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The Effects of Ethnicity on Continuity of HIV Care Among Recent Jail Releasees

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The Effects of Ethnicity on Continuity of HIV Care Among Recent Jail Releasees

By

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Bachelor of Science

Clemson University

2009

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Abstract

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In the United States, Hispanic Americans are diagnosed with HIV at over three times the rate non-Hispanic Americans (25.0 per 100,000 people versus 8.2). With the cultural, linguistic, and legal barriers that exist for the Hispanic and foreign-born communities in the U.S., access to ongoing HIV care is difficult for this vulnerable population. The *EnhanceLink* project, a ten-site study of HIV-positive jail inmates, examined the effects of ethnicity on successfully being linked to HIV-related care, defined as having clinical monitoring of CD4 counts or viral load tests, upon release from jail. Twenty-five percent of study participants self-identified as Hispanic. Among all participants, the median age was 43 years old, 72% were male or transgender, 85% were born in the United States, and 21% self-identified as white. Overall, this population had high levels of unemployment (79%), low levels of high school completion (49%), and the median number of lifetime arrests was 15; however, approximately 75% had some form of health insurance or benefits in either the 30 days prior to incarceration or the 30 days prior to their 6 month follow-up interview. When stratifying on ethnicity, Hispanics were less likely to be born in the United States than non-Hispanics (42% versus 99%), more likely to have less than a high school diploma or GED equivalent than non-Hispanics (64% versus 47%). Hispanics were more likely to be male or transgender individuals than non-Hispanics (80% versus 69%). After adjusting for confounders and other variables of interest, successful linkage to care was not significantly associated with self-identifying as Hispanic (aOR = 0.96, 95% CI 0.63-1.45). Successful linkage to care was, however, positively associated with being male or transgender, increasing age, the needs of HIV-related medical care having been assessed, and the study site. More research needs to be done to better understand the unique challenges and advantages that the Hispanic community faces, especially among subpopulations affected by the criminal justice system.

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Chapter I: Literature Review

Introduction

The purpose of this literature review is to explore existing data and research regarding ethnicity (Hispanic or non-Hispanic) and healthcare-seeking behaviors among HIV-positive inmates and releasees. Specifically, we will examine whether or not ethnicity has an effect on HIV-positive inmates successfully linking to HIV maintenance programs in the community after release from jails and prisons. While research on this narrow topic is limited, rich literature exists on the topics of incarcerated populations, HIV/AIDS in incarcerated populations, HIV/AIDS in the Hispanic population, and Hispanic culture. This literature review will summarize and apply the findings on these broader topics to better understand and make inferences about the more specific topic outlined above, which is the main focus of this literature review.

Incarcerated Populations

Since the advent of the Rockefeller Drug Laws in 1973, the expansion of the U.S. criminal justice system has created a society of mass incarceration that heavily affects disadvantaged and vulnerable populations [1]. This system encompasses federal and state prisons, city and county jails, and non-institutional parole and probation programs. Currently, each year approximately 9 million people in the U.S. are admitted to jail, and at the end of 2011, approximately 1 in 34 American adults, 6.98 million people total, were being supervised by the adult correctional system in the United States [2, 3].

Disparities. In the United States, the populations that are affected by the criminal justice system are disproportionately affected by higher rates of various infectious diseases, low socioeconomic status, and drug use. Approximately one-third of hepatitis C and one-sixth of HIV cases in the U.S. funnel through a correctional facility in a given year, making

jails and prisons a unique place to provide testing, treatment, and ongoing care to curb these important and persistent public health problems [4-6].

Minorities. The U.S. correctional system has a disproportionately high population of minorities compared to the general U.S. population. African Americans comprise approximately 13% of the total U.S. population, but approximately 40% of the incarcerated population [7]; and Latinos comprise 16% of the U.S. population, but approximately 20% of the incarcerated population [8].

HIV/AIDS in Incarcerated Populations

In 2008, according to the Centers for Disease Control and Prevention (CDC), approximately 1.2 million people in the United States had HIV infection [9]. Because HIV is a chronic infection that can cause complications and can lead to AIDS, a continual spectrum of care is needed by the healthcare system to maintain control over symptoms and manifestations of the disease [10]. In order to improve survival and quality of life for those infected by HIV and to prevent further transmission to those who are uninfected, it is important that HIV-infected individuals seek ongoing and timely antiretroviral therapy [11, 12]. Correctional facilities are places where certain populations that are at high-risk for HIV/AIDS congregate; in 2006, approximately 16.9% of the U.S. population living with HIV/AIDS was in a correctional facility at some point during that calendar year [5]. Because incarcerated populations are fluid and frequently go in and out of the community, their access to healthcare can change as often as their incarceration status. This can disrupt ongoing antiretroviral therapy (ART) among inmates and recent releasees, which can compromise immunosuppression and lead to adverse clinical outcomes, making it a public health priority to ensure continuity of care for this vulnerable population [13].

Current Intervention Opportunities. Because the correctional system houses criminals, society rarely thinks of it as a place that needs philanthropic or public service programs. Most correctional-related funding is concentrated in security, and not ancillary areas such as healthcare. If more funding were concentrated in health initiatives, campaigns would be easily implemented because of the correctional system's existing network of controlled facilities. In order to achieve the goals of the National HIV/AIDS Strategy, engaging the correctional system in health care that is more connected with the outside community has become a priority in the U.S. [14]. The end goal, after identifying and treating an inmate who is HIV positive, is to engage the inmate in ongoing HIV care upon release back into the community. An observational cross-sectional study of the *EnhanceLink* research project, which collected data on and improved methods for linking HIV positive inmates to HIV primary care and social support services in the community after their release, reported that although the majority of inmates in the study were successfully linked to care, they were not virally suppressed at the end of the study [14]. Another analysis that was done with the *EnhanceLink* research project, that analyzed data from the first 30 days after the inmates' release, found that receiving HIV education in jail, completing a discharge plan, correctional staff awareness of the inmate's release date, and achieving stable housing by the 30th day post-release were all significantly associated with an increase in viral load suppression [15]. These studies reinforce that more efforts need to be concentrated in correctional facilities to improve linkage to care in the community after release. Strategies to develop more effective interventions in correctional settings are currently being researched based on this expanding and evolving knowledge base and research area [16].

Characteristics of the Hispanic Population

The Hispanic population is extremely dynamic and diverse, encompassing individuals of Mexican, Puerto Rican, Cuban, South and Central American, or other Spanish cultures or origins, regardless of their self-identified race [8]. Although they are often naively grouped together as one in the United States, the Hispanic population is as different and diverse as the regions from which they originate. As with other minorities in the United States, Hispanics disproportionately suffer from health and social disparities that both shape and define their unique culture within this country. Compared to the general U.S. population, Hispanics in the U.S. have higher poverty rates, lower household income, are less likely to have health insurance, hold fewer bachelor's degrees, and are less likely to be proficient in English, creating multiple barriers to effectively seeking ongoing HIV/AIDS care [8].

HIV/AIDS in the Hispanic Population

Since its discovery in the 1980s, HIV/AIDS has been socially stigmatized and associated with discrimination in all cultures it has affected, due to the nature of its transmission (sexual) and stereotypes of the population it affects (homosexuals). The Hispanic population is no exception to this. While people of all races and ethnicities are susceptible to HIV/AIDS, in the United States, it disproportionately affects the Hispanic population; in 2008, the annual rate of diagnosis for HIV infection among Hispanic Americans was approximately three times the annual rate in non-Hispanic Americans (25.0 per 100,000 persons versus 8.2) [17]. Andrés F. Henao-Martínez and José R. Castillo-Mancilla outlined five unique epidemiological characteristics and trends that describe HIV among Hispanics in the U.S., based on the fragmented clinical data that exists: 1) HIV infection disproportionately affects Hispanics, 2) there is a marked delay in the diagnosis of

HIV infection among Hispanics, 3) HIV risk factors differ among Hispanic groups, 4) immigration modifies the risk of HIV infection, and 5) there are particular medical issues to consider in the management of HIV-infected Hispanics, such as comorbidities that are highly prevalent among Hispanics [18]. These characteristics highlight basic facts that describe HIV in the Hispanic population, but also trends that are the direct results of multiple barriers that interfere with the Hispanic population receiving proper care.

Barriers. Cultural, linguistic, and legal barriers exist in the United States for Hispanic communities, which often widen the access gap and allow HIV/AIDS to continue to disproportionately affect Hispanics [17]. The list of barriers that stack up against the Hispanic population in the United States is long and perpetuates disparities in many different facets of their lives. Basic cultural barriers include acculturation, possible stresses from recent immigration (either personally or within their family), a lack of acceptance, and discrimination [19]. Linguistic barriers, involving one or more members of a family, can cause poor performance in an educational or occupational setting or can cause stress for a family member acting as a translator [8]. Being unable to communicate properly can bolster issues with access to health care and other public services, and can limit earning potential. Legal barriers, especially pertaining to a Hispanic immigrant's legal status, can prevent access from needed health care and can disqualify them from occupational opportunities. Not all of these barriers apply to every member of the Hispanic population in the U.S., but the vast majority of Hispanics have come across some of these barriers in some aspects of their lives.

Resiliency. While Henao-Martínez and Castillo-Mancilla frame these characteristics to be a major disadvantage to the Hispanic population, other researchers argue that Hispanic cultural characteristics offer a high level of resiliency that is protective against poor health outcomes. Despite well researched and thought out hypotheses stating that Hispanics

should have poorer health outcomes than non-Hispanic whites due to cultural disparities, researchers often observe a perplexing phenomenon known as the "Hispanic Paradox". The "Hispanic Paradox" states that despite the Hispanic population being less likely to have access to health care than the non-Hispanic population in the U.S., they have better measures of overall health than their counterparts [20]. Some researchers attribute this to Hispanics having lower rates of mental health disorders and positive mental health having a strong overall impact on physical health status [21]. Other factors that are specific to Hispanic culture and boost resiliency are *familism* and *allocentrism*, which are overlapping concepts that basically mean the needs of the group or family are more important than the needs of the individual. These factors create a strong sense of family support, which is a strong indicator of positive health outcomes [20].

Social Support. Social support is typically seen as an enabling factor for engagement in HIV care. However, because caring for an HIV-positive individual takes a holistic approach, it is debatable as to whether social support can be directly linked to engagement in HIV care, or if it is more associated with other aspects of caring for an HIV-positive patient, such as financial, housing, or emotional support. One study classified social support in two categories: 1) formal networks, which include professional support systems such as health care and social service providers, and 2) informal networks, which include family, friends, and other community organizations [19]. A qualitative study, which included analysis of 24 semi-structured in-depth interviews of HIV-positive Latino and African American men and women, found that most participants viewed HIV-specific care needs and general care needs as separate. This separation was strongly indicative of what type of social support they sought out for each need [19]. For HIV-specific care needs, study participants tended to turn to formal networks of social support, particularly health

professionals. For general care needs, participants relied on informal networks of social support, which usually consisted of family and friends, and sometimes included churches and other organizations [19]. Other sources of social support that were common among study participants and critical to ongoing HIV care were emotional, instrumental, and informational support. Emotional support was non-tangible but could be provided by formal or informal networks, while the latter two forms of support were typically only provided by formal networks [19].

Attitudes. To better understand the attitudes of the Hispanic community toward HIV, a qualitative study examined the perceptions and experiences of recently diagnosed HIV-positive Hispanic youth, concentrating on certain stressors or sources of support they had received since their diagnosis [22]. All participants reported being extremely hesitant or scared to disclose their status to family members, but most did feel that it was necessary to seek their support [22]. With peers, however, participants were reluctant to tell friends for fear of rejection and their HIV status usually remained a secret in their social circles [22]. Participants, especially those attending school, felt heavily stigmatized and worried about rejection and mistreatment by peers [22]. Other concerns that acted as barriers to treatment were fear of physical changes, fear of side effects from ART, reproductive health concerns, and disruption of future life goals [22]. Most of the coping mechanisms that were discussed involved internal attitude realignments to be more optimistic and turning toward spirituality; few coping mechanisms involving solely family and peer support were mentioned [22].

Another qualitative study, this one of formerly incarcerated Hispanic men, was conducted to better understand the actions and attitudes towards personal health [23]. Although this study only looked at attitudes towards overall health and not HIV/AIDS alone, the findings can be applied to attitudes toward HIV/AIDS. This study showed that

among Hispanic men there is a cultural desirability to be masculine, and that the participants' pride, or need to act masculine, was often a barrier toward achieving positive health behaviors [23]. Most study participants did not perceive risky health behaviors such as alcohol and drug use, HIV risk behaviors, and high caloric intake as problematic [23].

HIV/AIDS in Incarcerated Hispanics

As stated earlier, little regarding HIV/AIDS in incarcerated Hispanics has been published. The following summarizes the limited research to date on this topic. Linkage to care upon release from incarceration in this specific population is not discussed, however other helpful insights about this population have been explored.

Internal Disparities. The demographic composition and high prevalence of infectious disease in correctional populations highlight the disparities that exist between Hispanic and non-Hispanic populations in the U.S. In addition, within the correctional population, disparities exist between Hispanics and non-Hispanics. In federal prisons, Hispanic inmates have less than half the odds of being tested for HIV as non-Hispanic inmates [24]. Because Hispanics are not only disproportionately imprisoned in the U.S., but also underserved once incarcerated, a missed opportunity exists to target HIV-positive Hispanic inmates who need current treatment and future linkage to care [24].

Conclusion

The existing literature lacks specific studies about the impact of ethnicity on linkage to care among HIV-positive releasees. There are, however, multiple studies that highlight attitudes towards HIV/AIDS in the Hispanic community and how Hispanic releasees view health-related issues [19, 22, 23]. Some of the literature also presented opposing views as to

whether or not the cultural characteristics that define the Hispanic population should be seen as protective against or debilitating toward the Hispanic fight against HIV/AIDS [18, 20].

Inferences. Despite the possibility that Hispanic resiliency and the "Hispanic Paradox" could reasonably argue that Hispanic ethnicity positively affects successful linkage to care among recent HIV-positive releasees, the literature suggests that the Hispanic participants in the *EnhanceLink* study are less likely to be successfully linked to HIV-care upon release from jail because of the overwhelming amount of cultural barriers to their seeking care in the community.

Chapter II: Manuscript

The Effects of Ethnicity on Continuity of HIV Care Among Recent Jail Releasees

By Emily Ridgway

Abstract

In the United States, Hispanic Americans are diagnosed with HIV at over three times the rate non-Hispanic Americans (25.0 per 100,000 people versus 8.2). With the cultural, linguistic, and legal barriers that exist for the Hispanic and foreign-born communities in the U.S., access to ongoing HIV care is difficult for this vulnerable population. The *EnhanceLink* project, a ten-site study of HIV-positive jail inmates, examined the effects of ethnicity on successfully being linked to HIV-related care, defined as having clinical monitoring of CD4 counts or viral load tests, upon release from jail. Twenty-five percent of study participants self-identified as Hispanic. Among all participants, the median age was 43 years old, 72% were male or transgender, 85% were born in the United States, and 21% self-identified as white. Overall, this population had high levels of unemployment (79%), low levels of high school completion (49%), and the median number of lifetime arrests was 15; however, approximately 75% had some form of health insurance or benefits in either the 30 days prior to incarceration or the 30 days prior to their 6 month follow-up interview. When stratifying on ethnicity, Hispanics were less likely to be born in the United States than non-Hispanics (42% versus 99%), more likely to have less than a high school diploma or GED equivalent than non-Hispanics (64% versus 47%). Hispanics were more likely to be male or transgender individuals than non-Hispanics (80% versus 69%). After adjusting for confounders and other variables of interest, successful linkage to care was not significantly associated with self-identifying as Hispanic (aOR = 0.96, 95% CI 0.63-1.45). Successful linkage to care was, however, positively associated with being male or transgender, increasing age, the needs of HIV-related medical care having been assessed, and the study site. More

research needs to be done to better understand the unique challenges and advantages that the Hispanic community faces, especially among subpopulations affected by the criminal justice system.

Introduction

Correctional facilities are venues where populations that are at high-risk for HIV/AIDS and other infectious diseases are congregated. Approximately one-third of hepatitis C and one-sixth of HIV cases in the U.S. funnel through a correctional facility in a given year, making jails and prisons a unique place to provide testing, treatment, and ongoing care to mitigate these important and persistent public health problems [4-6]. Because incarcerated populations are fluid and frequently go in and out of the community, their access to healthcare can change as frequently as their incarceration status [13]. This can disrupt ongoing ART among inmates and recent releasees, which can compromise immunosuppression and lead to adverse clinical outcomes [10-13]. Ensuring continuity of care for this vulnerable population needs to be a priority [11, 12].

The primary goal in administering any correctional facility is maintaining a high level of security among criminals. Social programs, such as public health programs that address needs beyond basic medical care, may not be a high priority. However, paradoxically, correctional facilities can be fortuitous places for public health interventions due to the high concentration of persons at high risk for major public health problems in a controlled setting. In order to achieve the goals of the National HIV/AIDS Strategy, engaging the correctional system in the context of community-wide care has become a priority [14]. The end goal, after identifying and treating an inmate who is HIV positive, is to engage the inmate in ongoing HIV care upon release back into the community. Several studies have

been done that reinforce that more efforts need to be concentrated in correctional facilities to improve linkage to care in the community after release and strategies to develop more effective interventions in correctional settings are currently being researched based on this expanding and evolving knowledge base and research area [14-16].

While people of all races and ethnicities are susceptible to HIV/AIDS, it disproportionately affects the Hispanic population. In 2008, the annual rate of diagnosis for HIV infection among Hispanic Americans was approximately three times the annual rate in Non-Hispanic Americans (25.0 per 100,000 persons versus 8.2) [17]. Cultural, linguistic, and legal barriers exist in the United States for the Hispanic and foreign-born communities, which widen the access gap and allow HIV/AIDS to continue to disproportionately affect Hispanics [8, 17, 19, 25]. However, not all cultural differences among the Hispanic population should be seen as barriers; some Hispanic cultural characteristics, such as strong family support systems, may be beneficial to linkage to care for recent releasees and need further study [19-21]. The cultural characteristics that define different ethnic populations in the United States may contribute to different rates of linkage to HIV care upon release from prison among different ethnic groups in the correctional population.

Having regular measurements of CD4 counts and viral load are two ways of assessing the progression of HIV infection and whether ART has successfully suppressed the virus. Thus, documentation that these tests have been conducted is a good marker of regular ongoing care for HIV. In order to measure objectively whether a study participant was successfully linked to care in the 6 months after release from jail, we used the measurement of presence of CD4 count or viral load test in the subject's medical record within that period. Few studies have thoroughly examined access to HIV care within correctional facilities and whether or not continuation of care is achievable upon release. Even fewer

studies have looked at the association between linkage to care upon release from jail and ethnicity. The Enhancing Linkages to HIV Primary Care and Services to Jail Settings Initiative (*EnhanceLink*) is a Special Project of National Significance (SPNS) funded by the Health Resources and Services Administration (HRSA) and the HIV/AIDS Bureau (HAB) [16]. By analyzing data from *EnhanceLink*, a multisite research project of HIV-positive jail inmates, this study aims to explore the association between successful linkage to care among HIV positive inmates within 6 months after release from jail and Hispanic ethnicity.

Methods

Settings, Participants, and Data Collection

The purpose of the *EnhanceLink* initiative was to demonstrate models of excellence in linking HIV positive inmates to HIV primary care and social support services in the community after their release. Upon entry into jail, HIV-positive inmates at the 10 *EnhanceLink* sites nationwide were recruited for a longitudinal evaluation of their experience in the linkage to care programs. This study was approved by the Institutional Review Board of Emory University and Abt Associates. The existing approved IRB protocol for this project added my name, in an amendment, for access to the study data for analysis. All study participants signed informed consent forms prior to participation in the study. The cohort included male, female, and transgender HIV-infected inmates. The study sites included 20 jail facilities in Atlanta, GA; the Chester, PA region; Chicago, IL; Cleveland, OH; Columbia, SC; New Haven, CT; New York, NY; Philadelphia, PA; the Providence, RI region; and Springfield, MA. Each site had varying criteria for enrollment into the study, but all sites required that subjects be 18 years of age or older.

For each of the 1,270 men, women, and transgender individuals that were recruited for the longitudinal study, data were collected throughout the entire spectrum of linkage to care, from the beginning of the index incarceration until six months post release from jail. Collection dates were from 2008 and October 2011. Information sources were surveys of participants and medical chart reviews. Data were then entered into a common data management system (DMS) that served all ten study sites. After initial enrollment, *EnhanceLink* staff conducted an extensive Baseline Client Interview that asked questions about demographic characteristics, physical health, mental health, social health and well-being, drug and alcohol use, HIV care status, availability of housing and financial resources outside of jail, education level, employment status, and criminal justice history. Upon release, evaluation staff extracted data from jail medical charts and summarized progress in case management at 30 days post release. A second face-to-face survey was conducted 6 months post release that contained elements similar to that in the baseline survey, but reflected changes in behaviors and health statuses. Program staff reviewed medical and laboratory records from their community based clinics at approximately 6 months post release.

Variables Used in Analysis

The exposure of interest is ethnicity, identified as Hispanic or non-Hispanic.

The outcome of interest is successful linkage to care upon release from jail, defined as the presence of a CD4 count or a viral load test (or both) in their extracted medical record at 6 months post release. Any study participants missing data for their Follow-up Chart Review were assumed to be lost to follow-up and therefore classified as not linked to care.

Other variables analyzed include race, gender, age, primary language spoken, education level, income level, employment status, health insurance status, assessment of HIV-related care needs, level of stress over family problems, and level of satisfaction from family support. Potential confounding variables are nativity (country of birth) and study site.

Statistical Analysis

Primary data analysis was conducted on baseline characteristics of the entire study population and then comparing Hispanic versus non-Hispanic study participants. Univariate logistic regression was performed on the outcome of interest, linkage to care, to determine the unadjusted odds ratios for (categorical and continuous) variables of interest, for all study participants with data on ethnicity (see Figure 1). Multivariate logistic regression was performed on the outcome of interest to determine the adjusted odds ratios for exposures of interest, with confounders included in the analysis for all study participants with data on ethnicity. All statistical analyses were performed using SAS 9.3 (SAS Institute Inc., Cary, North Carolina).

Results

Baseline Description

The baseline characteristics for the 1,270 *EnhanceLink* study participants are outlined in Table 1. Of the 1,227 study participants who had data on ethnicity, 25% self-identified their ethnicity as Hispanic. Seventy-two percent of the participants were male or transgender; the experience of all transgender individuals (n = 26) was analyzed in combination with male gender category for confidentiality purposes. Approximately 21% of the study population

self-identified their race as white. Eighty-five percent of study participants were born within the United States. The mean age for the study population was 43 years.

No single variable exists in the *EnhanceLink* dataset that measures socioeconomic status (SES), however there are multiple variables that contribute to an understanding of a study participants' overall SES, including education level, employment status, income level, and health insurance status. Fifty-one percent of the study participants had less than a high school diploma or GED equivalent at the baseline interview. At baseline, only 21% had been paid for work in the 30 days prior to incarceration, yet 66% had an income of at least $500 in that 30-day period. A study participant was considered to have some health insurance or benefits if they reported having these benefits either at the baseline interview or at the 6-month follow-up interview; 75% of study participants reported having some health insurance or benefits at either one or both of these two points in time.

Multiple variables measured criminal justice history at the baseline interview. Seventy percent of study participants had been incarcerated for at least 2 years overall in their lifetime. The median age at first incarceration was 19 years and the median number of lifetime arrests was 15 arrests.

Baseline Differences by Ethnicity

Table 1 reports the baseline characteristics stratified by Hispanic (n = 306) and non-Hispanic (n = 921) status for the 1,227 *EnhanceLink* study participants who had information available on ethnicity. Eighty percent of those self-identifying as Hispanic were male or transgender, compared to 69% of non-Hispanics. Twenty-five percent of the Hispanics and 20% of the non-Hispanics self-identified their race as white. Fifty-eight percent of the Hispanics and 1% of the non-Hispanics were foreign-born. For education, 64% of Hispanics and 47% of

non-Hispanics had less than a high school diploma or GED equivalent. Eighty-seven percent of Hispanics and only 71% of non-Hispanics had some health insurance or benefits at either the baseline interview or the 6-month follow-up interview, or both. Only 14% of Hispanics and 23% of non-Hispanics reported being paid for work in the 30 days prior to incarceration, while inversely 72% of Hispanics and 65% of non-Hispanics reported an income of at least $500 or more in the same 30-day period. All of the variables regarding age and criminal justice history were similar between Hispanics and non-Hispanics.

Factors Associated with Linkage to Care

Table 2 examines the univariate association between the outcome of linkage to care and the exposure of ethnicity, as well as other variables of interest and potential confounding variables, for study participants with data on ethnicity (n = 1227). Being male or transgender was significantly associated with successful linkage to care (OR = 1.63, 95% CI 1.27-2.10). Age was significantly associated with the outcome, with older age groups having a higher likelihood of successfully being linked to care upon release than younger age groups (OR [30-39] = 1.66, 95% CI 1.08, 2.56; OR [40-49] = 2.03, 95% CI 1.36, 3.02; OR [50+] = 2.24, 95% CI 1.45, 3.46). Having some form of health insurance or benefits in the past 6 months was significantly associated with being successfully linked to care (OR = 1.56, 95% CI 1.20-2.03). Being employed (paid for work in the 30 days prior to incarceration) was actually significantly associated with *not* being linked to care upon release (OR = 0.69, 95% CI 0.52-0.92). Having a needs assessment done for HIV-related medical services prior to release was significantly associated with successfully being linked to care (OR = 3.37, 95% CI 2.66-4.27). Study site was a potential confounding variable significantly associated with linkage to care. With Site #1 as the referent site for calculating odds ratios, all sites had significantly

increased odds of a study participant being successfully linked to HIV care upon release on univariate analysis. As noted at the bottom of Table 2, Site #1 only has female study participants, which was taken into consideration when analyzing the data. Associations that were not considered statistically significant with linkage were ethnicity, race, level bothered by family problems, level of satisfaction from overall family support, education level, income level, English as primary language, and nativity (a potential confounder).

An appropriate model was constructed and analyzed for multiple logistic regression, and the adjusted odds ratios and corresponding 95% confidence intervals for the final reduced model are presented in Table 3. Using backward elimination to form the reduced model, the following variables were dropped: race, education level, income level, employment status, level of stress over family problems, and level of satisfaction from family support. Again, being male or transgender was significantly associated with successful linkage to care, with the magnitude of the association decreasing slightly compared to the unadjusted odds ratio (aOR = 1.41, 95% CI 1.03-1.93). With a stronger magnitude of association than the unadjusted odds ratio, age was also significantly associated with the outcome again, with older age groups having higher adjusted odds of successfully being linked to care upon release than younger age groups. Having been assessed for HIV-related medical needs was significantly associated with successful linkage to care again, with an increased magnitude of association compared to the unadjusted odds ratio (aOR = 4.67, 95% CI 3.55-6.15). The adjusted odds ratios for sites changed in different directions depending on site. With Site #1 as the referent site, all other sites were significantly associated with successful linkage to care again, except Site #4. Although nativity was determined to be a confounder, and therefore controlled for in the model, it did not show that there was a statistically significant association between being U.S-born and being successfully linked to care (aOR = 0.99, 95%

CI 0.60-1.66). Hispanic ethnicity was not significantly associated with being successfully linked to care when controlling for other variables of interest in multivariate analysis (aOR = 0.96, 95% CI 0.63-1.45).

Discussion

In this study, HIV-positive inmates that self-identified as Hispanic represented a substantial minority group of 25% of the overall study population of jail detainees. Although the baseline demographic characteristics in Table 1 showed subtle differences in socioeconomic status (SES) characteristics, including education, employment, income, and health insurance, and a significant difference in U.S. nativity rates between Hispanics and non-Hispanics, there may be a mix of underlying advantages and disadvantages that affect each group.

This study shows that as age increases, rates of being linked to care after release also increase. There are several factors that could explain this association. It could simply be a matter of gaining maturity and taking responsibility over health-related issues, or it could have to do with the length of time since diagnosis, in that those who have had HIV for longer may have more advanced stages of disease and require ongoing care. Being male or transgender was significantly associated with successful linkage to care and the Hispanic population had a higher percentage of male or transgender inmates. Because females were significantly less likely to be linked to care upon release and the Hispanic population had a smaller portion of females, the rate of linkage to care among HIV-positive Hispanic inmates was likely positively affected. Gender differences in linkage to care can also explain the low rates of linkage to care at Site #1, as it was an all female study site.

As indicated by the literature, a major predictor of successful linkage to care was whether or not an assessment for HIV-related medical needs was performed with the study

participant prior to release [26]. This was included in the analysis and backs up the existing literature that it is in fact a significant predictor of successful linkage to care, even when taking ethnicity into account.

One peripheral subject area explored with relation to ethnicity in this study was whether different ethnicities experienced different levels of family support. This concept was measured by two variables in the univariate analysis: the level at which an individual was bothered by family problems in the 30 days prior to incarceration and the level of satisfaction an individual experienced from overall support from family and friends in the 30 days prior to incarceration. Some literature supports the idea that Hispanic culture fosters strong support among family and friends. Greater family support among Hispanic participants, as measured by these two variables, was expected, which would lead to higher levels of linkage to care [19-21]. When these two self-reported variables were analyzed, they were not statistically significant. Conceptually one's subjective level of satisfaction or bother may not be a good measure of whether or not they have strong family support, but rather a measure of how they perceive support from their family and friends, which is effected by their cultural norms.

Strengths

This study showed that jails and other correctional facilities are important places to increase engagement in long-term HIV medical care. The results of this study add to the limited understanding of whether or not ethnicity affects successful linkage to HIV-related care. While some literature about the "Hispanic Paradox", which states that despite the Hispanic population being less likely to have access to health care than the non-Hispanic population in the U.S., they have better measures of overall health than their counterparts, would back

up Hispanics having higher levels of successful linkage to care, other literature highlights the many disadvantages that face the Hispanic and foreign-born populations in the United States and would support lower levels of successful linkage to care [8, 17-21]. The results of this study support that potential characteristics that are unique to the Hispanic population may help to overcome disadvantages, yielding health access and outcomes that are comparable to the non-Hispanic population.

Limitations

A major limitation of this study is that the study population is a convenience sample. Using a convenience sample limits our ability to generalize our findings to the to the entire target population and make accurate implications regarding our study findings.

Due to the survey-based nature of this study, the data analysis was limited by self-reporting on baseline demographic information and characteristics, such as race and ethnicity. The difference between race and ethnicity may be poorly understood, and how the different options for each are defined [8]. For example the majority of free-text responses that were filled in for "Other" under race could have been correctly classified as one of the existing race options, but because a study participant did not self-identify as that race, it was not properly notated. Because the design of this study is observational, without a control group, we are limited in drawing conclusions and inferences about case management and ongoing care-seeking behaviors.

Another limitation is assuming that not having a record of a CD4 count or viral load test on the 6 month follow-up interview means that that study participant was not linked to care. The study participants lost to follow-up before the 6 month follow-up interview may have

actually been linked to care outside of this study, but because we had no record of this, they were assumed to be unlinked to care.

Although there may have been significant differences, the different study sites were not characterized or categorized by the strength of their jail-based and post-release linkage programs or their level of cultural competency when dealing with Hispanic participants. Being unable to account for these differences is limiting in our interpretation of the data; for example, some sites with larger Hispanic populations might have had a Spanish-speaker on staff to conduct interviews with Spanish-speaking clients, giving their study population an advantage over the site with a smaller Hispanic population and no one on staff who spoke Spanish.

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Figures & Tables

Figure 1 Participants in EnhanceLink study of linkage to HIV care after release from jail considered in analysis of the predictor of Ethnicity

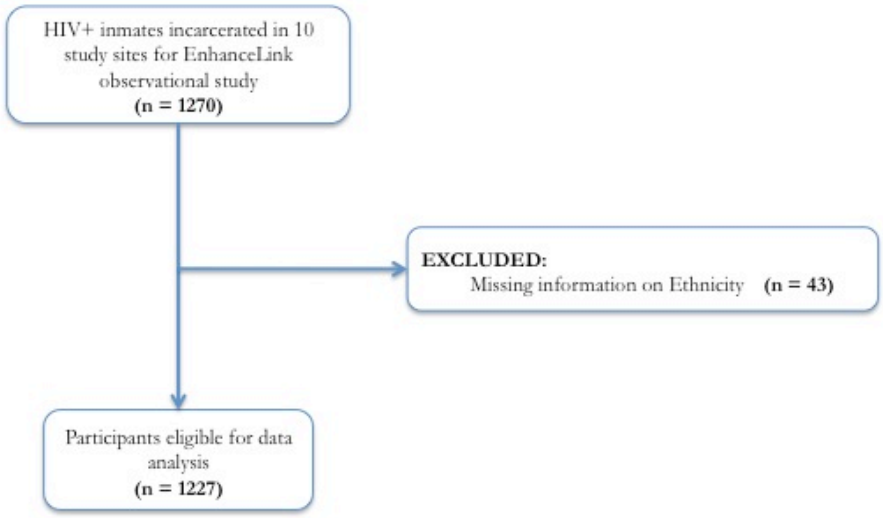

Table 1 Characteristics of HIV-positve study participants at baseline or 6 month follow-up

	All participants		Participants with data on ethnicity (n = 1227)			
			Hispanic		non-Hispanic	
	n = 1270	Missing	n = 306	Missing	n = 921	Missing
	N (%)	*N*	N (%)	*N*	N (%)	*N*
Gender		20		0		1
Male or Transgender	900 (72.0)		245 (80.1)		633 (68.8)	
Race		37		16		1
White	263 (21.3)		73 (25.2)		187 (20.3)	
Nativity		25		0		6
United States	1053 (84.6)		127 (41.5)		903 (98.7)	
Education (at baseline)		26		0		7
Less than a high school diploma/GED	633 (50.9)		195 (63.7)		427 (46.7)	
Health Insurance (at baseline or 6 month follow-up)		27		1		8
Some health insurance or benefits reported	928 (74.7)		266 (87.2)		646 (70.8)	
Employment (at baseline)		51		11		20
Paid for work in 30 days prior to jail	251 (20.6)		42 (14.2)		204 (22.6)	
Income (at baseline)		101		23		57
Total income in 30 days prior to jail, ≥ $500	771 (66.0)		203 (71.7)		557 (64.5)	
Criminal Justice History (at baseline)		43		4		20
Incarerated for ≥2 years in lifetime	861 (70.2)		217 (71.9)		628 (69.7)	
	Median [S.D.]	*N*	Median [S.D.]	*N*	Median [S.D.]	*N*
Age (at baseline)		21		1		4
Median current age	43.0 [9.1]		43.0 [8.8]		43.0 [9.2]	
Criminal Justice History (at baseline)		110		11		79
Median number of lifetime arrests	15.0 [25.6]		13.0 [24.3]		15.0 [26.2]	
Criminal Justice History (at baseline)		93		18		54
Median age at first incarceration	19.0 [7.4]		19.0 [7.3]		18.0 [7.5]	

Table 2 Univariate analysis of factors associated with successful linkage to care among HIV-positive jail inmates with data on Ethnicity (n=1227)

	Unadjusted OR	95% CI
Exposure of Interest		
Ethnicity		
Hispanic	1.15	(0.89, 1.49)
non-Hispanic	Ref	
Other Variables of Interest		
Gender		
Male or Transgender**	1.63	(1.27, 2.10)*
Female	Ref	
Race		
White	1.11	(0.84, 1.46)
non-White	Ref	
Age		
18 - 29	Ref	
30 - 39	1.66	(1.08, 2.56)*
40 - 49	2.03	(1.36, 3.02)*
50 +	2.24	(1.45, 3.46)*
Level bothered by family problems in past 30 day		
Not at all	1.38	(1.00, 1.90)
Slightly	1.41	(0.94, 2.12)
Moderately	1.29	(0.84, 1.97)
Considerably	1.38	(0.89, 2.13)
Extremely	Ref	
Level of satisfaction from overall support from family and friends		
Very dissatisfied	1.33	(0.85, 2.06)
Somewhat dissatisfied	Ref	
Neither satisfied or dissatisfied	1.33	(0.86, 2.05)
Somewhat satisfied	1.37	(0.93, 2.01)
Very satisfied	1.32	(0.91, 1.93)
Education--Has high school diploma/GED or higher		
Yes	1.22	(0.98, 1.53)
No	Ref	
Health Insurance--Some hlth ins./benefits in past 6 months		
Yes	1.56	(1.20, 2.03)*
No	Ref	
Employment--Paid for work in past 30 days (BLN)		
Yes	0.69	(0.52, 0.92)*
No	Ref	
Income--Total income in past 30 days, ≥ $500 (BLN)		
Yes	1.03	(0.81, 1.31)
No	Ref	
Need for HIV-related medical service was assessed		
Yes	3.37	(2.66, 4.27)*
No	Ref	
Language--English as Primary Language		
Yes	0.87	(0.60, 1.25)
No	Ref	
Potential Confounding Variables		
Study Site		
Site #1***	Ref	
Site #2	3.74	(1.84, 7.59)*
Site #3	3.96	(1.89, 8.28)*
Site #4	4.17	(1.87, 9.26)*
Site #5	4.54	(2.13, 9.65)*
Site #6	5.83	(2.49, 13.66)*
Site #7	5.94	(2.90, 12.15)*
Site #8	6.23	(3.29, 11.79)*
Site #9	7.58	(3.49, 16.46)*
Site #10	26.24	(11.30, 60.94)*
Nativity		
U.S.-born	0.82	(0.60, 1.11)
Foreign-born	Ref	

* Denotes statistically significant confidence interval

** Transgender individuals were grouped with male individuals for confidentiality purposes

*** All Site #1 study participants are female

Table 3 Multivariate analysis of factors associated with successful linkage to care among HIV-positive jail inmates with data on Ethnicity (n=1227)

	Adjusted OR	95% CI
Exposure of Interest		
Ethnicity		
Hispanic	0.96	(0.63, 1.45)
non-Hispanic	Ref	
Other Variables of Interest		
Gender		
Male or Transgender**	1.41	(1.03, 1.93)*
Female	Ref	
Age		
18 - 29	Ref	
30 - 39	1.98	(1.21, 3.24)*
40 - 49	2.31	(1.46, 3.66)*
50 +	2.57	(1.55, 4.27)*
Health Insurance--Some hlth ins./benefits in past 6 months		
Yes	1.21	(0.86, 1.72)
No	Ref	
Need for HIV-related medical service was assessed		
Yes	4.67	(3.55, 6.15)*
No	Ref	
Language--English as Primary Language		
Yes	1.16	(0.68, 1.98)
No	Ref	
Potential Confounding Variables		
Study Site		
Site #1***	Ref	
Site #2	2.44	(1.10, 5.43)*
Site #3	4.44	(1.94, 10.15)*
Site #4	2.44	(0.99, 6.01)
Site #5	2.65	(1.14, 6.18)*
Site #6	3.81	(1.50, 9.70)*
Site #7	4.28	(1.91, 9.58)*
Site #8	3.15	(1.52, 6.51)*
Site #9	5.80	(2.37, 14.23)*
Site #10	41.29	(16.45, 103.63)*
Nativity		
U.S.-born	0.99	(0.60, 1.66)
Foreign-born	Ref	

* Denotes statistically significant confidence interval

** Transgender individuals were grouped with male individuals for confidentiality purposes

*** All Site #1 study participants are female

Chapter III: Conclusion

Summary

This study shows that despite the unique disadvantages that face the Hispanic population in the U.S., the HIV-positive Hispanic inmates in this study were able to link themselves to HIV-related care after release from jail at comparable rates to the HIV-positive non-Hispanic inmates. While the Hispanic culture may have characteristics that are seen as advantageous in seeking ongoing HIV care, such as strong family support, this study did not show those characteristics, as they were measured in this study, to be significantly more prevalent or to cause a significant advantage in being linked to care among Hispanics versus non-Hispanics.

Public Health Implications

This study contributes to the existing literature by showing that, despite the unique disadvantages that face the Hispanic population in the U.S., programs in correctional facilities that help link HIV-positive inmates to care upon release demonstrate that Hispanics are linked to care at comparable rates as non-Hispanics.

Possible Future Directions

More research is needed to better describe, through qualitative data collection, the unique advantages and disadvantages that face the Hispanic and non-Hispanic communities, specifically as it pertains to the fight against HIV/AIDS. It would be interesting to study the outreach methods and procedures that were practiced at each individual site, as some sites may have better catered to the special needs of the Hispanic community. If research can help the public to better understand the unique cultural disadvantages that become barriers

to seeking care, then prevention and continuing care programs can be tailored to overcome those barriers for their target population.