. M., Laschober, T. C., & Kimberly, J. A. (2018). Age and racial disparities in substance use and self-reported viral suppression among men who have sex with men with HIV. *International Journal of STD and AIDS*, *29*(12), 1174–1182. https://doi.org/10.1177/0956462418779663

Buchacz, K., Chen, M. J., Parisi, M. K., Yoshida-Cervantes, M., Antunez, E., Delgado, V., Moss, N. J., & Scheer, S. (2015). Using HIV surveillance registry data to re-link persons to care: The RSVP project in San Francisco. *PLoS ONE*, *10*(3). https://doi.org/10.1371/journal.pone.0118923

Cahill, S., & Valadéz, R. (2013). Growing older with HIV/AIDS: New public health challenges. *American Journal of Public Health*, *103*(3), 7–15. https://doi.org/10.2105/AJPH.2012.301161

Centers for Disease Control and Prevention. (2014a). Monitoring Selected National HIV Prevention and Care Objectives by Using HIV Surveillance Data—United States and 6 Dependent Areas—2012. HIV Surveillance Report Supplementa Report 19(3). In *HIV Surveillance Supplemental Report* (Vol. 25, Issue 2). http://www.cdc.gov/hiv/library/reports/hiv-surveillance.html.http://www.cdc.gov/hiv/library/reports/hiv-surveillance.html

Centers for Disease Control and Prevention. (2014b). Alcohol Use and Your Health. In *Fact Sheet CDC*. https://www.cdc.gov/alcohol/fact-sheets/alcohol-use.htm

Centers for Disease Control and Prevention. (2015a). *HIV Infection: Detection, Counseling, and Referral - 2015 STD Treatment Guidelines*. Centers for Disease Control and Prevention. https://www.cdc.gov/std/tg2015/hiv.htm

Centers for Disease Control and Prevention. (2015b). *Medical Monitoring Project Protocol 2015-2017 Data Collection Cycles*.

Centers for Disease Control and Prevention. (2016). *CDC FACT SHEET Today's HIV/AIDS Epidemic The Scope and Impact of HIV in the United States*.

Centers for Disease Control and Prevention. (2019a). *HIV in the Southern United States*. http://www.cdc.gov/

Centers for Disease Control and Prevention. (2019b). *HIV Infection Risk, Prevention, and Testing Behaviors Among Men Who Have Sex With Men—National HIV Behavioral Surveillance, 23 U.S. Cities, 2017*.

Centers for Disease Control and Prevention. (2019c). *HIV Prevention - Florida*. http://www.floridahealth.gov/diseases-and-conditions/aids/surveillance/index.html

Centers for Disease Control and Prevention. (2019d). *STDs in Men Who Have Sex with Men - 2018 Sexually Transmitted Diseases Surveillance*. https://www.cdc.gov/std/stats18/msm.htm

Centers for Disease Control and Prevention. (2019e). *Understanding the HIV Care Continuum*. https://www.cdc.gov/hiv/pdf/library/factsheets/

Centers for Disease Control and Prevention. (2020a). *HIV in the United States and Dependent Areas | Statistics Overview | Statistics Center | HIV/AIDS | CDC*. https://www.cdc.gov/hiv/statistics/overview/ataglance.html

Centers for Disease Control and Prevention. (2020b). *HIV and Gay and Bisexual Men*. www.cdc.gov/hiv/library/reports/hiv-surveillance.html

Centers for Disease Control and Prevention. (2020c, September 14). *African Americans | Health Disparities | NCHHSTP | CDC*. https://www.cdc.gov/nchhstp/healthdisparities/africanamericans.html

Centers for Disease Control and Prevention. (2020d). *HIV and Hispanic/Latinos*. www.cdc.gov/hiv

Centers for Disease Control and Prevention. (2021a). *Basic Statistics | HIV Basics | HIV/AIDS | CDC*. https://www.cdc.gov/hiv/basics/statistics.html

Centers for Disease Control and Prevention. (2021b). *Estimated HIV incidence and prevalence in the United States, 2015–2019* (Vol. 26, Issue 1). https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-supplemental-report-vol-26-1.pdf

Centers for Disease Control and Prevention. (2021c). *HIV and African Americans*. www.cdc.gov/hiv

Centers for Disease Control and Prevention. (2021d). *NCHHSTP AtlasPlus - Maps*. https://gis.cdc.gov/GRASP/NCHHSTPAtlas/maps.html

Centers for Disease Control and Prevention (CDC). (2016, August 9). *HIV Among People Aged 50 and Over*. https://www.cdc.gov/hiv/group/age/olderamericans/index.html

Centers for Disease Control and Prevention, & Health Resources and Services Administration. (2016). *2017-2021 CDC/HRSA INTEGRATED HIV/AIDS PREVENTION AND CARE PLAN MIAMI-DADE COUNTY, FLORIDA*.

Centers of Disease Control and Prevention. (2014). *Understanding the HIV Care Continuum*.

Chang, D. (2019, June 17). Florida, CDC partner up to end HIV epidemic | Miami Herald. *Miami Herald*. https://www.miamiherald.com/news/health-care/article231561473.html

Christopoulos, K. A., Neilands, T. B., Dilworth, S., Lisha, N., Sauceda, J., Mugavero, M. J., Crane, H. M., Fredericksen, R. J., Mathews, W. C., Moore, R. D., Mayer, K. H., Napravnik, S., & Johnson, M. O. (2020). Internalized HIV stigma predicts subsequent viremia in US HIV patients through depressive symptoms and antiretroviral therapy adherence. *AIDS (London, England)*, *34*(11), 1665–1671. https://doi.org/10.1097/QAD.0000000000002595

Crepaz, N., Dong, X., Hess, K. L., & Bosh, K. (2020). Brief Report: Racial and Ethnic Disparities in Sustained Viral Suppression and Transmission Risk Potential Among Persons Aged 13-29 Years Living With Diagnosed HIV Infection, United States, 2016. *Journal of Acquired Immune Deficiency Syndromes (1999)*, *83*(4), 334–339. https://doi.org/10.1097/QAI.0000000000002277

Crepaz, N., Dong, X., Wang, X., Hernandez, A. L., & Hall, H. I. (2018). Racial and Ethnic Disparities in Sustained Viral Suppression and Transmission Risk Potential Among Persons Receiving HIV Care — United States, 2014. *MMWR. Morbidity and Mortality Weekly Report*, *67*(4), 113–118. https://doi.org/10.15585/mmwr.mm6704a2

Crepaz, N., Tang, T., Marks, G., Mugavero, M. J., Espinoza, L., & Hall, H. I. (2016). Durable Viral Suppression and Transmission Risk Potential among Persons with Diagnosed HIV Infection: United States, 2012-2013. *Clinical Infectious Diseases*, *63*(7), 976–983. https://doi.org/10.1093/cid/ciw418

Crockett, K. B., Edmonds, A., Johnson, M. O., Neilands, T. B., Kempf, M. C., Konkle-Parker, D., Wingood, G., Tien, P. C., Cohen, M., Wilson, T. E., Logie, C. H., Sosanya, O., Plankey, M., Golub, E., Adimora, A. A., Parish, C., Weiser, S. D., Turan, J. M., & Turan, B. (2019). Neighborhood Racial Diversity, Socioeconomic Status, and Perceptions of HIV-Related Discrimination and Internalized HIV Stigma among Women Living with HIV in the United States. *AIDS Patient Care and STDs*, *33*(6), 270–281. https://doi.org/10.1089/apc.2019.0004

Cunningham, T. J., Croft, J. B., Liu, Y., Lu, H., Eke, P. I., & Giles, W. H. (2017). Vital Signs: Racial Disparities in Age-Specific Mortality Among Blacks or African Americans — United States, 1999–2015. *MMWR. Morbidity and Mortality Weekly Report*, *66*(17), 444–456. https://doi.org/10.15585/mmwr.mm6617e1

Cunningham, W. E., Weiss, R. E., Nakazono, T., Malek, M. A., Shoptaw, S. J., Ettner, S. L., & Harawa, N. T. (2018). Effectiveness of a peer navigation intervention to sustain viral suppression among HIV-positive men and transgender women released from jail the LINK la randomized clinical trial. *JAMA Internal Medicine*, *178*(4), 542–553. https://doi.org/10.1001/jamainternmed.2018.0150

Cyrus, E., Dawson, C., Fennie, K. P., Sheehan, D. M., Mauck, D. E., Sanchez, M., Maddox, L. M., Trepka, M. J., Braithwaite, R. L., De, M., Rosa, L., & Smith, S. A. (2017). Disparity in Retention in Care and Viral Suppression for Black Caribbean-Born Immigrants Living with HIV in Florida. *International Journal of*

Environmental Research and Public Health Article. https://doi.org/10.3390/ijerph14030285

Cyrus, E., Sheehan, D. M., Fennie, K., Sanchez, M., Dawson, C. T., Cameron, M., Maddox, L., & Trepka, M. J. (2018). Delayed Diagnosis of HIV among Non-Latino Black Caribbean Immigrants in Florida 2000-2014. *Journal of Health Care for the Poor and Underserved*, *29*(1), 59. https://doi.org/10.1353/hpu.2018.0019

Dang, B. N., Westbrook, R. A., Hartman, C. M., & Giordano, T. P. (2016). Retaining HIV Patients in Care: The Role of Initial Patient Care Experiences. *AIDS and Behavior*, *20*(10), 2477–2487. https://doi.org/10.1007/s10461-016-1340-y

Davtyan, M., Olshansky, E. F., Brown, B., & Lakon, C. (2017). A Grounded Theory Study of HIV-Related Stigma in U.S.-Based Health Care Settings. *Journal of the Association of Nurses in AIDS Care*, *28*(6), 907–922. https://doi.org/10.1016/j.jana.2017.07.007

Dawson, L., & Kates, J. (2020, September 24). *Insurance Coverage and Viral Suppression Among People with HIV, 2018 | KFF*. Henry J. Kaiser Family Foundation. https://www.kff.org/hivaids/issue-brief/insurance-coverage-and-viral-suppression-among-people-with-hiv-2018/

Demeke, H. B., Johnson, A. S., Zhu, H., Gant, Z., Duffus, W. A., & Dean, H. D. (2018). Hiv infection-related care outcomes among U.S.-Born and Non-U.S.-Born blacks with diagnosed HIV in 40 U.S. areas: The national hiv surveillance system, 2016. *International Journal of Environmental Research and Public Health*, *15*(11). https://doi.org/10.3390/ijerph15112404

Derose, K. P., Bogart, L. M., Kanouse, D. E., Felton, A., Collins, D. O., Mata, M. A., Oden, C. W., Dominguez, B. X., Florez, K. R., Hawes-Dawson, J., & Williams, M. v. (2014). An intervention to reduce HIV-related stigma in partnership with African American and Latino churches. *AIDS Education and Prevention*, *26*(1), 28–42. https://doi.org/10.1521/aeap.2014.26.1.28

DHHS. (2015, December). *About the Ryan White HIV/AIDS Program*. Health Resources and Services Administration: About the Ryan White HIV/AIDS Program. https://hab.hrsa.gov/about-ryan-white-hivaids-program/about-ryan-white-hivaids-program

DiIorio, C., McCarty, F., DePadilla, L., Resnicow, K., Holstad, M. M. D., Yeager, K., Sharma, S. M., Morisky, D. E., & Lundberg, B. (2009). Adherence to antiretroviral medication regimens: A test of a psychosocial model. *AIDS and Behavior*. https://doi.org/10.1007/s10461-007-9318-4

Dombrowski, J. C., Kent, J. B., Buskin, S. E., Stekler, J. D., & Golden, M. R. (2012). Population-based metrics for the timing of HIV diagnosis, engagement in HIV care, and virologic suppression. *AIDS*, *26*(1), 77–86. https://doi.org/10.1097/QAD.0b013e32834dcee9

Dombrowski, J. C., Simoni, J. M., Katz, D. A., & Golden, M. R. (2015). Barriers to HIV Care and Treatment Among Participants in a Public Health HIV Care Relinkage Program. *AIDS Patient Care and STDs*, *29*(5), 279–287. https://doi.org/10.1089/apc.2014.0346

Dunlap, J. L., Jaramillo, J. D., Koppolu, R., Wright, R., Mendoza, F., & Bruzoni, M. (2015). The effects of language concordant care on patient satisfaction and clinical understanding for Hispanic pediatric surgery patients. *Journal of Pediatric Surgery*, *50*(9), 1586–1589. https://doi.org/10.1016/j.jpedsurg.2014.12.020

Earnshaw, V. A., Bogart, L. M., Dovidio, J. F., & Williams, D. R. (2015). Stigma and racial/ethnic HIV disparities: Moving toward resilience. *Stigma and Health*, *1*(S), 60–74. https://doi.org/10.1037/2376-6972.1.s.60

Earnshaw, V. A., Smith, L. R., Chaudoir, S. R., Amico, K. R., & Copenhaver, M. M. (2013). HIV stigma mechanisms and well-being among PLWH: A test of the HIV Stigma Framework. *AIDS and Behavior*, *17*(5), 1785–1795. https://doi.org/10.1007/s10461-013-0437-9

Eaton, L. A., Earnshaw, V. A., Maksut, J. L., Thorson, K. R., Watson, R. J., & Bauermeister, J. A. (2018). Experiences of stigma and health care engagement among Black MSM newly diagnosed with HIV/STI. *Journal of Behavioral Medicine*, *41*(4), 458–466. https://doi.org/10.1007/s10865-018-9922-y

Elflein, J. (2021). *HIV diagnoses rates leading U.S. states 2019 | Statista*. Kaiser Family Foundation. https://www.statista.com/statistics/257734/us-states-with-highest-aids-diagnosis-rates/

Escudero, D. J., Bennett, B., Suarez, S., Darrow, W. W., Mayer, K. H., & Seage, G. R. (2019). Progress and Challenges in “Getting to Zero” New HIV Infections in Miami, Florida. *Journal of the International Association of Providers of AIDS Care*, *18*. https://doi.org/10.1177/2325958219852122

Farmer, P. (2020). AIDS and Accusation. In *AIDS and Accusation* (Issue 1996). https://doi.org/10.1525/9780520933026

Fletcher, F. E., Sherwood, N. R., Rice, W. S., Yigit, I., Ross, S. N., Wilson, T. E., Weiser, S. D., Johnson, M. O., Kempf, M. C., Konkle-Parker, D., Wingood, G., Turan, J. M., & Turan, B. (2020). Resilience and HIV Treatment Outcomes among Women Living with HIV in the United States: A Mixed-Methods Analysis. *AIDS Patient Care and STDs*, *34*(8), 356–366. https://doi.org/10.1089/apc.2019.0309

Florida Department of Health. (2016). *State of Florida Integrated HIV Prevention and Care Plan 2017–2021*. https://www.in.gov/isdh/files/Final STATE OF INDIANA INTEGRATED PREVENTION AND CARE PLAN 2016(a).pdf

Florida Department of Health. (2018). *Haitian-Born Persons Living with an HIV Diagnosis in Florida, 2018*. www.211bigbend.org/flhivaidshotline

Florida Department of Health. (2019a). *Epidemiologic Profile Reports | Florida Department of Health*. Epidemiologic Profile Reports. http://www.floridahealth.gov/diseases-and-conditions/aids/surveillance/epi-profiles/index.html

Florida Department of Health. (2019b). *HIV Blacks Living with an HIV Diagnosis in Florida, 2018*. http://www.floridahealth.gov/diseases-and-conditions/aids/surveillance/_documents/fact-sheet/BlackFactsheet_2018.pdf

Florida Department of Health. (2019c). *Older Adults (Aged 50+) Living with an HIV Diagnosis in Florida, 2018*. http://www.floridahealth.gov/diseases-and-conditions/aids/surveillance/_documents/fact-sheet/OlderAdultsFactSheet.pdf

Florida Department of Health. (2019d). *White Persons Living with an HIV Diagnosis in Florida, 2018*. http://www.floridahealth.gov/diseases-and-conditions/aids/surveillance/_documents/fact-sheet/WhiteFactsheet2018.pdf

Florida Department of Health. (2020a). *Epidemiology of HIV in Florida, 2019 | Florida Department of Health*. http://www.floridahealth.gov/diseases-and-conditions/aids/surveillance/epi-slide-sets.html

Florida Department of Health. (2020b). *Persons With an HIV Diagnosis in Florida, 2019*. http://www.floridahealth.gov/diseases-and-conditions/aids/surveillance/_documents/fact-sheet/FloridaFactsheet.pdf

Florida Department of Health. (2021a). *Black Persons with an HIV Diagnosis in Florida, 2019*. http://www.floridahealth.gov/diseases-and-conditions/aids/surveillance/_documents/fact-sheet/BlackFactsheet2019.pdf

Florida Department of Health. (2021b). *Hispanic/Latinx Persons with an HIV Diagnosis in Florida, 2019*. www.floridaaids.org.

Florida Department of Health. (2021c). *HIV Data Center | Florida Department of Health*. http://www.floridahealth.gov/diseases-and-conditions/aids/surveillance/index.html

Florida Department of Health. (2021d). *Persons with an HIV Diagnosis in Broward County, Florida, 2019*. http://www.floridahealth.gov/diseases-and-conditions/aids/surveillance/_documents/fact-sheet/BrowardCountyFactsheet2019.pdf

Florida Department of Health. (2021e). *Persons with an HIV Diagnosis in Miami-Dade County, Florida, 2019*. http://www.floridahealth.gov/diseases-and-conditions/aids/surveillance/_documents/fact-sheet/Miami-DadeCountyFactsheet2019.pdf

Florida Department of Health. (2021f). *White Persons with an HIV Diagnosis in Florida, 2019*. http://www.floridahealth.gov/diseases-and-conditions/aids/surveillance/_documents/fact-sheet/WhiteFactsheet2019.pdf

Florida Department of Health. (2021g). *White Persons with an HIV Diagnosis in Florida, 2019*. http://www.floridahealth.gov/diseases-and-conditions/aids/surveillance/_documents/fact-sheet/WhiteFactsheet2019.pdf

Florida Department of Health. (2021h, March 5). *HIV Data Center | Florida Department of Health*. http://www.floridahealth.gov/diseases-and-conditions/aids/surveillance/

Fortenberry, J., Martinez, J., Rudy, B., & Monte, D. (2012). Linkage to care for HIV-positive adolescents: a multisite study of the adolescent medicine trials units of the adolescent trials network. *The Journal of Adolescent Health : Official Publication of the Society for Adolescent Medicine*, *51*(6), 551–556. https://doi.org/10.1016/J.JADOHEALTH.2012.03.012

Fouron, G. E. (2013). Race, blood, disease and citizienship: the making of the Haitian-Americans and the Haitian immigrants into “the others” during the 1980s-1990s AIDS crisis. *Identities*, *20*(6), 705–719. https://doi.org/10.1080/1070289X.2013.828624

Franzini, L., Caughy, M., Spears, W., & Fernandez Esquer, M. E. (2005). Neighborhood economic conditions, social processes, and self-rated health in low-income neighborhoods in Texas: A multilevel latent variables model. *Social Science and Medicine*, *61*(6), 1135–1150. https://doi.org/10.1016/j.socscimed.2005.02.010

Fredericksen, R. J., Edwards, T. C., Merlin, J. S., Gibbons, L. E., Rao, D., Batey, D. S., Dant, L., Páez, E., Church, A., Crane, P. K., Crane, H. M., & Patrick, D. L. (2015). Patient and provider priorities for self-reported domains of HIV clinical care. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*, *27*(10), 1255–1264. https://doi.org/10.1080/09540121.2015.1050983

Galvan, F. H., Bogart, L. M., Wagner, G. J., Klein, D. J., & Chen, Y. T. (2014). Conceptualisations of masculinity and self-reported medication adherence among HIV-positive Latino men in Los Angeles, California, USA. *Culture, Health and Sexuality*, *16*(6), 697–709. https://doi.org/10.1080/13691058.2014.902102

Gamarel, K. E., Nelson, K. M., Stephenson, R., Santiago Rivera, O. J., Chiaramonte, D., & Miller, R. L. (2018). Anticipated HIV Stigma and Delays in Regular HIV Testing Behaviors Among Sexually-Active Young Gay, Bisexual, and Other Men Who

Have Sex with Men and Transgender Women. *AIDS and Behavior*, *22*(2), 522–530. https://doi.org/10.1007/s10461-017-2005-1

Glynn, T. R., Safren, S. A., Carrico, A. W., Mendez, N. A., Duthely, L. M., Dale, S. K., Jones, D. L., Feaster, D. J., & Rodriguez, A. E. (2019). High Levels of Syndemics and Their Association with Adherence, Viral Non-suppression, and Biobehavioral Transmission Risk in Miami, a U.S. City with an HIV/AIDS Epidemic. *AIDS and Behavior*, *0123456789*. https://doi.org/10.1007/s10461-019-02619-0

Goffman, E. (1968). *Stigma; Notes on the Management of Spoiled Identity*. Englewood Cliffs, N.J. : Prentice-Hall.

Golub, S. A., & Gamarel, K. E. (2013). The impact of anticipated HIV stigma on delays in HIV testing behaviors: Findings from a community-based sample of men who have sex with men and transgender women in New York City. *AIDS Patient Care and STDs*, *27*(11), 621–627. https://doi.org/10.1089/apc.2013.0245

Goodman-Meza, D., Shoptaw, S., Weiss, R. E., Nakazono, T., Harawa, N. T., Takada, S., Garland, W. H., & Cunningham, W. E. (2019). Methamphetamine use drives decreases in viral suppression for people living with HIV released from a large municipal jail: Results of the LINK LA clinical trial. *Drug and Alcohol Dependence*, *202*, 178–184. https://doi.org/10.1016/j.drugalcdep.2019.05.007

Green, H. D., Weeks, M. R., Berman, M., Salvi, A., Gonzalez, R., Rohena, L., Ferguson, A., & Li, J. (2020). The Impact of Perceptions of Community Stigma on Utilization of HIV Care Services. *Journal of Racial and Ethnic Health Disparities*, *7*(2), 383–391. https://doi.org/10.1007/s40615-019-00667-9

Gwadz, M. V., Collins, L. M., Cleland, C. M., Leonard, N. R., Wilton, L., Gandhi, M., Scott Braithwaite, R., Perlman, D. C., Kutnick, A., & Ritchie, A. S. (2017). Using the multiphase optimization strategy (MOST) to optimize an HIV care continuum intervention for vulnerable populations: A study protocol. *BMC Public Health*, *17*(1). https://doi.org/10.1186/s12889-017-4279-7

Haderxhanaj, L. T., Dittus, P. J., Loosier, P. S., Rhodes, S. D., Bloom, F. R., & Leichliter, J. S. (2014). Acculturation, sexual behaviors, and health care access among Hispanic and non-Hispanic white adolescents and young adults in the United States, 2006-2010. *Journal of Adolescent Health*, *55*(5), 716–719. https://doi.org/10.1016/j.jadohealth.2014.06.018

Hatzenbuehler, M. L. (2009). How Does Sexual Minority Stigma “Get Under the Skin”? A Psychological Mediation Framework. *Psychological Bulletin*, *135*(5), 707–730. https://doi.org/10.1037/a0016441

Hatzenbuehler, M. L., Phelan, J. C., & Link, B. G. (2013). Stigma as a fundamental cause of population health inequalities. *American Journal of Public Health*, *103*(5), 813–821. https://doi.org/10.2105/AJPH.2012.301069

Health Resources and Services Administration. (2020). *Ryan White HIV/AIDS Program Annual Client-Level Data Report*. hab.hrsa.gov/data/data-reports

Herek, G. (1999). AIDS and Stigma. *American Behavioural Scientist*, 1106–1116. http://dx.doi.org/10.1177/00027649921954787

Hess, K., Johnson, S., Hu, X., Li, J., Wu, B., Yu, C., Zhu, H., Jin, C., Chen, M., Gerstle, J., Morgan, M., Friend, M., Johnson, A. S., Siddiqi, A., & Hernandez, A. (2017). *Diagnoses of HIV Infection in the United States and Dependent Areas, 2017*. http://www.cdc.gov/hiv/library/reports/hiv-surveillance.html.PublishedNovember2018.Accessed[date].OntheWeb:http://www.cdc.gov/hiv/library/reports/hiv-surveillance.htmlhttp://wwwn.cdc.gov/dcs/ContactUs/Form

HIV.gov. (2021, June 21). *HIV Care Continuum | HIV.gov*. https://www.hiv.gov/federal-response/policies-issues/hiv-aids-care-continuum

Horton, S. (2004). Different Subjects: The Health Care System’s Participation in the Differential Construction of the Cultural Citizenship of Cuban Refugees and Mexican Immigrants. *Medical Anthropology Quarterly*, *18*(4), 472–489. https://doi.org/10.1525/maq.2004.18.4.472

Hussen, S. A., Harper, G. W., Bauermeister, J. A., & Hightow-Weidman, L. B. (2015). Psychosocial influences on engagement in care among HIV-positive young black gay/bisexual and other men who have sex with men. *AIDS Patient Care and STDs*, *29*(2), 77–85. https://doi.org/10.1089/apc.2014.0117

Kaiser Family Foundation. (2014). *State Medicaid Coverage of Routine HIV Screening | KFF*. https://www.kff.org/hivaids/fact-sheet/state-medicaid-coverage-of-routine-hiv-screening/#footnote-medicaidexceptionnote

Kalichman, S. C., Katner, H., Banas, E., Hill, M., & Kalichman, M. O. (2020). Cumulative Effects of Stigma Experiences on Retention in HIV Care among Men and Women in the Rural Southeastern United States. *AIDS Patient Care and STDs*, *34*(11), 484–490. https://doi.org/10.1089/apc.2020.0144

Kay, E. S., Rice, W. S., Crockett, K. B., Atkins, G. C., Batey, D. S., & Turan, B. (2018). Experienced HIV-Related Stigma in Health Care and Community Settings: Mediated Associations With Psychosocial and Health Outcomes. *Journal of Acquired Immune Deficiency Syndromes (1999)*, *77*(3), 257–263. https://doi.org/10.1097/QAI.0000000000001590

Kemp, C. G., Lipira, L., Huh, D., Nevin, P. E., Turan, J. M., Simoni, J. M., Cohn, S. E., Bahk, M., Berzins, B., Andrasik, M., Mugavero, M. J., & Rao, D. (2019). HIV stigma and viral load among African-American women receiving treatment for HIV. *AIDS (London, England)*, *33*(9), 1511–1519. https://doi.org/10.1097/QAD.0000000000002212

Kim, J. H., Islam, S. J., Topel, M. L., Ko, Y. A., Mujahid, M. S., Vaccarino, V., Liu, C., Sims, M., Mubasher, M., Searles, C. D., Dunbar, S. B., Pemu, P., Taylor, H. A., Quyyumi, A. A., Baltrus, P., & Lewis, T. T. (2020). Individual psychosocial resilience, neighborhood context, and cardiovascular health in black adults: A multilevel investigation from the morehouse-emory cardiovascular center for health equity study. *Circulation: Cardiovascular Quality and Outcomes*, 733–741. https://doi.org/10.1161/CIRCOUTCOMES.120.006638

Lindau, S. T., Jerome, J., Miller, K., Monk, E., Garcia, P., & Cohen, M. (2006). Mothers on the margins: Implications for eradicating perinatal HIV. *Social Science and Medicine*, *62*(1), 59–69. https://doi.org/10.1016/j.socscimed.2005.05.012

Linley, L., Johnson, A. S., Song, R., Wu, B., Hu, S., Singh, S., Siddiqi, A., Green, T., Hall, H. I., Hernandez, A., & Morgan, M. (2018). Estimated HIV incidence and prevalence in the United States, 2010–2015. *HIV Surveillance Supplemental Report*, *23*(1), 2010–2015. http://www.cdc.gov/hiv/library/reports/hiv-surveillance.html.http://www.cdc.gov/hiv/library/reports/hiv-surveillance.htmlhttp://wwwn.cdc.gov/dcs/ContactUs/Form

Lipira, L., Williams, E. C., Huh, D., Kemp, C. G., Nevin, P. E., Greene, P., Unger, J. M., Heagerty, P., French, A. L., Cohn, S. E., Turan, J. M., Mugavero, M. J., Simoni, J. M., Andrasik, M. P., & Rao, D. (2019). HIV-Related Stigma and Viral Suppression Among African-American Women: Exploring the Mediating Roles of Depression and ART Nonadherence. *AIDS and Behavior*, *23*(8), 2025–2036. https://doi.org/10.1007/s10461-018-2301-4

Logie, C. H., Wang, Y., Lacombe-Duncan, A., Wagner, A. C., Kaida, A., Conway, T., Webster, K., de Pokomandy, A., & Loutfy, M. R. (2018). HIV-related stigma, racial discrimination, and gender discrimination: Pathways to physical and mental health-related quality of life among a national cohort of women living with HIV. *Preventive Medicine*, *107*, 36–44. https://doi.org/10.1016/j.ypmed.2017.12.018

Logie, C., James, L., Tharao, W., & Loutfy, M. (2013). Associations between HIV-Related stigma, racial discrimination, gender discrimination, and depression among hiv-positive african, caribbean, and black women in Ontario, Canada. *AIDS Patient Care and STDs*, *27*(2), 114–122. https://doi.org/10.1089/apc.2012.0296

Loutfy, M. R., Logie, C. H., Zhang, Y., Blitz, S. L., Margolese, S. L., Tharao, W. E., Rourke, S. B., Rueda, S., & Raboud, J. M. (2012). Gender and Ethnicity Differences in HIV-related Stigma Experienced by People Living with HIV in Ontario, Canada. *PLoS ONE*, *7*(12). https://doi.org/10.1371/journal.pone.0048168

Marc, L. G., Patel-Larson, A., Hall, H. I., Hughes, D., Alegría, M., Jeanty, G., Eveillard, Y. S., & Jean-Louis, E. (2010). HIV among Haitian-born persons in the United States, 1985-2007. *AIDS*, *24*(13), 2089–2097. https://doi.org/10.1097/QAD.0b013e32833bedff

Matson, T. E., McGinnis, K. A., Rubinsky, A. D., Frost, M. C., Czarnogorski, M., Bryant, K. J., Jennifer Edelman, E., Satre, D. D., Catz, S. L., Bensley, K. M., Fiellin, D. A., Justice, A. C., & Williams, E. C. (2018). Gender and alcohol use: Influences on HIV care continuum in a national cohort of patients with HIV. *AIDS*, *32*(15), 2247–2253. https://doi.org/10.1097/QAD.0000000000001946

Maughan-Brown, B., Harrison, A., Galárraga, O., Kuo, C., Smith, P., Bekker, L. G., & Lurie, M. N. (2019). Factors affecting linkage to HIV care and ART initiation following referral for ART by a mobile health clinic in South Africa: evidence from a multimethod study. *Journal of Behavioral Medicine*, *42*(5), 883–897. https://doi.org/10.1007/s10865-018-0005-x

Menon, A. A., Nganga-Good, C., Martis, M., Wicken, C., Lobner, K., Rothman, R. E., & Hsieh, Y. H. (2016). Linkage-to-care Methods and Rates in U.S. Emergency Department–based HIV Testing Programs: A Systematic Literature Review Brief Report. *Academic Emergency Medicine*, *23*(7), 835–842. https://doi.org/10.1111/acem.12987

Meyer, I. H. (1995). Minority stress and mental health in gay men. *Journal of Health and Social Behavior*, *36*(1), 38–56. https://doi.org/10.2307/2137286

Migration Policy Institute. (2020). *Haitian Immigrants in the United States | migrationpolicy.org*. https://www.migrationpolicy.org/article/haitian-immigrants-united-states-2018

Morales-Aleman, M. M., & Sutton, M. Y. (2014). Hispanics/Latinos and the HIV continuum of care in the Southern USA: A qualitative review of the literature, 2002-2013. In *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV* (Vol. 26, Issue 12, pp. 1592–1604). Routledge. https://doi.org/10.1080/09540121.2014.936817

Mugavero, M. J., Rivet Amico, K., Horn, T., & Thompson, M. A. (2013). The State of Engagement in HIV Care in the United States: From Cascade to Continuum to Control. *Clinical Infectious Diseases*, *35294*(8), 1164–1171. https://doi.org/10.1093/cid/cit420

Nance, R. M., Chris Delaney, J. A., Simoni, J. M., Wilson, I. B., Mayer, K. H., Whitney, B. M., Aunon, F. M., Safren, S. A., Mugavero, M. J., Christopher Mathews, W., Christopoulos, K. A., Eron, J. J., Napravnik, S., Moore, R. D., Rodriguez, B., Lau, B., Fredericksen, R. J., Saag, M. S., Kitahata, M. M., & Crane, H. M. (2018). HIV viral suppression trends over time among HIV-infected patients receiving care in the United States, 1997 to 2015 a cohort study. In *Annals of Internal Medicine* (Vol. 169, Issue 6, pp. 376–384). American College of Physicians. https://doi.org/10.7326/M17-2242

National Center for HIV/AIDS, V. H. (2021, May 27). *2019 National HIV Surveillance System Reports | NCHHSTP | CDC*. https://www.cdc.gov/nchhstp/newsroom/2021/2019-national-hiv-surveillance-system-reports.html

NCSS. (2021). *ROC Curves*. https://www.ncss.com/software/ncss/roc-curves-ncss/

Pasipanodya, E. C., Li, M. J., Jain, S., Sun, X., Tobin, J., Ellorin, E., Dube, M., Daar, E. S., Corado, K., Milam, J., Blumenthal, J., Sheldon, ·, Morris, H., David, ·, & Moore, J. (2020). Greater Levels of Self-Reported Adherence to Pre-Exposure Prophylaxis (PrEP) are Associated with Increased Condomless Sex Among Men Who Have Sex with Men. *AIDS and Behavior*, *24*, 3192–3204. https://doi.org/10.1007/s10461-020-02881-7

Payne-Foster, P., Bradley, E. L. P., Aduloju-Ajijola, N., Yang, X., Gaul, Z., Parton, J., Sutton, M. Y., & Gaskins, S. (2018). Testing our FAITHH: HIV stigma and knowledge after a faith-based HIV stigma reduction intervention in the Rural South. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*, *30*(2), 232–239. https://doi.org/10.1080/09540121.2017.1371664

Pearson, C. A., Johnson, M. O., Neilands, T. B., Dilworth, S. E., Sauceda, J. A., Mugavero, M. J., Crane, H. M., Fredericksen, R. J., Mathews, W. C., Moore, R. D., Napravnik, S., Mayer, K. H., & Christopoulos, K. A. (2021). Internalized HIV Stigma Predicts Suboptimal Retention in Care among People Living with HIV in the United States. *AIDS Patient Care and STDs*, *35*(5), 188–193. https://doi.org/10.1089/apc.2020.0244

Pellowski, J. A., Kalichman, S. C., Matthews, K. A., & Adler, N. (2013). A pandemic of the poor: social disadvantage and the U.S. HIV epidemic. *Am Psychol.*, *68*(4), 197–209. https://doi.org/10.1037/a0032694

Pérez-Escamilla, R., Garcia, J., & Song, D. (2010). HEALTH CARE ACCESS AMONG HISPANIC IMMIGRANTS: ¿ALGUIEN ESTÁ ESCUCHANDO?[IS ANYBODY LISTENING?]. *NAPA Bulletin*, *34*(1), 47–67. https://doi.org/10.1111/j.1556-4797.2010.01051.x

Pew Research Center. (2014). *The Shifting Religious Identity of Latinos in the United States | Pew Research Center's Religion & Public Life Project*. Pew Research

Center. https://www.pewforum.org/2014/05/07/major-new-survey-explores-the-shifting-religious-identity-of-latinos-in-the-united-states/

Purcell, D., Harris, N., Mccray, E., Dean, H. D., Mermin, J., Maciak, B., Dietz, P. M., Krueger, A. L., Wolitski, R. J., Hall, H. I., Prejean, J., Heitgerd, J., Mccree, D. H., Lyles, C., Johnson, A. S., Bradley, H., Wejnert, C., Johnson, C., Handel, M. van, … Dooley, S. (2015). *National HIV Prevention Progress Report, 2015 (Includes data for 2006 through 2014 where available)*. www.cdc.gov/hiv/pdf/policies/progressreports/cdc-hiv-nationalprogressreport.pdf

Radcliffe, J., Doty, N., Hawkins, L. A., Gaskins, C. S., Beidas, R., & Rudy, B. J. (2010). Stigma and sexual health risk in HIV-positive african american young men who have sex with men. *AIDS Patient Care and STDs*, *24*(8), 493–499. https://doi.org/10.1089/apc.2010.0020

Raj, A., Silverman, J. G., & Amaro, H. (2004). Abused women report greater male partner risk and gender-based risk for HIV: Findings from a community-based study with Hispanic women. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*, *16*(4), 519–529. https://doi.org/10.1080/09540120410001683448

Rao, D., Feldman, B. J., Fredericksen, R. J., Crane, P. K., Simoni, J. M., Kitahata, M. M., & Crane, H. M. (2012). A Structural Equation Model of HIV-Related Stigma, Depressive Symptoms, and Medication Adherence. *AIDS and Behavior*, *16*(3), 711–716. https://doi.org/10.1007/s10461-011-9915-0

Rice, W. S., Crockett, K. B., Mugavero, M. J., Raper, J. L., Atkins, G. C., & Turan, B. (2017). Association between internalized HIV-related stigma and HIV care visit adherence. *Journal of Acquired Immune Deficiency Syndromes*, *76*(5). https://doi.org/10.1097/QAI.0000000000001543

Rintamaki, L. S., Davis, T. C., Skripkauskas, S., Bennett, C. L., & Wolf, M. S. (2006). Social stigma concerns and HIV medication adherence. *AIDS Patient Care and STDs*, *20*(5), 359–368. https://doi.org/10.1089/apc.2006.20.359

Rios-Ellis, B., Becker, D., Espinoza, L., Nguyen-Rodriguez, S., Diaz, G., Carricchi, A., Galvez, G., & Garcia, M. (2015). Evaluation of a community health worker intervention to reduce HIV/AIDS stigma and increase HIV testing among underserved latinos in the southwestern U.S. *Public Health Reports*, *130*(5), 458–467. https://doi.org/10.1177/003335491513000509

Rivera, D. B., Brady, J. P., & Blashill, A. J. (2021). Traditional Machismo, Caballerismo, and the Pre-Exposure Prophylaxis (PrEP) Cascade Among a Sample of Latino Sexual Minority Men. *Journal of Sex Research*, *58*(1), 21–28. https://doi.org/10.1080/00224499.2020.1743961

Rivera Mindt, M., Arentoft, A., Tureson, K., Summers, A. C., Morris, E. P., Guzman, V., Aghvinian, M. N., Alvarez, K., Robbins, R. N., Savin, M. J., & Byrd, D. (2020). Disparities in Electronically Monitored Antiretroviral Adherence and Differential Adherence Predictors in Latinx and Non-Latinx White Persons Living with HIV. *AIDS Patient Care and STDs*, *34*(8), 344–355. https://doi.org/10.1089/apc.2019.0256

Robertson, M., Laraque, F., Mavronicolas, H., Braunstein, S., & Torian, L. (2015). Linkage and retention in care and the time to HIV viral suppression and viral rebound - New York City. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*, *27*(2), 260–267. https://doi.org/10.1080/09540121.2014.959463

Rodriguez, A. E., Wawrzyniak, A. J., Tookes, H. E., Vidal, M. G., Soni, M., Nwanyanwu, R., Goldberg, D., Freeman, R., Villamizar, K., Alcaide, M. L., & Kolber, M. A. (2019). Implementation of an Immediate HIV Treatment Initiation Program in a Public/Academic Medical Center in the U.S. South: The Miami Test and Treat Rapid Response Program. *AIDS and Behavior*, *23*, 287–295. https://doi.org/10.1007/s10461-019-02655-w

Rojas, P., Huang, H., Li, T., Ravelo, G. J., Sanchez, M., Dawson, C., Brook, J., Kanamori, M., & de La Rosa, M. (2016). Sociocultural determinants of risky sexual behaviors among adult latinas: A longitudinal study of a community-based sample. *International Journal of Environmental Research and Public Health*, *13*(11). https://doi.org/10.3390/ijerph13111164

Rooks-Peck, C. R., Adegbite, A. H., Wichser, M. E., Ramshaw, R., Mullins, M. M., Higa, D., & Sipe, T. A. (2018). Mental health and retention in HIV care: A systematic review and meta-analysis. *Health Psychology*, *37*(6), 574–585. https://doi.org/10.1037/hea0000606

Rueda, S., Mitra, S., Chen, S., Gogolishvili, D., Globerman, J., Chambers, L., Wilson, M., Logie, C. H., Shi, Q., Morassaei, S., & Rourke, S. B. (2016). Examining the associations between HIV-related stigma and health outcomes in people living with HIV/AIDS: a series of meta-analyses. *BMJ Open*. https://doi.org/10.1136/bmjopen-2016-011453

Ruiz, J. M., Hamann, H. A., Mehl, M. R., & O’Connor, M. F. (2016). The Hispanic health paradox: From epidemiological phenomenon to contribution opportunities for psychological science. *Group Processes and Intergroup Relations*, *19*(4), 462–476. https://doi.org/10.1177/1368430216638540

SAMSHA. (2019). Key substance use and mental health indicators in the United States: Results from the 2019 National Survey on Drug Use and Health. In *HHS Publication No. PEP19-5068, NSDUH Series H-54* (Vol. 170). https://www.samhsa.gov/data/

Sanchez, A. A. (2018). An Examination of the Folk Healing Practice of Curanderismo in the Hispanic Community. *Journal of Community Health Nursing*, *35*(3), 148–161. https://doi.org/10.1080/07370016.2018.1475801

Sanchez, M., Diez, S., Fava, N. M., Cyrus, E., Ravelo, G., Rojas, P., Li, T., Cano, M. A., & de La Rosa, M. (2019). Immigration Stress among Recent Latino Immigrants: The Protective Role of Social Support and Religious Social Capital. *Social Work in Public Health*, *34*(4), 279–292. https://doi.org/10.1080/19371918.2019.1606749

Sanchez, M., Sheehan, D. M., & Forney, D. (2019). HIV AMONG LATINO IMMIGRANTS IN THE UNITED STATES: THE IMPACT OF SOCIO-CULTURAL DETERMINANTS AND MIGRATION. In *VIH , Migraciones Y Derechos Humanos Perspectivas Internacionales* (pp. 105–136).

Sayles, J. N., Wong, M. D., Kinsler, J. J., Martins, D., & Cunningham, W. E. (2009). The association of stigma with self-reported access to medical care and antiretroviral therapy adherence in persons living with HIV/AIDS. *Journal of General Internal Medicine*, *24*(10), 1101–1108. https://doi.org/10.1007/s11606-009-1068-8

Scharf, D. P., Mathews, K. J., Jackson, P., Hofsuemmer, J., Martin, E., & Edwards, D. (2010). More than Tuskegee: Understanding mistrust about research participation. *Journal of Health Care for the Poor and Underserved*, *21*(3), 879–897. https://doi.org/10.1353/hpu.0.0323

Schumann, C. L., Westergaard, R. P., Meier, A. E., Ruetten, M. L., & Vergeront, J. M. (2019). Developing a Patient Navigation Program to Improve Engagement in HIV Medical Care and Viral Suppression: A Demonstration Project Protocol. *AIDS and Behavior*, *23*(Suppl 1), 5–13. https://doi.org/10.1007/s10461-017-1727-4

Schuster, M. A., Collins, R., Cunningham, W. E., Morton, S. C., Zierler, S., Wong, M., Tu, W., & Kanouse, D. E. (2005). Perceived discrimination in clinical care in a nationally representative sample of HIV-infected adults receiving health care. *Journal of General Internal Medicine*, *20*(9), 807–813. https://doi.org/10.1111/j.1525-1497.2005.05049.x

Senaviratna, N. A. M. R., & A. Cooray, T. M. J. (2019). Diagnosing Multicollinearity of Logistic Regression Model. *Asian Journal of Probability and Statistics*, *5*(2), 1–9. https://doi.org/10.9734/ajpas/2019/v5i230132

Shacham, E., López, J. D., Brown, T. M., Tippit, K., & Ritz, A. (2018). Enhancing Adherence to Care in the HIV Care Continuum: The Barrier Elimination and Care Navigation (BEACON) Project Evaluation. *AIDS and Behavior*, *22*(1), 258–264. https://doi.org/10.1007/s10461-017-1819-1

Sheehan, D. M., Fennie, K. P., Mauck, D. E., Maddox, L. M., Lieb, S., & Trepka, M. J. (2017). Retention in HIV Care and Viral Suppression: Individual- and

Neighborhood-Level Predictors of Racial/Ethnic Differences, Florida, 2015. *AIDS Patient Care and STDs*, *31*(4), 167–175. https://doi.org/10.1089/apc.2016.0197

Sheehan, D. M., Trepka, M. J., Fennie, K. P., & Maddox, L. M. (2015). Rate of new HIV diagnoses among Latinos living in Florida: Disparities by country/region of birth. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*, *27*(4), 507–511. https://doi.org/10.1080/09540121.2014.978731

Sheehan, D. M., Trepka, M. J., Fennie, K. P., Prado, G., Madhivanan, P., Dillon, F. R., & Maddox, L. M. (2017). Individual and Neighborhood Determinants of Late HIV Diagnosis Among Latinos, Florida, 2007–2011. *Journal of Immigrant and Minority Health*, *19*(4), 825–834. https://doi.org/10.1007/s10903-016-0422-2

Siegler, E. L., Burchett, C. O., & Glesby, M. J. (2018). Older people with HIV are an essential part of the continuum of HIV care. In *Journal of the International AIDS Society* (Vol. 21, Issue 10, p. 25188). https://doi.org/10.1002/jia2.25188

Simoni, J. M., Huh, D., Wilson, I. B., Shen, J., Goggin, K., Reynolds, N. R., Remien, R. H., Rosen, M. I., Bangsberg, D. R., & Liu, H. (2012). *Racial/Ethnic Disparities in ART Adherence in the United States: Findings From the MACH14 Study*. http://www.aardex.ch

Smit, P. J., Brady, M., Carter, M., Fernandes, R., Lamore, L., Meulbroek, M., Ohayon, M., Platteau, T., Rehberg, P., Rockstroh, J. K., & Thompson, M. (2012). HIV-related stigma within communities of gay men: A literature review. In *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV* (Vol. 24, Issue 4, pp. 405–412). https://doi.org/10.1080/09540121.2011.613910

Ssebutinde, P., Kyamwanga, I. T., Turyakira, E., Asiimwe, S., & Bajunirwe, F. (2018). Effect of age at initiation of antiretroviral therapy on treatment outcomes; A retrospective cohort study at a large HIV clinic in southwestern Uganda. *PLoS ONE*, *13*(8). https://doi.org/10.1371/journal.pone.0201898

Stirratt, M. J., Remien, R. H., Smith, A., Copeland, O. Q., Dolezal, C., Krieger, D., Remien, R. H., Smith, · A, Copeland, · O Q, Dolezal, · C, Krieger, · D, & Stirratt, M. J. (2006). The Role of HIV Serostatus Disclosure in Antiretroviral Medication Adherence. *AIDS Behav*, *10*, 483–493. https://doi.org/10.1007/s10461-006-9106-6

Stringer, K. L., Turan, B., McCormick, L., Durojaiye, M., Nyblade, L., Kempf, M. C., Lichtenstein, B., & Turan, J. M. (2016). HIV-Related Stigma Among Healthcare Providers in the Deep South. *AIDS and Behavior*, *20*(1), 115–125. https://doi.org/10.1007/s10461-015-1256-y

Suarez, M., Raffaelli, M., & O'Leary, A. (1996). Use of folk healing practices by HIV-infected Hispanics living in the United States. *AIDS Care - Psychological and*

Socio-Medical Aspects of AIDS/HIV, *8*(6), 683–690. https://doi.org/10.1080/09540129650125399

Sullivan PS, Woodyatt C, Koski C, Pembleton E, McGuinness P, Taussig J, Ricca A, Luisi N, Mokotoff E, Benbow N, & Castel AD. (2020). A data visualization and dissemination resource to support HIV prevention and care at the local level: analysis and uses of the AIDSVu Public Data Resource. *Journal of Medical Internet Research*, *20*(10). https://aidsvu.org/local-data/united-states/south/florida/miami/

Swendeman, D., Rotheram-Borus, M. J., Comulada, S., Weiss, R., & Ramos, M. E. (2006). Predictors of HIV-related stigma among young people living with HIV. *Health Psychology*, *25*(4), 501–509. https://doi.org/10.1037/0278-6133.25.4.501

The White House. (2015). *National HIV/AIDS Strategy for the United States: Updated to 2020*.

Torian, L. v, Wiewel, E. W., Liu, K. L., Sackoff, J. E., & Frieden, T. R. (2008). Risk factors for delayed initiation of medical care after diagnosis of human immunodeficiency virus. *Archives of Internal Medicine*, *168*(11), 1181–1187. https://doi.org/10.1001/archinte.168.11.1181

Trepka, M. J., Sheehan, D. M., Fennie, K. P., Mauck, D. E., Lieb, S., Maddox, L. M., & Niyonsenga, T. (2018). Racial/Ethnic Disparities in Failure to Initiate HIV Care: Role of HIV Testing Site, Individual Factors, and Neighborhood Factors, Florida, 2014-2015. *Journal of Health Care for the Poor and Underserved*, *29*(3), 1153–1175. https://doi.org/10.1353/hpu.2018.0085

Tripathi, A., Gardner, L. I., Ogbuanu, I., Youmans, E., Stephens, T., Gibson, J. J., & Duffus, W. A. (2011). Predictors of time to enter medical care after a new HIV diagnosis: A statewide population-based study. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*, *23*(11), 1366–1373. https://doi.org/10.1080/09540121.2011.565032

Tucker, J. D., Tso, L. S., Hall, B., Ma, Q., Beanland, R., Best, J., Li, H., Lackey, M., Marley, G., Rich, Z. C., Sou, K. lon, & Doherty, M. (2017). Enhancing Public Health HIV Interventions: A Qualitative Meta-Synthesis and Systematic Review of Studies to Improve Linkage to Care, Adherence, and Retention. *EBioMedicine*, *17*, 163–171. https://doi.org/10.1016/j.ebiom.2017.01.036

Turan, B., Budhwani, H., Fazeli, P. L., Browning, W. R., Raper, J. L., Mugavero, M. J., & Turan, J. M. (2017). How Does Stigma Affect People Living with HIV? The Mediating Roles of Internalized and Anticipated HIV Stigma in the Effects of Perceived Community Stigma on Health and Psychosocial Outcomes. *AIDS and Behavior*, *21*(1), 283–291. https://doi.org/10.1007/s10461-016-1451-5

Turan, B., Crockett, K. B., Buyukcan-Tetik, A., Kempf, M. C., Konkle-Parker, D., Wilson, T. E., Tien, P. C., Wingood, G., Neilands, T. B., Johnson, M. O., Weiser, S. D., & Turan, J. M. (2019). Buffering Internalization of HIV Stigma: Implications for Treatment Adherence and Depression. *Journal of Acquired Immune Deficiency Syndromes*, *80*(3), 284–291. https://doi.org/10.1097/QAI.0000000000001915

Turan, B., Hatcher, A. M., Weiser, S. D., Johnson, M. O., Rice, W. S., & Turan, J. M. (2017). Framing mechanisms linking HIV-related stigma, adherence to treatment, and health outcomes. In *American Journal of Public Health* (Vol. 107, Issue 6, pp. 863–869). American Public Health Association Inc. https://doi.org/10.2105/AJPH.2017.303744

Ulett, K. B., Willig, J. H., Lin, H. Y., Routman, J. S., Abroms, S., Allison, J., Chatham, A., Raper, J. L., Saag, M. S., & Mugavero, M. J. (2009). The therapeutic implications of timely linkage and early retention in HIV care. *AIDS Patient Care and STDs*, *23*(1), 41–49. https://doi.org/10.1089/apc.2008.0132

UNAIDS. (2014). UNAIDS Goal 90-90-90: An ambitious treatment target to help end the AIDS epidemic. *Http://Www.Unaids.Org/Sites/Default/Files/Media_Asset/90-90-90_En_0.Pdf*, 40.

United States Census Bureau. (2021). *U.S. Census Bureau QuickFacts: United States*. https://www.census.gov/quickfacts/fact/dashboard/US/RHI725219

U.S. Department of Health and Human Services. (2021a). *HIV National Strategic Plan for the United States: A Roadmap to End the HIV Epidemic (2021-2025)*. https://www.hiv.gov/

U.S. Department of Health and Human Services. (2021b). *Prior HHS Poverty Guidelines and Federal Register References | ASPE*. PRIOR HHS POVERTY GUIDELINES AND FEDERAL REGISTER REFERENCES. https://aspe.hhs.gov/prior-hhs-poverty-guidelines-and-federal-register-references

Valenzuela, C., Ugarte-Gil, C., Paz, J., Echevarria, J., Gotuzzo, E., Vermund, S. H., & Kipp, A. M. (2015). HIV Stigma as a Barrier to Retention in HIV Care at a General Hospital in Lima, Peru: A Case–Control Study. *AIDS and Behavior*, *19*(2), 235–245. https://doi.org/10.1007/s10461-014-0908-7

Valverde, E., Rodriguez, A., White, B., Guo, Y., & Waldrop-Valverde, D. (2018). Understanding the Association of Internalized HIV Stigma with Retention in HIV Care. *Journal of HIV and AIDS*, *4*(3). https://doi.org/10.16966/2380-5536.159

Vanable, P. A., Carey, M. P., Blair, D. C., & Littlewood, R. A. (2006). Impact of HIV-related stigma on health behaviors and psychological adjustment among HIV-positive men and women. *AIDS and Behavior*. https://doi.org/10.1007/s10461-006-9099-1

Varni, S. E., Miller, C. T., McCuin, T., & Solomon, S. (2012). Disengagement and engagement coping with HIV/AIDS stigma and psychological well-being of people with HIV/AIDS. *Journal of Social and Clinical Psychology, 31*(2), 123–150. https://doi.org/10.1521/jscp.2012.31.2.123

White House Office of National AIDS Policy. (2013). *National HIV/AIDS Strategy, Improving outcomes: accelerating progress along the HIV care continuum*. https://www.hivlawandpolicy.org/sites/default/files/National HIV AIDS Strategy%2C Improving Outcomes Accelerating Progress Along the HIV Care Continuum %28The White House Office of National AIDS Policy%29.pdf

Williams, D. R., & Williams-Morris, R. (2000). Racism and mental health: The African American experience. *Ethnicity and Health*. https://doi.org/10.1080/713667453

Williams, R., Cook, R., Brumback, B., Cook, C., Ezenwa, M., Spencer, E., & Lucero, R. (2020). The relationship between individual characteristics and HIV-related stigma in adults living with HIV: Medical monitoring project, Florida, 2015-2016. *BMC Public Health, 20*(1), 1–10. https://doi.org/10.1186/s12889-020-08891-3

Wingood, G. M., DiClemente, R. J., Mikhail, I., McCree, D. H., Davies, S. L., Hardin, J. W., Harris Peterson, S., Hook, E. W., & Saag, M. (2007). HIV discrimination and the health of women living with HIV. *Women and Health, 46*(2–3), 99–112. https://doi.org/10.1300/J013v46n02_07

Wu, K., Tie, Y., Dasgupta, S., Beer, L., & Marcus, R. (2021). Injection and Non-Injection Drug Use Among Adults with Diagnosed HIV in the United States, 2015-2018. *AIDS and Behavior*. https://doi.org/10.1007/s10461-021-03457-9

Xia, Q., Zhong, Y., Wiewel, E. W., Braunstein, S. L., & Torian, L. v. (2017). Linkage to care after HIV diagnosis in New York City: Better than we thought. In *Journal of Acquired Immune Deficiency Syndromes* (Vol. 76, Issue 1, pp. e18–e21). Lippincott Williams and Wilkins. https://doi.org/10.1097/QAI.0000000000001419

Yehia, B. R., Stewart, L., Momplaisir, F., Mody, A., Holtzman, C. W., Jacobs, L. M., Hines, J., Mounzer, K., Glanz, K., Metlay, J. P., & Shea, J. A. (2015). Barriers and facilitators to patient retention in HIV care. *BMC Infectious Diseases, 15*(1), 1–10. https://doi.org/10.1186/s12879-015-0990-0

Yigit, I., Modi, R. A., Weiser, S. D., Johnson, M. O., Mugavero, M. J., Turan, J. M., & Turan, B. (2020). Effects of an intervention on internalized HIV-related stigma for individuals newly entering HIV care. *AIDS (London, England), 34*(Suppl 1), S73–S82. https://doi.org/10.1097/QAD.0000000000002566

Yu, W., Xu, W., & Zhu, L. (2017). A modified Hosmer–Lemeshow test for large data sets. *Communications in Statistics - Theory and Methods, 46*(23), 11813–11825. https://doi.org/10.1080/03610926.2017.1285922

Zanoni, B. C., & Mayer, K. H. (2014). The adolescent and young adult HIV cascade of care in the United States: Exaggerated health disparities. *AIDS Patient Care and STDs*, *28*(3), 128–135. https://doi.org/10.1089/apc.2013.0345

Table 1.

Descriptive statistics PLWH in Florida stratified by HIV continuum of care outcomes based on 2015-2017 samples of the Medical Monitoring Project

Variable	Overall	Linkage to care (30 days)		Retention in care		Viral Suppression	
		Yes (34.08%)	No (65.92%)	Yes (83.46%)	No (16.54%)	Yes (73.05%)	No (26.95%)
Gender							
Male	503 (70.3%)	184 (36.27%)	319 (63.73%)	459 (83.15%)	44 (16.85%)	422 (75.33%)	81 (24.67%)
Female	268 (29.7%)	83 (28.91%)	185 (71.09%)	247 (84.18%)	21(15.82%)	205 (67.67%)	63 (32.33%)
Age							
18-34	97 (14.9%)	38 (37.28%)	59 (62.72%)	85 (77.40%)	12 (22.60%)	66 (59.94%)	31 (40.06%)
35-49	221 (26.0%)	80 (36.86%)	141 (63.14%)	205 (89.26%)	16 (10.74%)	177 (77.74%)	44 (22.26%)
50+	453 (59.2%)	149 (32.06%)	304 (67.94%)	416 (82.44%)	37 (17.56%)	384 (74.28%)	69 (25.72%)
Education							
High School/GED or Less	364 (46.9%)	112 (31.91%)	252 (68.09%)	331 (77.76%)	33 (22.24%)	295 (71.19%)	69 (28.81%)
Some College or more	407 (53.1%)	155 (36.01%)	252 (63.99%)	375 (88.50%)	32 (11.50%)	332 (67.67%)	75 (25.31%)
Race/Ethnicity							
White	220 (29.2%)	82 (34.44%)	138 (65.56%)	205 (86.79%)	15 (13.21%)	193 (80.15%)	27 (19.85%)
Black	338 (50.0%)	121 (31.34%)	267 (68.66%)	347 (77.31%)	41 (22.69%)	288 (62.41%)	100 (37.59%)
Hispanic	163 (20.8%)	64 (40.18%)	99 (59.82%)	154 (93.58%)	9 (6.42%)	146 (88.65%)	17 (11.35%)
Sexual Orientation							
Heterosexual	482 (60.8%)	148 (30.30%)	334 (69.70%)	438 (82.00%)	44 (18.00%)	380 (69.47%)	102 (30.53%)
Not Heterosexual	289 (39.2%)	119 (39.96%)	170 (60.04%)	268 (85.73%)	21 (14.27%)	247 (78.60%)	42 (21.40%)
Non-Injected Drug Use?							
No	573 (73.0%)	204 (34.59%)	369 (65.41%)	533 (84.95%)	40 (15.05%)	482 (75.17%)	91 (24.83%)
Yes	198 (27.0%)	63 (32.72%)	135 (67.28 %)	173 (79.42%)	25 (20.58%)	145 (67.32%)	53 (32.68%)
Binge Drinking?							
No	686 (87.4%)	231 (32.78%)	455 (67.22%)	632 (84.32%)	54 (15.68%)	564 (73.95%)	122 (26.05%)
Yes	85 (12.6%)	36 (43.16%)	49 (56.84%)	74 (77.44%)	11 (22.56%)	63 (66.79%)	22 (33.21%)
Insurance							
Private	274 (37.5%)	102 (35.29%)	172 (64.71%)	234 (74.98%)	40 (25.02%)	228 (70.70%)	46 (29.30%)
Public	487 (62.5%)	165 (33.36%)	332 (66.64%)	472 (88.54%)	25 (11.46%)	399 (74.45%)	98 (25.55%)
Household Income							
At/below Poverty level	511 (64.2%)	169 (32.97%)	342 (67.03%)	477 (84.95%)	34 (15.05%)	410 (73.14%)	101 (26.86%)
Above poverty level	260 (35.8%)	98 (36.09%)	162 (63.91%)	229 (80.79%)	31 (19.21%)	217 (72.89%)	43 (27.11%)
HIV-Related Stigma							
High Negative Self-image	263 (34.0%)	98 (36.62%)	165 (63.38%)	240 (82.21%)	23 (17.79%)	199 (68.12%)	64 (31.88%)
Low Negative self-image	508 (66.0%)	169 (32.78%)	339 (67.22%)	466 (84.10%)	42 (15.90%)	428 (75.58%)	80 (24.42%)
High Personalized Stigma	223 (25.9%)	86 (35.45%)	170 (64.55%)	211 (89.04%)	12 (10.96%)	175 (73.45%)	48 (26.55%)
Med Personalized Stigma	255 (34.1%)	81 (31.49%)	143 (68.51%)	231 (82.52%)	24 (17.48%)	209 (74.25%)	46 (25.75%)
Low Personalized Stigma	293 (39.9%)	100 (35.41%)	191 (64.59%)	264 (80.63%)	29 (19.37%)	243 (71.76%)	50 (28.24%)
High Anticipated Stigma	256 (32.1%)	102 (33.52%)	191 (66.48%)	232 (80.06%)	24 (19.94%)	202 (68.16%)	54 (31.84%)
Med Anticipated Stigma	224 (30.0%)	83 (35.71%)	172 (64.29%)	202 (79.78%)	22 (20.22%)	184 (73.56%)	40 (26.44%)
Low Anticipated Stigma	291 (38.0%)	82 (33.28%)	141 (66.72%)	272 (89.23%)	19 (10.77%)	241 (76.77%)	50 (23.23%)

Table 2.

Crude and adjusted odds ratios and 95% confidence intervals of HIV-related stigma subtypes on linkage to care within 30 days of diagnosis

Variable	Model 1 (Crude)			Model 2 (adjusted)		
	AOR	95% CI	P	AOR	95% CI	P
Gender						
Male	REF			REF		
Female	0.715	0.693, 0.737	<0.001**	0.870	0.838, 0.903	<0.001**
Age						
35-49	REF			REF		
18-34	1.018	0.975, 1.064	0.416	1.011	0.965, 1.058	<0.001**
50+	0.809	0.783, 0.835	<0.001**	0.872	0.843, 0.902	0.654
Education						
High School/Ged or Less	1.201	1.168, 1.234	<0.001**	0.927	0.898, 0.956	<0.001**
Some College or More	REF			REF		
Race/Ethnicity						
White	REF			REF		
Black	0.869	0.842, 0.898	<0.001**	1.083	1.043, 1.125	<0.001**
Hispanic	1.279	1.230, 1.329	<0.001**	1.297	1.245, 1.351	<0.001**
Sexual Orientation						
Heterosexual	REF			REF		
Not Heterosexual	1.531	1.489, 1.575	<0.001**	1.441	1.391, 1.493	<0.001**
Non-Injected Drug Use?						
No	REF			REF		
Yes	0.920	0.891, 0.949	<0.001**	0.784	0.758, 0.810	<0.001**
Binge Drinking?						
No	REF			REF		
Yes	1.557	1.496, 1.621	<0.001**	1.442	1.379, 1.508	<0.001**
Insurance						
Private	REF			REF		
Public	0.918	0.892, 0.944	<0.001**	1.029	0.962, 1.034	0.106
Household Income						
At/Below Poverty Level	REF			REF		
Above Poverty Level	1.148	1.116, 1.182	<0.001**	0.997	0.888, 0.957	0.872
HIV-Related Stigma						
High Negative Self-Image	1.185	1.151, 1.220	<0.001**	1.242	1.206, 1.286	<0.001**
Low Negative Self-Image	REF			REF		
High Personalized Stigma	1.002	0.968, 1.037	0.921	1.007	0.969, 1.046	0.583
Mod Personalized Stigma	0.838	0.812, 0.866	<0.001**	0.795	0.768, 0.822	<0.001**
Low Personalized Stigma	REF			REF		
High Anticipated Stigma	1.011	0.978, 1.045	0.528	1.061	1.021, 1.102	0.003**
Mod Anticipated Stigma	1.113	1.077, 1.151	<0.001**	1.197	1.156, 1.239	<0.001**
Low Anticipated Stigma	REF			REF		
Type 3 Analysis of Effects HIV-Related X Race Stigma Interactions						P
Personalized Stigma X Race/Ethnicity						<0.001
Negative Self-image X Race/Ethnicity						<0.001
Anticipated Stigma X Race/Ethnicity						<0.001

Note. REF = Reference group; [a]n = 771; weighted n = 89,889; *p < .05 **p <.01

Table 3.

Crude and adjusted odds ratios and 95% confidence intervals of HIV-related stigma subtypes on retention in HIV care

Variable	Model 1 (Crude)			Model 2 (adjusted)		
	OR	95% CI	P	AOR	95% CI	P
Gender						
Male	REF			REF		
Female	1.078	1.037, 1.121	<0.001**	1.226	1.167, 1.288	<0.001**
Age						
35-49	REF			REF		
18-34	0.412	0.389, 0.437	<0.001**	0.531	0.498, 0.567	<0.001**
50+	0.565	0.539, 0.592	<0.001**	0.493	0.468, 0.519	<0.001**
Education						
High School/Ged or Less	2.201	2.122, 2.282	<0.001**	0.399	0.382, 0.417	<0.001**
Some College or More	REF			REF		
Race/Ethnicity						
White	REF			REF		
Black	0.518	0.497, 0.541	<0.001**	0.499	0.473, 0.526	<0.001**
Hispanic	2.217	2.071, 2.375	<0.001**	1.727	1.607, 1.858	<0.001**
Sexual Orientation						
Heterosexual	REF			REF		
Not Heterosexual	1.319	1.271, 1.369	<0.001**	1.199	1.140, 1.260	<0.001**
Non-Injected Drug Use?						
No	REF			REF		
Yes	0.684	0.658, 0.710	<0.001**	0.573	0.549, 0.599	<0.001**
Binge Drinking?						
No	REF			REF		
Yes	0.638	0.608, 0.670	<0.001**	0.644	0.606, 0.683	<0.001**
Insurance						
Private	REF			REF		
Public	2.578	2.487, 2.672	<0.001**	3.799	3.628, 3.980	<0.001**
Household Income						
At/Below Poverty Level	REF			REF		
Above Poverty Level	0.745	0.719, 0.773	<0.001**	1.133	1.079, 1.189	<0.001**
HIV-Related Stigma						
High Negative Self-Image	0.874	0.842, 0.906	<0.001**	0.876	0.838, 0.915	<0.001**
Low Negative Self-Image	REF			REF		
High Personalized Stigma	1.951	1.859, 2.049	<0.001**	2.030	1.919, 2.148	<0.001**
Mod Personalized Stigma	1.134	1.090, 1.180	<0.001**	1.570	1.501, 1.643	<0.001**
Low Personalized Stigma	REF			REF		
High Anticipated Stigma	0.484	0.463, 0.507	<0.001**	0.500	0.474, 0.527	<0.001**
Mod Anticipated Stigma	0.476	0.455, 0.498	<0.001**	0.520	0.495, 0.547	<0.001**
Low Anticipated Stigma	REF			REF		
Type 3 Analysis of Effects						p
HIV-Related X Race Stigma Interactions						
Personalized Stigma X Race/Ethnicity						<0.001**
Negative Self-image X Race/Ethnicity						<0.001**
Anticipated Stigma X Race/Ethnicity						<0.001**

Note. REF = Reference group; [a]n = 771; weighted n = 89,889; *p < .05 **p <.01

Table 4.

Crude and adjusted odds ratios and 95% confidence intervals of HIV-related stigma subtypes on viral suppression

Variable	Model 1 (Crude)			Model 2 (adjusted)		
	OR	95% CI	P	AOR	95% CI	P
Gender						
Male	REF			REF		
Female	0.685	0.664, 0.707	<0.001**	0.837	0.805, 0.869	<0.001**
Age						
35-49	REF			REF		
18-34	0.428	0.409, 0.449	<0.001**	0.520	0.495, 0.547	<0.001**
50+	0.827	0.797, 0.857	<0.001**	0.763	0.734, 0.794	<0.001**
Education						
High School/Ged or Less	1.194	1.159, 1.230	<0.001**	1.083	1.046, 1.121	<0.001**
Some College or More	REF			REF		
Race/Ethnicity						
White	REF			REF		
Black	0.411	0.397, 0.426	<0.001**	0.394	0.378, 0.411	<0.001**
Hispanic	1.934	1.833, 2.043	<0.001**	1.779	1.682, 1.883	<0.001**
Sexual Orientation						
Heterosexual	REF			REF		
Not Heterosexual	1.614	1.565, 1.666	<0.001**	1.185	1.137, 1.234	<0.001**
Non-Injected Drug Use?						
No	REF			REF		
Yes	0.680	0.659, 0.703	<0.001**	0.698	0.674, 0.724	<0.001**
Binge Drinking?						
No	REF			REF		
Yes	0.708	0.679, 0.739	<0.001**	0.612	0.582, 0.643	<0.001**
Insurance						
Private	REF			REF		
Public	1.208	1.172, 1.245	<0.001**	1.252	1.205, 1.300	<0.001**
Household Income						
At/Below Poverty Level	REF			REF		
Above Poverty Level	0.987	0.957, 1.018	0.414	1.112	1.067, 1.158	<0.001**
HIV-Related Stigma						
High Negative Self-Image	0.690	0.670, 0.712	<0.001**	0.673	0.650, 0.697	<0.001**
Low Negative Self-Image	REF			REF		
High Personalized Stigma	1.089	1.049, 1.130	<0.001**	1.430	1.370, 1.493	<0.001**
Mod Personalized Stigma	1.135	1.097, 1.175	<0.001**	1.468	1.414, 1.525	<0.001**
Low Personalized Stigma	REF			REF		
High Anticipated Stigma	0.648	0.625, 0.671	<0.001**	0.943	0.904, 0.983	0.006**
Mod Anticipated Stigma	0.842	0.811, 0.873	<0.001**	1.00	0.961, 1.041	0.991
Low Anticipated Stigma	REF			REF		
Type 3 Analysis of Effects						P
HIV-Related x Race Stigma Interaction						
Personalized Stigma X Race/Ethnicity						<0.001**
Negative Self-image X Race/Ethnicity						<0.001**
Anticipated Stigma X Race/Ethnicity						<0.001**

Note. REF = Reference group; [a]n = 771; weighted n = 89,889; *p < .05 **p <.01.

Table 5.

Adjusted Odds Ratios and 95% Confidence Intervals HIV-Related Stigma Subtypes on Linkage to Care, Retention in Care, and Viral Suppression, Stratified by Race/ethnicity.

	Linkage to Care			Retention of Care			Viral Suppression		
Non-Hispanic White	OR	CI	P	AOR	CI	P	AOR	CI	P
High Negative Self-Image	1.328	1.248-1.413	<.001**	1.149	1.037-1.274	0.008**	0.410	0.379-0.443	<0.001**
Low Negative Self-Image	REF			REF			REF		
High Personalized Stigma	0.857	0.796-0.923	<.001**	6.077	5.215-7.115	<0.001**	3.182	2.900-3.493	<0.001**
Mod Personalized Stigma	0.968	0.907-1.032	0.317	2.879	2.621-3.166	<0.001**	3.459	3.185-3.757	<0.001**
Low Personalized Stigma	REF			REF			REF		
High Anticipated Stigma	1.140	1.055-1.232	0.001**	0.740	0.651-0.841	<0.001**	0.667	0.604-0.737	<0.001**
Mod Anticipated Stigma	1.107	1.040-1.178	0.001**	0.687	0.627-0.753	<0.001**	0.426	0.395-0.459	<0.001**
Low Anticipated Stigma	REF			REF			REF		
Non-Hispanic Black									
High Negative Self-Image	1.120	1.068-1.175	<.001**	0.651	0.617-0.686	<0.001**	0.599	0.573-0.626	<0.001**
Low Negative Self-Image	REF			REF			REF		
High Personalized Stigma	1.216	1.149-1.287	<.001**	1.394	1.304-1.492	<0.001**	1.036	0.982-1.093	0.194
Mod Personalized Stigma	0.785	0.745-0.827	<.001**	1.132	1.070-1.198	<0.001**	1.240	1.183-1.300	<0.001**
Low Personalized Stigma	REF			REF			REF		
High Anticipated Stigma	1.318	1.245-1.396	<.001**	0.475	0.445-0.507	<0.001**	0.951	0.904, 1.000	0.052
Mod Anticipated Stigma	2.346	2.216-2.484	<.001**	0.475	0.444-0.508	<0.001**	1.111	1.054-1.172	<0.001**
Low Anticipated Stigma	REF			REF			REF		
Hispanic									
High Negative Self-Image	0.935	0.861-1.015	0.109	7.199	5.642-9.258	<0.001**	1.420	1.250-1.615	<0.001**
Low Negative Self-Image	REF			REF			REF		
High Personalized Stigma	1.247	1.137-1.369	<.001**	1.660	1.197-2.314	0.003**	0.763	0.655-0.889	0.001**
Mod Personalized Stigma	0.606	0.559-0.657	<.001**	1.449	1.176-1.787	0.001**	0.481	0.427-0.543	<0.001**
Low Personalized Stigma	REF			REF			REF		
High Anticipated Stigma	0.816	0.748-0.889	<.001**	0.681	0.520-0.893	0.005**	2.377	2.076-2.727	<0.001**
Mod Anticipated Stigma	0.387	0.357-0.420	<.001**	0.223	0.185-0.268	<0.001**	2.509	2.208-2.857	<0.001**
Low Anticipated Stigma	REF			REF			REF		

Note. All covariates included in the unstratified models were included in the stratified models; [a]n = 771; weighted n = 89,889; *p < .05 **p <.01.

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PUBLICATIONS AND PRESENTATIONS

- Ramírez-Ortiz, D., Forney, D. J., Sheehan, D. M., Cano, M. Á., Romano, E., & Sánchez, M. (2021). Pre- and Post-immigration HIV Testing Behaviors among Young Adult Recent Latino Immigrants in Miami-Dade County, Florida. *AIDS and behavior*, 10.1007/s10461-021-03233-9. Advance online publication. https://doi.org/10.1007/s10461-021-03233-9

- Cano, M. Á., Marsiglia, F. F., Meca, A., De La Rosa, M., Ramírez-Ortiz, D., Sánchez, M., Colón Burgos, J. F., Alamilla, S. G., Wuyke, G., Parras, D., Ali, S. Z., Forney, D. J., Varas-Rodríguez, E., Ruvalcaba, Y., Contreras, A., Ahmed, S., Vega-Luna, B., Ochoa, L. G., Cuadra, R., & Domínguez García, M. J. (2021). Psychosocial stress, bicultural identity integration, and bicultural self-efficacy among Hispanic emerging adults. *Stress and health: Journal of the International Society for the Investigation of Stress*, *37*(2), 392–398. https://doi.org/10.1002/smi.2993

- Sanchez M., Sheehan D., & Forney D.J. (2019). HIV among Latino Immigrants in the United States: The Impact of Socio-Cultural Determinants of Health and Migration. In Diaz, Franch, Sacramento & Rojas Editor (Eds), *HIV/AIDS Migration and Human Rights: An Interdisciplinary Perspective* (pp. 105-136). Latina American Council of Social Sciences (CLASCO).

- Forney, D.J., Bhatt, C., Preston, S., Sanchez, M. (2018, April). Race/Ethnicity and Gender differences in HIV Testing among High School Adolescents in the United States: Results from the 2015 Youth Risk Behavior Surveillance System. Presented at the 2018 American Public Health Association Annual Meeting.