



A Critical Review and Commentary on the Challenges in Engaging HIV-Infected Latinos in the Continuum of HIV Care

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Abstract

Antiretroviral therapy for treatment of HIV infection has become increasingly effective. Persistent poor HIV outcomes in racial and ethnic minority populations in the US call for a closer examination into why Latinos are at significant risk for acquiring and dying from HIV. To improve clinical outcomes and achieve an AIDS-free generation, HIV research must address disparities in HIV outcomes in Latinos, the largest ethnic/racial minority population in the US. Immigrant status as well as cultural factors influence HIV care utilization and are essential to highlight for effective intervention development in Latinos. A better understanding of these individual and contextual factors is critical to developing tailored approaches to engaging Latinos in HIV care. Based on a comprehensive literature review, we offer a framework for understanding what is needed from clinical practice and research to improve engagement in HIV care for US-based Latinos. These findings may have implications for other minority populations.

Keywords Latinos · HIV/AIDS · Access to care · Adherence · Engagement in care

Resumen

Mientras la eficacia del tratamiento antirretroviral del VIH aumenta, resultados pobres en minoridades raciales y étnicas en los EEUU requieren una examinación sobre por qué los Latinos tienen un riesgo significativo de adquirir y morir del VIH. Para mejorar resultados clínicos y alcanzar una generación libre del SIDA, investigaciones deben abordar las disparidades en resultados de Latinos con VIH, la minoría étnica/racial más grande de los EEUU. Ser inmigrante más factores culturales influyen en el cuidado de VIH, haciendo imperativo resaltarlos para desarrollar intervenciones eficaces para Latinos. Un mejor entendimiento de factores contextuales e individuales es crítico para crear métodos de engranaje para Latinos en el cuidado de VIH. Basado en una revisión bibliográfica comprensiva, ofrecemos un marco para entender lo requerido de práctica clínica e investigaciones para mejorar la participación en cuidado del VIH de Latinos en los EEUU, lo cual puede implicarse para otras minoridades.

Introduction

Addressing barriers along the HIV care cascade for Latinos is key to achieving an AIDS free generation [1]. In the US, there are 56.5 million Latinos/Hispanics who comprise

17.6% of the population [2]. Yet HIV/AIDS has disproportionately affected Latino populations. Of the number of foreign-born persons diagnosed with HIV from 2007 to 2010 in the US, 42.2% were Latino, which is higher than the 34.4% who comprise foreign-born Latinos in the US [2, 3]. Gay and bisexual men who have sex with men (MSM) represent 82.8% of new HIV infections in male Latinos [4]. Place of birth is a crucial mediator of HIV risk, health care utilization, and health outcomes due to ease of accessing services for those with US residency. Educational level and health behaviors are also associated with country of origin; yet few studies disaggregate HIV outcomes for Latinos based on nativity [3, 5–8].

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Once infected, Latinos experience disproportionately poorer clinical outcomes compared with non-Latino whites. This disparity represents a confluence of under-specified and unaddressed risk factors. The US Department of Health and Human Services recommends routine voluntary HIV testing for all adolescents and adults age 13–64 years [9]. Despite this imperative, Latinos present with more advanced HIV disease at diagnosis [6, 10, 11]. Furthermore, there is significant attrition from HIV care after diagnosis [12]. An analysis of data from the National HIV Surveillance System and Medical Monitoring Project found that 83.9% of HIV-infected Latinos were linked to care within 3 months of HIV diagnosis, compared with 87.1% in non-Latino whites [13]. Nearly 60% of HIV-infected Latinos were retained in care, measured by ≥ 2 CD4 or viral load tests performed at least 3 months apart in 2013 [13]. In 2009, the proportion of HIV-infected prescribed antiretroviral therapy (ART) was 89% in Latinos and 92% in non-Latino whites [14]. By 2013 this disparity was no longer statistically significant [14]. By 2013, 81% of Latinos and 86% of non-Latino whites achieved virologic suppression, a statistically significant disparity [14].

Despite socioeconomic risk factors for poor health outcomes (i.e. high rates of poverty and low education), Latinos have good health profiles (e.g. life expectancy, birth weight, mortality from cancer). This is often described as the Latino health paradox [15, 16]. That HIV is one of the few conditions where outcomes in Latinos are worse than in non-Latino whites, as reflected in HIV incidence and death rates, reflects an important unaddressed health disparity. For example, in 2014, the rate of new HIV infections in Latinos was three times higher than in non-Latino whites, 18.4 cases per 100,000 persons compared with 6.1 for whites [17]. When disaggregated by gender, the HIV incidence rate in Latino males was 3.2 times higher than in non-Latino white males and 3.8 times higher in Latina females compared with non-Latina white females [17]. In 2014, the death rate from HIV was 4.9 per 100,000 persons in Latinos compared with 2.5 in non-Latino whites [17]. Evaluating risk factors that influence HIV outcomes in Latinos as well as community and individual assets could offer insight into overcoming these disparities.

Through a comprehensive literature search our intent is to identify key unaddressed components in the HIV care continuum that impinge upon adequate engagement in HIV care for Latinos. We review established models of HIV care utilization and identify factors relevant to Latino populations. We evaluate factors at the level of the patient, provider and clinic, and health system and society that are relevant to successful engagement for Latinos at each stage of HIV care (i.e. HIV diagnosis, linkage to HIV care, retention in HIV care, adherence to ART, and viral suppression). We use this platform to envision what is needed to improve HIV

outcomes and halt HIV transmission through research and clinical care.

HIV Models of Care

Traditionally, health services research measured HIV outcomes by “number of patients in primary care” or “quality of care”, but these terms did not reflect longitudinal aspects in HIV care, such as retention in care, ART adherence, or viral suppression [18]. In 2001, the Health Resources and Services Administration (HRSA) launched a five-year program to expand strategies to improve outreach to HIV-infected individuals out of care [19]. These multi-site demonstration projects led to a more nuanced appreciation of the complex patterns of patient engagement in HIV care. In 2010, the National HIV/AIDS Strategy delineated specific indicators of effective HIV care: HIV diagnosis, linkage to care, retention in care, ART prescription and adherence, and viral suppression [20]. The model of the HIV care continuum contains a series of bidirectional steps where HIV-infected individuals can transition between “not in care” to “fully engaged in care” [21].

Mugavero and colleagues created a socioecological framework of HIV care utilization that is informed by concepts from the Andersen Model of Healthcare Utilization and the Information Motivation Behavioral Skills Model [22–24]. In this model, factors that influence the process of engagement in HIV care fall under individual, interpersonal, community, health care system, and policy levels. The model emphasizes the concept of “churn”, where individuals continuously cycle in and out of HIV care [25].

Factors that relate to migration and acculturation influence health service utilization in Latinos and are relevant to highlight in HIV care. Nearly 35% of US-based Latinos are foreign-born and a rising proportion of island-born Puerto Ricans have migrated to the US mainland [2, 26, 27]. The Behavioral Model for Vulnerable Populations builds upon the Andersen Model of Healthcare Utilization to examine access to care for minorities, including undocumented immigrants [28]. Yang and Hang also offer an expanded conceptual model of the Andersen model of health service utilization accounting for both general and immigrant specific factors to explain disparities in health service utilization for immigrants compared with native-born persons [29]. In this model, the macrostructural or contextual level includes the context of emigration and reception in the host country. Predisposing factors include immigration status and assimilation in the host society. Enabling factors center on financial and social resources from the homeland as well as transnational access to health care after migration. Immigrant specific health conditions and needs mediate the evaluated and perceived need for health care.

We emphasize factors specific to the stages of the HIV care continuum with the understanding that a number of factors are relevant across the care continuum at the level of the patient (e.g. acculturation, stigma around HIV and sexual orientation, self-efficacy); provider and clinic (e.g. quality of patient-provider relationship, cultural competency); and health system and society (e.g. access to health services, insurance status, laws and policy).

Methods

Database and Search Strategy

We used the following representative keywords and medical subject headings (MESH) terms to identify relevant articles to engagement in HIV care for Latinos: Latino, Hispanic, HIV/AIDS, care cascade, care continuum, HIV conceptual models, Ryan White, insurance, Affordable Care Act, barriers to health care, barriers to HIV care, social and structural factors, geographic factors, disparities, non-English language proficiency, HIV testing, HIV diagnosis, HIV prevention, HIV risk behavior, antiretroviral adherence, retention in care, HIV outcomes, mortality, cultural factors, machismo, marianismo, fatalism, familism, health beliefs, self-efficacy, social support, patient activation, acculturation, stigma, HIV knowledge, HIV education, health state, health literacy, substance/drug use, injection drug use, men who have sex with men, young men who have sex with men, LGBT, sexual and gender identity, gender, country of origin, immigrant/foreign-born, migrant, behavioral interventions, financial incentives, community health workers, health communication, patient-provider communication, HIV provider characteristics, mobile device, digital device, digital health, smart phone, eHealth, mHealth, iHealth, social media, social network, shared decision making, clinical trial, randomized trial, observational, cohort, NA-ACCORD, CNICS, CDC, review, epidemiology, qualitative, and narrative.

We applied these search terms to electronic databases of PubMed, MEDLINE (Ovid), PsycINFO (Ovid), Google Scholar, and Harvard Discovery database for a broader range of sources. We limited the search to English or Spanish language publications from peer-reviewed journals. References focused on primary research articles relating to Latinos/Hispanics with HIV and were published after January 2010 to emphasize more recent research contributions. However, we included older seminal work particularly in areas that were understudied or were foundational references.

Results

HIV Testing and Diagnosis

Patient-Level Factors

Lower HIV testing in Latinos varies by sub-ethnic group affiliation (i.e. Mexican and Mexican–American groups), low educational level, male gender, and low self-perceived HIV risk [30, 31]. Lopez-Quintero also found that married Latinos displayed lower intentions for HIV testing, which may relate to traditional conceptions of gender and sexual identity and assumptions around marital fidelity [30].

Cultural factors influence HIV testing in Latinos. *Familismo* (or family pride) can be associated with reluctance for Latinos to discuss sex and sexual identity. As well, strict cultural norms on sexuality and gender roles can limit the capacity and awareness for uptake of HIV testing [32–34]. Social reluctance to discuss sexuality, prevention of sexually transmitted infections, sexual roles or attitudes in Latinas limits their ability to address HIV risks [35]. *Marianismo* is a traditional female gender role in Latino culture that idealizes sexual purity and passivity. Women who subscribe to concepts of *marianismo* may not discuss safer sex with their male partners for fear of abuse, withdrawal of financial support, or fear of being perceived as promiscuous. This behavior may decrease willingness to undergo HIV testing in Latinas [36]. In a survey of 413 predominantly Mexican–American pregnant women in Texas, women were less likely to undergo HIV testing if they perceived testing as a reflection of sexual promiscuity or of injection drug use, endorsed a fatalistic perspective, and feared social consequences of a positive test result (e.g. withdrawal of financial support and affection) [37].

Social pressure for Latino men to conform to traditional gender roles can limit Latino males from prioritizing HIV testing for fear of the social repercussions of having the disease [38]. Research around cultural sexual norms in Latino MSM relate self-perceived risk for HIV and perceived need for HIV testing [39, 40]. More recent research examines Latino masculinity and sexual risk and extends prior understandings of Latino male willingness for HIV testing [41–44].

Acculturation is the psychological and behavioral change that results from contact with another culture [45]. Lopez-Quintero found that individuals with lower acculturation scores harbored lower intentions for HIV testing [30]. Values such as *respeto* that encourage deference to authority figures, as well as low activation and English language skills, can limit Latino patients from requesting HIV testing when not offered by their provider [31, 46]. In a sample of 608 Latino MSM in Miami-Dade County and

New York City, those most likely to avoid HIV testing did not disclose their sexual identity to their provider, which may reflect a confluence of cultural factors, such as not challenging authority figures, sensitivity around traditional gender roles, and language barriers [38].

Provider and Clinic-Level Factors

A significant predictor of the intention for HIV testing in Latinos is whether the health care provider offers the test [30, 47]. A CDC analysis of the 2009–2012 National Ambulatory Medical Care Survey of males aged 15–39, a high risk group for HIV, demonstrated that 1.0% of health care visits to physicians' offices included an HIV test [48]. In a nationally representative sample of 17,848 Latinos, 50% reported receiving an HIV test because it was part of a medical check-up or procedure [49]. In a survey of 139 patients in New York City who were diagnosed with concurrent HIV and AIDS, or late testers, one-third were Latino [50]. In the year prior to HIV diagnosis, 20% of these respondents reported a provider had offered HIV testing [50]. In Houston, Texas, in a community health center serving a predominantly Latino population, 25.5% ($n=27$) of participants reported they were offered an HIV test at their first medical visit [51].

While these studies show that provider offer of HIV testing is low, patient willingness to accept HIV testing is high when the test is offered. In a community sample of 255 Latino men in South Florida, mostly foreign-born MSM, 85.6% were willing to accept an HIV test based on physician's recommendation [47]. Reasons that clinical sites may not offer an HIV test include provider knowledge of HIV testing recommendations; insufficient time, staffing or space to provide counseling; and provider comfort-level [52].

Health System and Societal-Level Factors

Clinical and non-clinical settings can offer HIV testing but inadequate access to health services in Latinos hampers uptake of HIV testing [53]. Based on a study by the Pew Hispanic Center and the Robert Wood Johnson Foundation, 27% of Latinos do not have access to a usual source of health care [54]. Within Latinos, this finding is more common in immigrants, males, uninsured, those aged 18–29 compared with those aged > 29 years, and those with lower education [54]. The absence of a health provider visit in the past year increased the odds of not having undergone HIV testing [adjusted OR 1.78 (95% CI 1.48–2.14)] in the 2000 National Health Interview Survey [30].

Part of this barrier to health care for Latinos in part relates to health insurance coverage. With passage of the Patient Protection and Affordable Care Act (ACA), the national adult uninsured population decreased from 22.3% in 2010–13.0% in 2015 [55]. When disaggregated by race/

ethnicity, Latinos remain the largest racial/ethnic group uninsured at 17% [56]. Medicaid is a principal source of health insurance coverage for individuals with HIV. Medicaid coverage for routine HIV testing varies by state. Routine HIV testing is considered an optional benefit for adults older than age 21 and further limits access to HIV testing [57].

Geographic variation in HIV testing across the US overlaps with a shift in patterns of migration for Latinos. Labor opportunities in meat packing, construction, and service industries in the Southeast and Midwest regions promote Latino migration to these emerging destinations. These regions overlap with areas of less frequent HIV testing [58]. Geographic variation in HIV testing could be explained by the lag in the expansion of health care services to meet the needs of the escalating number of Latinos moving to cities without established communities [59]. Furthermore, Medicaid expansion varies by state. Most states absorbing this Latino migration have not adopted Medicaid expansion, limiting the availability of HIV testing [60].

In addition to access to routine medical care, other venues such as substance use treatment facilities and correctional facilities can service as an important gateway for HIV testing. Barriers to substance use services for Latinos further impede access to HIV testing [61, 62]. Even if an individual establishes access to substance use services, HIV testing is not uniformly offered at all treatment facilities [63, 64]. Correctional facilities are an important portal for health care for incarcerated Latinos and the large migrant Latino population that traverse US detention facilities. Yet there is substantial variation in HIV testing practices in correctional facilities nationwide [65]. In a nationally representative sample of 14,250 state prisoners and 3,686 federal prisoners, inmates were surveyed about their access to HIV testing [66]. Latinos in the federal prisons had 50% lower odds compared with non-Latino white prisoners for HIV testing during incarceration (AOR 0.48; 95% CI 0.31–0.74). Evidence from a large survey of incarcerated individuals in the North Carolina prison system (48% were black and 52% were white or other), showed that 89.3% of prisoners wanted HIV testing at prison intake [67].

A large proportion of new HIV infections in Latinos are in immigrants, yet guidelines for HIV testing in Immigration and Customs Enforcement (ICE) health care facilities recommend symptom-based rather than routine HIV screening [68]. These guidelines depart from recommendations by the National Commission on Correctional Health Care and the CDC that support routine HIV testing [9, 69].

Criminalization of HIV and fear of deportation serve as important contextual factors relevant to uptake of HIV testing in Latinos. Up until 2010, HIV infection was reason to bar residence in the US; yet HIV infection remains associated with criminal behavior in many US states and reinforces associations between HIV diagnosis and fear of deportation

in immigrants [70, 71]. Federal indecision about the status of undocumented immigrants raises challenges at the state level as to whether it is a good investment to effectively cover these types of preventative services [72].

Linkage to HIV Care

Patient-Level Factors

After a new HIV diagnosis, patients are vulnerable to delay linking to outpatient HIV care and treatment. The Attitudes and Beliefs and the Steps of HIV Care Study examined characteristics of individuals not linked to care in Houston, Texas, where 39% of the sample was Latino [73]. Participants demonstrated high rates of comorbid depression, low self-efficacy, and active substance use. In another study of linkage to HIV care in hard-to-reach populations, 219 HIV-infected Latinos were interviewed regarding their barriers to HIV care [74]. Primary Spanish language speakers were more likely than primary English speaking Latinos and non-Latinos to be concerned about stigma. Spanish speaking Latinos were concerned about disclosure of their HIV serostatus and sexual identity, upsetting their family or partner, and their healthcare provider inquiring about sexual practices and drug use. Furthermore, Spanish speaking Latinos were more likely to reflect fatalistic beliefs and lack of individual agency that diminished the urgency of HIV care. Other studies have corroborated additional psychological and informational barriers to linkage to care in Latinos such as feeling too sick to seek medical services, fear of burdening the family, denial of the importance of HIV, and lack of knowledge about the significance of delayed HIV care [75–77]. Social support was also associated with earlier HIV diagnosis and linkage to care in the Houston-based cohort, though this finding needs to be validated in a larger Latino population [78].

Provider and Clinic-Level

Strengths-based support through case management is an effective clinic-based intervention to link vulnerable patients to HIV care [79]. Subgroup analysis of the Antiretroviral Treatment Access Study (ARTAS) demonstrated that a brief case management intervention focused on strengths-based support was significantly more effective in linking Latinos to HIV care than other ethnic groups [80]. The authors noted that Latinos were recruited from HIV testing facilities that were more often co-located with HIV care services, which may have confounded the outcome of linkage to care.

The Adolescent Medicine Trials Network for HIV/AIDS Interventions clinic sites represents clinics (AMTUs) that care for adolescents, ages 12–24, in 13 cities in the US and Puerto Rico. Data from the AMTUs show that linkage

to care among Latino youth was lower (70.9%) than non-Latino whites (81.3%). For all adolescents, linkage to care was higher in clinics that were “adolescent-only” rather than HIV specialty [77].

These examples of effective linkage to care strategies highlight the importance of clinic characteristics and the health care worker providing linkage to HIV care, particularly where Latino cultural values underscore warmth and respect in interpersonal relations including in clinical encounters [81].

Health System and Societal-Level Factors

In a nationally representative sample of HIV-infected Latinos in the US, absence of a source for routine health care at the time of HIV diagnosis was associated with being male and HIV exposure from IDU and heterosexual sex [82]. Furthermore, HIV-infected female Latinas, compared with male Latinos, were more likely to use the emergency room for routine health care. Based on the adolescent data from the AMTUs, linkage to care was improved when outreach workers received real-time data from the public health authorities to interact directly with HIV-infected youth [77]. Building upon the value of personal contact, interventions that emphasize use of health system navigators, as well as frequent outreach attempts by health program staff, may be key system-level interventions to successfully link HIV-infected Latinos to HIV care, particularly for adolescent Latinos [83–85]. Taken together, these data offer targets within the health care system that could facilitate improved linkage to HIV care for Latinos.

Adherence to ART

Patient-Level Factors

Adherence to ART in Latinos is affected by converging factors at the individual level that relate to socio-demographics (e.g. educational level, gender, age, financial security, homelessness, immigration status), cultural beliefs (e.g. beliefs about HIV, ART, and the role of medicine and religion), and psycho-social states (e.g. perceived stigma, mental health, self-efficacy, and perceived need for ART). In a sample of 81 HIV-infected monolingual Spanish-speaking patients, barriers to adherence were having low ART-related knowledge, low perceived need for ART, delayed refilling of prescriptions, and feeling overwhelmed [86]. HIV-related stigma can lower ART adherence since internalized stigma can lead to difficulties in disclosing HIV status and concealment of the use of HIV medications [87, 88]. *Machismo* was associated with decreased adherence to HIV medications in HIV-infected Latino males in Los Angeles [89]. In this study, *caballerismo*, a construct of masculinity that encompasses

a duty to protect, was associated with increased ART adherence. Further understanding of the relationship between gender roles on ART adherence may be an important lever to promote long-term adherence to ART for treatment as well as HIV prevention in Latinos [89].

Simpler ART regimens, in the modern era of HIV treatment, alone may not obviate treatment interruptions in Latinos. For example, in a sample of 1131 HIV-infected individuals recruited to participate in a survey on ART adherence, depressive symptoms strongly predicted 4-day ART interruptions in the past 3 months for Latinos (OR 1.80, $p < 0.05$) compared with non-Latino whites [90]. Furthermore, food insecurity is associated with ART adherence and certain classes of ART require food to maximize oral bioavailability. Non-adherence to ART was more common in Latino subgroups with higher rates of food insecurity, such as migrant farm workers [91].

Patient activation is the confidence, skill, and knowledge an individual has that supports his/her active role in health and health care [92]. Patient activation has been associated with ART adherence [93]. Latino immigrants have significantly lower patient activation scores than US-born Latinos [94, 95]. Given lower rates of patient activation in Latinos and particularly in Latino immigrants, patient activation is likely an important target for optimizing ART adherence and HIV care engagement in Latino populations [96].

Provider and Clinic-Level Factors

Large cohorts, including the HIV Research Network, have not shown statistically significant differences in ART prescription in Latinos compared with non-Latino whites [97]. However, perceived discrimination from the provider or lack of trust in the provider has been shown to limit ART adherence in Latinos [98, 99]. In the Steps in HIV Care Study, where 38% of the cohort was Latino, trust in the provider was not associated with ART adherence [100]. This finding reflects that trust in the provider can be critical in some, but not all, aspects of HIV care engagement.

Health System and Societal-Level

Insurance coverage is an important prerequisite to ART access. The Women's Interagency HIV Study showed that women having no insurance or private insurance were less likely than Medicaid enrollees to use ART, regardless of race/ethnicity [101]. The unadjusted odds ratio for non-use of ART was higher in Latina women than non-Latina white women. After controlling for insurance status and other population characteristics, the likelihood of ART non-use was no longer present in Latina women. This finding underscores the important role of expanding and improving insurance

coverage to improve disparities in ART access for at least Latina women with HIV.

The AIDS Drug Assistance Program (ADAP) has been a critical source of access to medications and linkage to care for low-income HIV-infected individuals in the US. In 2015, 72% of ADAP recipients had viral suppression [102]. While ADAP eligibility is independent of US residency status under the Affordable Care Act, financial eligibility criteria vary substantially by US state of residence, suggesting that access to medications for low-income HIV infected individuals is not uniform across the country [102, 103]. Furthermore, the fate of ADAP remains uncertain amidst the potential for national health reform.

In the past, ADAPs in many states used cost-containment strategies such as enrollment caps and waitlists. The use of waitlists on ADAPs peaked in September 2011 when 9298 individuals eligible for ADAPs in 11 states were unable to access HIV prescription drugs [104]. Future implementation of such cost-containment strategies could present a serious barrier to ART for low-income Latinos [105].

Retention in Care

Patient-Level Factors

Retention in care requires a series of consistent health-seeking behaviors and is therefore different from linkage to care. Latino males more so than Latina females showed greater non-retention in HIV care in Florida, and there was no difference in retention in US compared with foreign-born Latinos [106]. Qualitative work with HIV-infected Latino immigrants and migrants and their HIV providers identified that HIV related stigma and homophobia in Latino communities were important factors related to retention in HIV primary care [107]. Low English-language proficiency has been associated with higher stigma-related concerns in HIV-infected Latinos [74]. This finding underscores the importance of acculturation on HIV-associated attitudes and beliefs that influence use of HIV care. Additional patient-level factors associated with retention were social support, spirituality/religiosity, and financial insecurity. HIV serostatus disclosure within the social network was another predictor of retention in care in HIV-infected Latino MSM as well as Latina females [108].

Low English language proficiency may also complicate Latino patient navigation of health insurance markets and the insurance application process [109]. HIV-infected Latinos with low English language proficiency have described mistrust of interpreters, either due to concern of confidentiality or lack of fidelity of the interpretation [86]. Qualitative work with Latinos shows that this mistrust in language interpretation erodes patients' confidence in the value of consistent attendance in HIV primary care [107].

Provider and Clinic-Level Factors

Quality of HIV care influences retention in care. For example, trust and rapport between patient and provider in the initial visits can predict downstream HIV-specific health behaviors, such as retention in care [110]. A longitudinal qualitative study of HIV-infected individuals new to HIV care (23% Latinos) reported factors, particularly important early in the HIV diagnosis, that may facilitate retention in HIV care. Those factors were continuity of the provider to avoid repetition of sensitive information and demonstration of provider empathy [110]. In the Steps in HIV Care study, Latino patients exhibited the highest level of trust in physicians, compared with non-Hispanic blacks and whites. Physician trust significantly predicted retention in HIV care [100]. In further qualitative work with Latino migrants and immigrants, a trusting relationship with the HIV provider gave patients a reliable source of clinical reminders for appointments, respected advice on the therapeutic benefit of staying in HIV care, and a source of optimism for the future [107]. All of these factors were crucial during acute life stressors that could jeopardize HIV clinical attendance.

Lack of access to Spanish-speaking HIV providers may diminish the quality of HIV care. For example, monolingual Spanish-speaking Latinos with insurance often do not receive the same level of comprehensive, patient-centered care as do other individuals due to language discordance between patient and provider [94]. A 2011 survey found that health care providers felt that they could not give high-quality HIV care to Latinos as could providers of non-Latino Whites [111]. Reasons for these disparities in treatment included time restrictions, patient's inability to pay, and communication difficulties. A study assessing physician and patient communication in HIV-infected patients found that provider interactions with Latino patients concentrated less on psychosocial content, yet Latino patients rated their encounters as higher quality than non-Latino white patients did [112].

Clinic infrastructure factors influence the availability of HIV care and thus retention in care for Latinos. In a review of best practices in Ryan White HIV facilities, the following strategies were identified as important clinic-level strategies to overcome barriers to retention in HIV care in Latinos: integrated care (e.g. access to mental health and social services on-site); multi-disciplinary HIV clinical teams (e.g. obstetrics, dermatology, primary care, psychiatry) appointment reminders; flexible appointment scheduling (e.g. capacity for walk-ins or urgent visits); expanded clinic hours; consistent monitoring of laboratories, appointment attendance, and ART adherence to preempt disease progression and disengagement from care; discreet clinic name and location of clinic; universal screening for substance use and mental health to reduce stigma [113]. These

organizational characteristics emphasize the importance of welcoming facilities to sustain engagement with Latino HIV-infected patients where affordability, low-English language proficiency, concerns about stigma and privacy, and lack of familiarity with health system are common.

Health System and Societal-Level Factors

As in linkage to care, health systems that use effective outreach workers have higher retention in care as was found in the AMTU cohort [77]. Appropriate data sharing between public health authorities and clinics helps identify and engage out-of-care Latinos with HIV infection. For example, AMTU sites had higher retention in care when public health authorities provided outreach workers with patient-level data so the outreach workers could directly interact with HIV-infected youth.

Nonparticipation in HIV care and poor health consequences are likely when health systems are unwelcoming to undocumented immigrants or socio-political environments lead to concern for deportation in immigrants [114, 115]. For example, threats of deportation discourage Medicaid and Children's Health Insurance Program utilization even by legal immigrants and citizens as has been shown in mixed status families [116, 117].

Viral Suppression

Patient-level virologic suppression is contingent upon adherence to ART. Community viral load, or the sum total of viral load in an HIV-infected population, also determines HIV transmission risk and new HIV infections [118]. At the individual level, managing syndemics [119], or co-occurring disorders such as mental health problems, substance use disorders, and prior trauma may be key to assure engagement across the HIV continuum and virologic suppression [120, 121]. Latino immigrants travel frequently for family and work commitments as well for medical care. This mobility can challenge continuity of HIV care and was associated with interruptions in ART adherence and poorer virologic outcomes in a large cohort of HIV-infected Latinos from the Dominican Republic [122, 123]. Mechanisms to support ART adherence during travel as well as training providers to adopt simpler and more tolerable treatment regimens will likely improve virologic outcomes and the quality of care.

At the health system level, coordination between medical, mental health, substance use treatment and correctional facilities are important predictors of viral suppression across populations and particularly in Latinos who have persistent barriers to these health services [62, 124, 125].

When adjusting for race/ethnicity and other factors, access to private insurance, compared with Medicaid without ADAP and to ADAP for those uninsured, reduced the

risk of unsuppressed viral load in the Women's Interagency HIV Study [126]. Access to insurance and to ART through ADAP not only supports ART access, but also the ultimate clinical and public health goal of virologic suppression.

Implications for the HIV Research Agenda

Multi-level interventions that address barriers to HIV care at the level of the patient, clinic and provider, health system and community-level contexts are most likely to be effective in improving HIV outcomes for Latinos [127]. There are successful examples of community-based HIV prevention and testing interventions in Latino populations from areas of high HIV prevalence both in the US and in resource-limited countries. These efforts include home-based HIV testing, [128–131] training Latino soccer players to serve as lay health advisors to promote sexual risk reduction [132], and HIV testing campaigns situated on internet social meet-up sites frequented by young Latino MSM [133–135].

The quality of the patient-provider encounter remains an area for ongoing innovation to address Latino patients' concerns in HIV counseling and treatment. This means an acknowledgment of the possible mistrust and perceptions of discrimination that Latino patients feel in health care and social settings. Mechanisms to diversify the health care workforce as well as increase access to culturally and linguistically competent care from staff could create a more welcoming environment for Latino patients seeking HIV care. Shared decision-making emphasizes open communication between patients and providers, and is an understudied approach to evaluate the quality of Latino patient decision making around HIV prevention, testing, treatment and care services. Data from cancer treatment show the important role of family in clinical decision-making for Latino patients although this model needs further investigation in its application to clinical decision-making in HIV [136].

At the societal level, stigma around HIV, sexual orientation, and gender identity remains an overarching barrier to HIV service utilization in Latinos in the US [74, 107, 137]. Mechanisms to help HIV-infected Latinos cope with stigma and build resiliency is one strategy as has been described in Latina female commercial sex workers [138]. Durable stigma reduction at the community-level is ultimately key to changing norms around HIV-related behaviors [139, 140].

Immigrants sustain social networks, practices, and relationships that bridge their countries of origin and settlement [141]. Mechanisms to communicate with engage Latinos, regardless of their place of residence, will be important for consistent HIV appointment attendance as individuals move for work and family commitments [142]. Potential interventions include mobile phone-based applications that do not require in-person contact [96]. Binational interventions

between the US and the consulate services (like the *ventanillas de salud* in the Mexican consulates) could improve coordination of HIV care as Latinos migrate across the border for economic opportunities [143]. Latinos struggle with access to ART on both sides of the Mexico-US border, suggesting the need for cross-border efforts to coordinate these health services [144].

HIV-infected Latinos represent a significant proportion of new HIV diagnoses and of those living with the disease. Patient-level, provider and clinic-based, and health system and social context level barriers account for reduced engagement in HIV care in US-based Latinos. These gaps in knowledge require further research and opportunities for intervention. Considering interventions at each of these levels will be critical to supporting improved HIV treatment and care outcomes.

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