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Shifting the HIV training and research paradigm to address disparities in HIV outcomes

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Abstract

Tailored programs to diversify the pool of HIV/AIDS investigators and provide sufficient training and support for minority investigators to compete successfully are uncommon in the US and abroad. This paper encourages a shift in the HIV/AIDS training and research paradigm to effectively train and mentor Latino researchers in the US, Latin America and the Caribbean. We suggest three strategies to accomplish this: 1) coaching senior administrative and academic staff of HIV/AIDS training programs on the needs, values, and experiences unique to Latino investigators; 2) encouraging mentors to be receptive to a different set of research questions and approaches that Latino researchers offer due to their life experiences and perspectives; and 3) creating a virtual infrastructure to share resources and tackle challenges faced by minority researchers. Shifts in the research paradigm to include, retain, and promote Latino HIV/AIDS researchers will benefit the scientific process and the patients and communities who await the promise of HIV/AIDS research.

Keywords

HIV/AIDS; research; mentorship; training; Latino/Hispanic; minority

Introduction

Despite advances in HIV prevention and treatment, substantial disparities exist from HIV diagnosis, to access to and retention in HIV care, antiretroviral (ART) adherence, and virologic suppression [1,2]. While Latinos comprise 17% of the US population, they represent 23% of HIV incidence [3,4]. Latino foreign-born persons bear a disproportionate share of this burden. Among persons who received a diagnosis of HIV in the US from 2007 through 2010, 16% were born outside the US, but among Hispanics, 42% of HIV diagnoses

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were in persons born outside the United States [5]. Compared to non-Hispanic whites, Latinos have a lower proportion of virologic suppression and more frequent progression to AIDS [1,6-8].

To improve the responsiveness of the HIV/AIDS research infrastructure to the needs of minority communities, it is necessary to increase the pool of minority HIV/AIDS researchers as well as change the environment in which researchers train and work [9]. Mounting scientific evidence underscores the importance of having a diverse pool of researchers for the coming decade [10]. There is the business case for diversity, where the representation of different perspectives leads to more thorough critical analyses of issues and consequently better problem-solving [11-13]. The perspective of equity in service provision suggests that building capacity in communities of color, through a diverse physician workforce, sustains the focus on community-defined priorities and raises the responsiveness of the health care system to diverse populations [14-18]. Less attention has been placed on the capacity of minority investigators to transform research because their experiences offer a non-traditional perspective. This diversity of perspective in investigators can lead to new paradigms [19], offer uncommon methods to approach scientific problems [20,21], provide atypical research designs [22], and explore untested hypotheses [23]. While there is greater recognition of the importance of culture, ethnicity, and race on HIV outcomes, increasing the pool of minority investigators in order to address these factors and advance the HIV/AIDS research agenda has lagged [24-26].

The need to diversify the HIV/AIDS research workforce can be seen in the clarion call of Dr. Jonathan Mann, the first director of the first World Health Organization Global Program on AIDS. His early epidemiological work described the social roots of the global HIV/AIDS pandemic [27]. Indeed, Dr. Mann recognized that in order to address the HIV/AIDS pandemic, as well as other pressing public health dilemmas, practitioners needed to move beyond traditional paradigms that attributed disease to individual-level risk factors to also examine social determinants of health. Dr. Mann said, “It is difficult to imagine a more fundamental shift of taxonomy and a more extensive reorienting of necessary actions to protect and promote health” [28]. He noted that how a disease is characterized determines how it is treated.

The development of a diversified research cadre requires more than patching the pipeline in biomedical training; it requires understanding why there has been limited success in recruiting and retaining more racial and ethnic minorities in HIV research, which we will delineate below [10,29]. In this supplement of *AIDS and Behavior*, Richard McGee in his article, “Biomedical Workforce Diversity: The Context for Mentoring to Develop Talents and Foster Success within the ‘Pipeline’”, also addresses mentorship as it relates to the “leaky” pipeline of biomedical training. In this paper, we focus on Latino researchers, although some of the areas covered also apply to other ethnic and racial minority researchers. This paper encourages three main strategies to address the disparities in HIV research training and mentorship in the US, Latin America and the Caribbean (LAC): 1) coaching senior administrative and academic staff on the unique needs, values, and experiences of Latino researchers; 2) encouraging mentors to be receptive to a different set of research questions and approaches that Latino and other minority researchers offer due to

life experiences and perspective; and 3) creating a virtual infrastructure to share resources and tackle challenges faced by minority researchers.

Defining the target population: the case for a global approach in HIV/AIDS research mentorship

There is a shortage of Latino health researchers in the US as well as in Latin America and the Caribbean [30]. In the US, African Americans, Latinos, and Native Americans together represented less than 17% of bachelor's degrees, 15% of master's degrees, and 10% of doctoral degrees in the sciences in 2008 [31,32]. Several institutes of the National Institutes of Health (NIH) have documented a shortage of Latino research fellows in medicine, health, and health services research, partly due to their underrepresentation in graduate and professional schools [33], resulting in a small number of Latinos in full-time faculty positions in health and other sciences [34]. Since minorities are often the ones to pursue research addressing health disparities, this deficit in workforce diversity further stymies the research process [35,36].

In higher education, the institutional environment influences the experience of Latinos and other minorities. Hurtado describes the factors that contribute to the institutional environment, which includes the historical legacy of inclusion/exclusion (e.g. mission statement, policies, rituals and traditions), structural diversity (e.g. composition of Latinos and minorities among students, staff and faculty), psychological climate (e.g. perceptions of and attitudes on discrimination against Latinos), and behavioral factors (e.g. social interactions with peers) [37]. Effective mentorship is a component of creating an academic culture that is inclusive of diversity. As McGee describes in this supplement, Latinos and other minorities experience a lack of access to effective mentorship when there is an unaddressed cultural and experiential chasm between mentee and mentor. This cultural divide can fuel the perception as "outsider" that many Latino researchers report, which affects the training climate and inhibits their full participation in the research community.

Barriers to recruitment and retention of underrepresented minority scientists that are external to individual institutions include the transient nature of federal funding underrepresented minorities in science, technology, engineering, and mathematics (STEM) education. The Health Professions Education Partnership Act of 1998, subsumed under Title VII of the Public Health Service Act, mandates federal funding of initiatives to improve racial, ethnic, and geographic diversity in the health professions. In 2007, over 450,000 students from underrepresented backgrounds participated in Title VII's Health Careers Opportunity Programs (HCOP) and minority Centers of Excellence (COE) [38]. These enrichment programs have supported individuals from disadvantaged backgrounds from kindergarten to post-graduate levels. In the last decade cuts in public funding have jeopardized the success of these programs [39].

Latin American countries face immense obstacles to building capacity for research, including limited governmental funding for research, lack of trained human resources, and unclear research priorities or strategies [30]. Currently, 90% of research and development spending in Latin America is concentrated in Mexico, Chile, Brazil and Argentina [40].

While resources for research are concentrated among a few countries in Latin America, HIV/AIDS remains a challenge across the region, with 1.7 million people living with HIV/AIDS and an estimated 87,000 new infections in 2014 [41]. More HIV/AIDS research is needed to better understand HIV/AIDS in key populations in the LAC region and improve outcomes [42-45]. Frequently cited barriers in Latin America to HIV diagnosis and care are insufficient HIV testing, stigma related to HIV/AIDS and sexual orientation, poor adherence to ART, inadequate patient-provider communication, and financial constraints on patients and health care systems. It is therefore crucial that countries in the LAC region conduct locally-based research and retain and expand the networks of Latino researchers.

The US biomedical research community has much to gain in seeing its research investment targeted in US-based Latino as well as LAC-based researchers. Examples of international HIV/AIDS research networks funded by the National Institutes of Health are the Caribbean, Central, and South America network for HIV Epidemiology (CCASAnet), which is part of the International Epidemiologic Databases to Evaluate AIDS (IeDEA) network, and the Antiretroviral Therapy in Lower Income Countries (ART-LINC) collaboration. These research networks include clinical sites from the LAC region and facilitate research collaborations across diverse settings [46-48]. Strategies for innovation that resource-limited countries employ can teach wealthier countries about novel mechanisms in public health [49]. For example, successful strategies to achieve high rates of ART adherence in resource-limited settings can inform how to improve upon medication adherence in resource-rich settings [50-52]. Multi-national trials on HIV pre-exposure prophylaxis in diverse populations have revealed important understandings around clinical trial design and engagement of study populations [53-55].

Mechanisms to train early-stage investigators for collaborative global health research exist but are few. The Collaborating Centers of Excellence through the National, Heart, Lung, and Blood Institute pairs a research institution in a resource-limited country with at least one research institution in a resource-rich country. This consortium includes a number of LAC-US collaborations for research and training focused on prevention and treatment of heart and lung diseases [56]. Such a model could be translated to include partnerships in HIV/AIDS research. The Global Health Program for Fellows and Scholars program, supported by the Fogarty International Center and 17 NIH institutes, funds early stage investigators based in the US and lower/middle-income countries for mentorship and research in global health [57]. The Puerto Rico Comprehensive Center for the Study of HIV Disparities and Mentoring Institute for HIV and Mental Health is an important model of the creation of multi-institutional collaborations between centers in Puerto Rico and US-mainland institutions [58]. Multi-institutional collaborations and innovation in training and mentorship design offer the best hope for addressing research personnel shortages [59].

Coaching the coaches: New modalities for training research leadership

What sort of program is likely to mentor and nurture Latino researchers in the US and LAC given current limited resources? The spotlight has focused on Latino research fellows, but very little on the senior administrative and academic staff who offer opportunities for career advancement. For HIV/AIDS training programs to respond to the unique needs of Latino

researchers, individuals in research leadership (e.g. training program directors, individual mentors, and senior administrators) require exposure and intimate understanding of the ingredients that lead to successful mentoring and nurturing of Latino researchers in the US and LAC.

Recent work by Gandhi and colleagues, as well as our own experience, suggests that it is critical to coach administrative and academic staff on the frequent obstacles and hurdles that minorities experience [60,61]. Gandhi and Johnson develop this idea further in their article, “Creating more effective mentors”, found in this supplement. In Table 1, we provide strategies to address common obstacles faced by minority researchers based on our own experience of HIV/AIDS training and mentoring. As detailed by Richard Gee in this supplement, core skills in effective communication relate to honesty, an understanding and alignment of expectations and values, and an appreciation of differences between mentor and mentee. Coaching in and practicing these communication skills is key. Attendees in Gandhi and Johnson’s intensive training course for mid-career and senior HIV/AIDS researchers reported increased mentorship ability, improved self-efficacy scores, and ability to address diversity in the mentorship relationship. Coaching can explicitly address issues of race and ethnicity in teaching as well as unfair treatment or institutional policies. Moreover, coaching can address how to eliminate microaggressions that create a hostile educational climate. Microaggressions are commonplace indignities or discriminatory behavior that can corrode individual self-esteem and an academic environment of trust [62,63]. Mentors can also aid mentees in how to manage scientific and institutional responsibilities such as managing committee assignments that can be disproportionately assigned to minority faculty as the “minority representative,” conflict in the academic environment, trade-offs in work-life balance when divergent values exist, and the complexity of promotions when a researcher’s work might be considered non-traditional. Coaching of mentors in how to ensure the success of HIV/AIDS investigators of diverse backgrounds can address how mentees can obtain support for writing, editing, peer review, giving and receiving feedback, and methodological support.

Many aspects that enhance the relationship between administrators or academic staff and Latino and other minority researchers are the same ingredients that help minority patients with HIV/AIDS have better self-care. HIV-infected patients who are more likely to adhere to treatment when they have a good relationship with their provider and feel that they are respected and that their priorities are acknowledged in medical-decision making [64]. Similarly, for good mentoring to take place, the quality of the relationship between the mentees and administrators/academic staff has to be positive, cultivating trust and encouraging open communication. Through coaching, mentors and senior administrators can work to lower mentees’ experience of interracial anxiety and increase institutional trust. Perceived cultural similarity with mentors may be a way of building greater trust, as has been found in studies with black patients with HIV [65].

Augmenting institutional trust by learning about a mentee’s own life experience and hurdles can also be part of the coaching. Mentees from underrepresented groups often report feeling alienated in the academic community, which can hinder use of community resources when personal and academic challenges arise [66]. Coaching mentors to identify these barriers in

Latino and minority researchers and to build skills that increase mentees' self-efficacy can facilitate retention of minority researchers. Assigning leadership roles can enhance Latino researchers' perceived social status in their academic or professional setting, especially when there is a mismatch of race/ethnicity with the majority of personnel. Similar to the experience of HIV-infected minorities, activities that assist in lowering stigma and discrimination of minority researchers will expand Latino researchers' confidence and sense of belonging in the institution [67-69]. Coaching administrators and academic staff on self-reflection and self-examination of personal biases and listening to the experiences and values of minority mentees' in their academic professional setting is the platform for good communication.

Mentoring receptivity to different research approaches

Mentees cultivate research innovation when their life experiences and input transform traditional methodologies and concepts. There are a number of examples relevant to HIV/AIDS research. A mentee who is familiar with the central role that cash remittances may have to enhance family income could have unique input on methodological approaches to analyzing family income in the research setting. Individuals with diverse backgrounds can provide unique insight on the meanings of other socioeconomic variables such as social position, attachment to place, employment, and family and community affiliation that vary based on cultural context [70-72]. For example, conceptions of employment are socially constructed. One person's notion of gainful employment, such as being a cashier or clerk, may be different than a panhandler who also considers him or herself working. A researcher's perspective on migration can provide an important lens into gender roles and social position that vary substantially through the process of acculturation. In HIV/AIDS research, it is essential to explore these factors when evaluating determinants of risk behavior and HIV transmission [73,74].

Mentors serve as important guides to encourage mentees to pursue areas of scientifically relevant and personally meaningful. Careful evaluation of the assumptions that underlie our measurements and instruments are essential in establishing construct validity, the concept that a test or instrument accurately reflects what it was intended to measure [75-77]. Mentors may encounter that their trainees who have prior experience or interest in methodologies with which the mentor is not familiar, whether, for example, photovoice techniques to engage participation of marginalized individuals through photography and story-telling, cost-effectiveness analysis, or ethnography. Multi-disciplinary and inter-professional collaborations augment an individual mentor's expertise and can create the critical research infrastructure for the mentee to receive the training and support needed [26,78]. In this supplement, Magnus and Castel in their article, "Breaking Down the Silos: Developing Effective Multidisciplinary HIV Research Teams," describe the importance of multi-disciplinary research teams in HIV prevention and treatment research. Mentors play an important role in teaching mentees how to seek out expertise and function in multi-disciplinary teams.

In order to identify and address the central scientific questions behind HIV transmission and persistence in individuals and communities, multiple models of inter-professional

collaborations are necessary. In its recent report on the future of HIV/AIDS research, the Office of AIDS Research encouraged the dissolution of “traditional silos--defined by topic focus and by scientific discipline” [79]. Embedding HIV/AIDS research within other public health research is relevant. Examples of this are the evaluation of HIV testing within a behavioral intervention trial to reduce substance use; the determination of HIV/AIDS and substance abuse risk by studying cultural processes in Latino families; or the assessment of a home-based method for screening for diabetes and hypertension by HIV counselors [80,81]. These interdisciplinary approaches to research and nested study designs expand the possibilities for collaboration and “real world” settings in which to develop and evaluate public health interventions.

Creating an infrastructure to address the challenges faced by Latino and other minority researchers

Many minority researchers and institutions do not have the same level of connections or access to methodological expertise as other faculty or mainstream institutions [58]. Minority-serving professional organizations focused on STEM provide a key umbrella of HIV research and training mentorship. The National Hispanic Science Network (NHSN) is an organization founded in 2001. Because many institutions do not have the local expertise to support mentorship of Latino investigators, the NHSN provides a virtual mentorship network. A formal mentorship program links early career investigators with senior faculty who can serve as external mentors. In-person interactions at the national meeting support the mentoring relationship. Interian and Escobar’s R13, through the NHSN platform, provided mentorship to many young investigators interested in research careers and created a pipeline for many who became independent investigators [82]. Supervision came in the form of technical expertise from faculty, support with grant writing, as well as peer mentoring. During the first four years, 53 new investigators participated and the most highly cited strength of the program was the exposure to senior mentors in a supportive environment [82]. In another example of conference-based mentorship, Advancing Chicanos/Hispanics and Native Americans in Science is a national non-profit organization aimed at increasing diversity in STEM fields for students and faculty through a national network of mentors and peers, annual conference organization, and policy advocacy [83].

In addition to building professional support through national organizations, connecting Latino researchers with successful investigators in their areas of interest outside their own institution through a virtual infrastructure of support empowers Latino researchers to have opportunities for success [84]. The Puerto Rico Comprehensive Center for the Study of HIV Disparities and the Mentoring Institute for HIV and Mental Health matches mentees with expertise in collaborating institutions [58]. Creating structured opportunities for training and research experience with senior mentors has also shown positive results in engaging minority students in HIV research [10,85]. For example, an analysis of the Research and Mentoring Program (RAMP) for minority medical students working in the international HIV Vaccine Trials Network showed significant improvements in self-reported knowledge and professional skill-related areas such as scientific writing. Furthermore, there was a significant increase in the proportion of participants who reported an intention to pursue a

career in HIV/AIDS research, and a belief that such opportunities were open to program participants [85]. The Visiting Professors Program at the University of California at San Francisco (UCSF), through the Center for AIDS Prevention Studies, supports faculty focused on HIV prevention research in minority communities [86]. Recipients receive on-site training at their home institution and UCSF, along with seed research funding, assistance with peer review and grant writing, a structured summer training program, and access to methodological expertise. The Building Infrastructure Leading to Diversity (BUILD) initiative through NIH funds colleges and universities to expand research opportunities and promote and retain faculty from diverse backgrounds [87].

The deficit of Latino researchers in the US and LAC countries has a widespread impact on research in health care services in HIV/AIDS. Limited numbers of Latino and minority researchers may result in fewer studies that generate important solutions, and a paucity of researchers who serve as role models. This perpetuates the lack of diversity in the research community and misses out on wide-ranging views of the problem and how to address it. A diverse cadre of HIV/AIDS researchers can also collaborate and synergize with individuals and organizations working in direct service with underserved communities who address inequalities on a daily basis [88,89]. Improving traditional mentorship models to support the success and retention of Latino and other minority HIV/AIDS researchers would provide a necessary ingredient to advance HIV/AIDS research and effectively serve the unmet needs of HIV-infected minority populations.

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Table 1

Strategies for mentors to address common obstacles faced by minority mentees.

Mentor-mentee communication	
•	Commitment to regular and open communication between mentor and mentee. A simple open-ended question of “how are you doing?” indicates that the mentor views the mentee as a whole person (e.g. work, family, social, and physical needs). This style opens the door for discussion of difficult topics (e.g. unfair treatment by peers, colleagues, or students; interpersonal conflict; or illness) if or when they occur.
•	Regular mentor-mentee assessment of goals and expectations to manage unforeseen challenges.
•	Review monthly work chart together.
•	Develop record of publishing together and accomplishing objectives.
Methodological training	
•	Early and regular communication of expectations.
•	Discussion of skills needed to accomplish short and long-term projects. For example: “We have an opportunity to work on a new analysis that requires advanced training in handling missing data. Let’s review the kinds of skills we need to complete the analysis and identify areas that you can do independently and those you will need additional training or support.”
•	Regular assessment of research progress to ascertain need for further training or support to advance analyses.
English language proficiency	
•	Establish writing groups in the lab or research group for peer/mentee editing.
•	Establish infrastructure for internal and external review for proofreading of manuscripts and grants and critique of oral presentations