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Critical Perspectives on Expanding Racial/Ethnic Diversity in the HIV Research Workforce: Comorbidities and Mentoring

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Abstract

HIV-related comorbidities in underrepresented minority populations are reframed to include the co-occurring problems of systemic and structural barriers, within the mentoring context as a buffer and as action-oriented. This framework is discussed to improve racial and ethnic minority diversity in the research workforce from the perspectives of HIV comorbidities and mentoring. An integrated and coordinated approach to HIV-related comorbidities and inequities may be helpful when combined with research on the social-structural contributions as drivers to diversify the research workforce. We emphasize how these key research issues (a) provide a platform for training and retraining a highly motivated, diverse workforce and (b) facilitate the empowerment of these trained individuals to conduct rigorous scientific research on social-structural factors to mitigate the effects of these comorbidities. We conclude that a diverse research workforce is necessary but insufficient for improving training-related outcomes or reducing comorbidity effects. Additional considerations are warranted that include systemic approaches and changes at the structural and institutional levels.

Keywords

HIV; comorbidities; inequities; mentoring; social-structural barriers; underrepresented minority scientists; racial ethnic diversity

A well-trained and racially and ethnically diverse research workforce is an essential component of any plan to address what drives, maintains, and will remediate health inequities. It is generally agreed that a racially and ethnically diverse workforce would significantly impact inequity-related factors and outcomes at the individual, community, and systems levels (e.g., Collins et al., 2021; Stoff & Cargill, 2016; Valantine et al., 2016; Wyatt et al., 2009). Significant challenges have been suggested for this work, indicating a critical need to address the alarmingly low number of historically underrepresented minority (URM)

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scientists (including Black/African American, Hispanic, American Indian/Alaskan Native, Native Hawaiian/Pacific Islander) and to improve the training and experiences of URMs in the scientific workforce (Valantine & Collins, 2015). Effective, tailored training experiences are an imperative to address the disturbing gap in the faculty and leadership ranks within academic and research public health for Hispanics/Latinos (Ramirez-Valles et al., 2022) and Blacks/African Americans (Stevens et al., 2021), the two largest racial and ethnic minority groups in the United States according to the U.S. Census Bureau.

As can be seen from Figure 1, existing data from the National Science Foundation (NSF) and other sources indicate a striking lack of URM scientists in the research workforce relative to their representation in the general U.S. population (science faculty and National Institutes of Health, NIH, R01 grants). Recent data indicate a trend toward reduction of the NIH funding gap, especially for African American/Black people (Lauer & Bernard, 2022). Over the years, the NIH has supported many initiatives and programs to enhance diversity, equity, and inclusion—summarized elsewhere (e.g., Stoff & Cargill, 2016; Valantine et al., 2016). We have learned that these programs are valuable and necessary but far from sufficient to create the widescale systemic changes required for diversity and inclusion across the biomedical enterprise. The NIH Director (Collins et al., 2021) has recently acknowledged the importance of overcoming structural and systemic obstacles to better reflect diversity, equity, and inclusion in funded research and the biomedical workforce. Thus, there is room for improvement by addressing several deeply embedded challenges (Valantine & Collins, 2015).

A workforce lacking in diversity is especially troubling for diseases such as HIV/AIDS that disproportionately affect underrepresented and underserved populations (National HIV/AIDS Strategy, 2022–2025). An example of diversity, equity, and inclusion initiative, sponsored by National Institute of Mental Health (NIMH), employed the research education mechanism (R25) to develop multiple programs that created a pool of URM scientists in HIV (Stoff, 2019). Despite the benefits of these programs on some metrics, enhancing the research workforce by simply increasing the number of URM scientists without altering the broader social-structural and cultural contexts may lead only to continued isolation and marginalization (Stevens et al., 2021). Efforts need to identify systemic solutions that foster the social-structural integration of URM scientists into the institutional culture in various ways, including institutional mission and values leadership development, campus climate, student services, research programs, interactions, networks, and community involvement. We still have a long way to go to reach a truly diverse research workforce.

Most current models of research workforce development have targeted individual-level factors (e.g., mentoring) with much less attention to factors at the systems level (e.g., strengthening resources, promoting coordination, integration, and collaboration of diversity efforts, enhancing institutional commitment, and fostering leadership) (Stoff & Cargill, 2016; Zea & Bowleg, 2016). There has been considerable interest in two aspects influencing racial and ethnic diversification of the workforce: (a) academic and career factors (Layton et al., 2016; Wilbur et al., 2020) and (b) recruitment, retention, and other related strategies (Dawkins, 2021; Vassie et al., 2020) but far less interest in psychosocial systemic factors such as fostering an inclusive climate (Maduakolam et al., 2020) or reducing the impacts of

racism and intersectional discrimination or (Lett et al., 2022) implicit bias (Hall et al., 2015). Furthermore, there has been little interest in research-based mitigating factors (i.e., variables known to impact HIV disease) other than a few reports that social determinants of health are related to the diversification of the health care workforce (C. S. Jackson & Garcia, 2014; LaVeist & Pierre, 2014). Here, we address the diversification of the research workforce: (a) from the perspective of HIV-related comorbidities and link these comorbidities to social-structural barriers that also impact upon HIV (see I below) and (b) discuss how mentoring strengthens the research workforce by reducing the negative impact of these factors that influence the HIV disease process (see II below).

(I) Research Workforce Diversity: HIV Comorbidities.

To the best of our knowledge, this is the first discussion of the role of comorbidities as a mitigating factor in developing and implementing a racially and ethnically diverse research workforce. Since the focus of clinical research has shifted from AIDS-defining to non-AIDS-defining illnesses, we favor the definition of comorbidities as the existence of a chronic condition developed during HIV infection, related or unrelated to HIV pathogenesis, which can affect the clinical course, treatment, prognosis, or quality of life of the patient (Martínez-Sanz et al., 2022). We expand on this comorbidity definition to also include the condition under which people affected by HIV are placed at increased adverse HIV outcomes.

We focused on comorbidities because it is a top research priority in preclinical and clinical HIV research, according to the NIH Office on AIDS Research (Pahwa et al., 2021). In addition, because racial and ethnic minority communities are disproportionately affected by comorbidities (Cook et al., 2018; Rawlings & Masters, 2008; Shadmi, 2013), URM scientists are more likely to experience adverse living and work conditions (e.g., discriminatory) and be attuned to the impact of comorbidities. As such, URM scientists are more aware of the social-structural barriers (e.g., structural racism, lack of access to health care, poverty, and incarceration) that constrain opportunities for many racial and ethnic minority communities to engage in preventive or health-promoting behaviors (Carroll et al., 2022; Njoku et al., 2021; Page, 2007). This same culturally and community-grounded knowledge and incorporation of their own lived experiences can also benefit the types of preventive messages, programs, and research that scientists from racial and ethnic minority communities are likely to develop.

Comorbidities such as diabetes, Hepatitis C, and cardiovascular diseases have been amply documented to be more common among URM groups with HIV compared to White counterparts (Lim et al., 2018; Pahwa et al., 2021). The prevalence of comorbidities increases with age (Shiau et al., 2020); African Americans show the highest prevalence of multiple comorbidities (Palella et al., 2019). While the mechanism for the high comorbidity burden is poorly understood (Pahwa et al., 2021), intersectional stigma (Berger, 2004; Rich et al., 2020), network characteristics (Choi et al., 2017), or other psychosocial problems may mediate this effect. These socio-structural factors among URM scientists act as systemic barriers occur against a background of multiple interacting behavioral, social, cultural, environmental, and ecological factors (Singer et al., 2017) that not only obstruct access to

vital health care services but also impede diversification of the research workforce (Hoppe et al., 2019; Rhodes et al., 2021; Zambrana, 2018), contributing to the disproportionate burden of HIV/AIDS (Glynn et al., 2019). Moreover, interventions are needed to address critical social and structural determinants of health inequities (Sutton et al., 2021).

Social-structural barriers are addressed because of their primacy and salience in inequities (Ma et al., 2021; Thomas, 2014; Ulloa et al., 2018). Comorbidities share some similarities with these social-structural barriers (i.e., both are co-occurring problems that lead to adverse health outcomes). However, they are inherently different (the former represents diseases or conditions, while the latter refers to systemic psychosocial obstacles). In addition, others have reported similarities or the synergistic impact of combined comorbidities and social-structural barriers, suggesting common mechanisms for intervention targets. For instance, not only were structural barriers to care associated with higher cardiovascular comorbidity burden in Mexican Americans (de Heer et al., 2013), but also the combination of structural factors and comorbidities were the best predictors of COVID-19 lethality and severity (Bollo-Chavoll et al., 2021). The origin of racial and ethnic inequities in COVID-19 appears to lie in systemic structural disadvantage, which likely drives the development of comorbidities (Carethers, 2021).

Understanding and addressing HIV-related comorbidities can strengthen a more diverse research workforce. It will be necessary to expand our integrated understanding of health inequities in racial and ethnic minority communities and to advocate for, develop, implement, and evaluate structural competency approaches likely to have a greater impact at the population level (Metzl & Hansen, 2014). Furthermore, enhancing the research workforce by simply increasing the number of URM researchers without altering the broader social-structural and cultural contexts may lead only to continued isolation and marginalization (Stevens et al., 2021). Efforts need to identify systemic solutions that foster social-structural integration into the institutional culture in a variety of ways, including institutional mission and values leadership development, campus climate, student services, research programs, interactions, and networks and community involvement. More attention is needed on the important role of cultural and structural competence (e.g., issues like racism; power; and White, male, cisgender, heterosexual, class, and able-body privilege) in mentoring relationships (Brown & Montoya, 2020), as a component of competency-based mentorship to target pipeline progress (Kaslow et al., 2018).

Structural racism and interlocking systems of oppression (e.g., herosexism, sexism, and economic exploitation) are the root cause of HIV comorbidities and health inequities experienced by racial and ethnic minority communities, not only at the population level, but also in the workplace, including among URM HIV scientists (Dent et al., 2021; Diaz et al., 2020; Misra et al., 2021; Titanji & Swartz, 2021; Thorp, 2020). Structural racism has been proposed as a core social-structural determinant of health (Yearby, 2020), and it may similarly play a significant role in the structural barriers associated with adverse outcomes from comorbidities. We need an integrated and coordinated systematics approach to increasing racial and ethnic diversity (e.g., Valantine et al., 2016) with particular attention to comorbidities, together with socio-structural barriers that are a byproduct of the systemic racism restricting opportunities for URM scientists and creating ongoing stress (Jones,

2000). Furthermore, we recognize that the negative impact of comorbidities on the quality of life of people with HIV is far beyond that of the infection itself. The presence of comorbidities complicates the clinical evaluation requiring input from different specialists outside the HIV field (Martínez-Sanz et al. 2022). Since comorbidities are indifferent to medical specializations, an integrative and patient-centered multi-system disease approach has become an imperative for other chronic diseases or health inequities complicated by comorbidities.

(II) Research Workforce Diversity: Mentoring and HIV Inequities.

While effective mentoring has been well-documented to support career development and advancement in emerging researchers and in URMs (Burgess et al., 2018; Gutiérrez et al., 2021; Ransdell et al., 2021), we advocate here for the lesser-known benefits of mentoring to buffer mentees from stressful, negative, and detrimental experiences (South-Paul et al., 2021). Even different forms of mentoring delivery (e.g., peer, dyad) have protective and buffering effects against diverse adverse experiences such as microaggressions (Nair & Good, 2021), racial discrimination (Sánchez et al., 2017), and employee burnout (Varghese et al., 2020). It is thought that these buffering effects are based on the notion that mentoring relationships provide “holding behavior,” creating a safer empathic environment (Kahn, 2001). In much the same way, we propose that effective mentoring may buffer against the impacts comorbidities, and social-structural barriers (e.g., racism, sexism, and discrimination) such that the impact of these negative experiences is reduced so as not to derail the careers of mentees. Furthermore, critical theoretical frameworks grounded in social justice, such as intersectionality (Bowleg, 2012) and critical race theory (Ford & Airhihenbuwa, 2010) can provide powerful tools to advance academic and health equity. Intersectionality with its focus on multiple interacting structures of oppression (e.g., racism and sexism) can lead to a more exacting analysis of health and mentoring inequities which in turn can facilitate REM diversity. Both frameworks emphasize the need to center the experiences and needs of historically marginalized groups and dismantle structural racism and intersectional discrimination associated with comorbidities and unequal mentoring relationships.

In addition to the role of mentoring as a buffer, we believe that for people at multiple marginalized intersectional identities, mentoring should go beyond navigating through institutions to changing and transforming institutions and disciplines (Brown & Montoya, 2020). Mentoring must do more than focus exclusively on changing the behavior of marginalized groups to navigate and survive an unjust system replete with structural barriers. Power and privilege in the mentoring context should not be overlooked. Mentors should use their privilege to disrupt the privilege that benefits them in the first place. Mentors are encouraged to explore all areas of privilege to decrease the likelihood of discrimination or damage from microaggressions. In fact, when mentors engage in dialogues with mentees from URM communities and thereby encourage explicit conversations about discrimination, providing an opportunity to cultivate a sense of openness to change (Kim & del Prado, 2019), the negative impact of differentials in power and privilege on the mentoring of training experiences can be reduced (Madore & Byrd, 2022). Engaging in these difficult

dialogues can give the mentor a greater appreciation of the negative impacts moving their cultural competence from awareness to action toward equity.

All mentors should use the most effective ways to identify, discuss, and deal with implicit bias (i.e., attitudes or stereotypes that affect our understanding, judgment, actions, and decisions). Training in implicit bias can help researchers to become self-reflective and recognize their own biases in the conduct of scientific research (Carnes et al., 2015). Although much work is needed to understand the ways to effectively address implicit bias through educational or training programs, researchers, and clinicians need to practice self-awareness on racial bias and stigma (Hagiwara et al., 2020). It is urgent that mentors who occupy more privileged intersectional positions (e.g., White, cisgender male, and heterosexual) reflect on and seek training to address their own biases as they may pose barriers to successful mentoring with diverse mentees. Mentor and mentee selection must be examined from an antiracism lens to ensure an equitable process for assignments of experienced mentors to new URM investigators by affording mentors robust training programs when working with diverse mentees (Norman et al., 2021). In addition to their subject–matter expertise, these diverse mentors often bring experience grounded in their lived experience and commitments to racial and ethnic minority communities. Within the infrastructure of the National Research Mentoring Network, structurally aware mentorship training enhances mentors' ability to address cultural diversity matters in their mentoring relationships effectively (Byars-Winston et al., 2018). Such mentorship training can achieve the goal whereby research mentors can engage in frank discussions with mentees from diverse backgrounds about implicit bias, privilege, and discrimination, in the context of research training on inequities, comorbidities, or other topics.

Although such trainings are important, they may be insufficient to provide a deeper understanding of the impact of institutional and structural racism (Yudell et al., 2020) and, more importantly, how to overcome structural constraints that may occur in the social interactions during research mentoring relationships (e.g., issues of power, privilege, identity, and social justice). All mentors should have skills to navigate the dynamics inherent in these relationships with mentees from URM groups (e.g., feelings of being unvalued, incompetent, isolated, and marginalized) (Alegría et al., 2009; Hurtado, 2002). This can lay the foundation for addressing other sociocultural factors impeding communication and research (e.g., microaggressions or stereotype threat) and can facilitate the development of a scientific culture in trainees (i.e., science identity and self-efficacy) to openly and effectively address social-structural barriers, enhance diversity, equity, and inclusion, and facilitate the development of a research climate that is inclusive, affirming, and responsive to the social and structural realities of trainees from URMs. Mentors support their mentees to successfully respond to structural and interpersonal racism, develop awareness and skills for dealing with the reality of race or ethnicity-related biases, and, at the same time, navigate the challenges of representing minoritized identities while developing active research careers.

During mentoring, we often encourage mentees to "think outside the box," yet creativity is constrained when standard research methods are frequently applied to underrepresented and understudied populations. Framing the more systemic and structural sociocultural factors (e.g., implicit bias, structural racism and its influences on racial bias in the NIH review

process, being first-generation college students, and high teaching loads in HBCUs) within theoretical perspectives of race and ethnicity may help to develop a deeper understanding of how we need to address structural racism by advocating for more supportive research and academic settings in which URM mentees are not burdened with additional service because they are chosen to represent diversity in academic settings without providing release time for the extra efforts (Zea & Bowleg, 2016). Additional individual-level support may offer mentees invaluable opportunities to develop the critical and structural competencies needed to design and conduct research that is responsive to the experiences and needs of URMs.

Mentoring to develop methodological research skills is an important strategy for facilitating success of new research investigators (Ransdell et al., 2021). We need to better tailor assessment measures and paradigms employed to the needs of marginalized populations. There is often a dearth of culturally congruent measures available for mentees who conduct research with communities marginalized by structural inequality (Alegría, 2009). For example, photovoice techniques, wherein community members use photography, story-telling, and group discussion to identify and share their needs, assets, and priorities and translate findings into positive action, is a powerful empowerment process for building a rich understanding of participants' lives and factors that influence their health and well-being. Photovoice may provide insight into the everyday reality of their experience of living as it has been shown to be sensitive to social-structural themes of discrimination, rejection, and lack of mental health services in Black men with HIV infection (Sun et al., 2019). There is also now current interest in methodological innovations improving our ability to operationalize intersectional stigma within the field of HIV (Earnshaw et al., 2022). Exploration of diverse research paradigms of both quantitative and qualitative approaches will require expansion of current funding programs and the creation of new mechanisms to support the development and use of culturally congruent research methods for examining URM populations and for being more responsive to the perspectives and experiences of mentees (Levison & Alegría, 2016).

In contemporary HIV research, team science, or the co-mentoring model has been preferred and the attributes for successful HIV research teams have been discussed elsewhere (Polanco et al., 2011). We rely on teams that bring together different backgrounds, skill sets, perspectives, and life experiences. The greater diversity we bring to our teams, the richer our potential is for innovation. There is evidence that diverse teams publish more and are more highly cited (AlShebli et al., 2018). However, few have received training or guidance on how to synthesize disciplinary knowledge and methods into an interdisciplinary approach (Matthews-Juarez, 2013). The interdisciplinary nature of health equity and comorbidity research requires an interdisciplinary mentoring model that considers diversity in a number of ways (racially and ethnically on teams, methodological approaches, critical and structural perspectives) to be an asset. Diversity cuts across organizational silos fosters an integrated approach across multiple disciplines and requires strong collaborations between researchers and community organizations, service providers, and systems (Nash, 2008). Interdisciplinary teamwork combining knowledge from different fields holds out the hope of downstream and upstream approaches simultaneously. It has become increasingly important that we work together with individuals who have firsthand life experiences to understand the root causes of these structural problems and develop multifaceted solutions.

Concluding Comment.

We encouraged (a) analysis of HIV-related comorbidities, in combination with social-structural barriers, as a research-based mitigating factor in the diversification of the research workforce and (b) mentoring as a buffer for the negative effects of comorbidities, social-structural barriers, and as action-oriented with expanded supportive networks and more inclusive, equitable resources, and opportunities. A diverse research workforce, which is solely representative at the investigator level, cannot alone solve the problem of racial and ethnic inequities. An integrated, coordinated approach to diversity has been provided by others at systemic, structural, and institutional levels (Bowleg, 2021; Stevens et al., 2021; Valantine, 2020).

A focus on expanding the number of qualified URM investigators may be an important metric but is insufficient to solve the lack of diversity in HIV research. We need to integrate multiple factors that influence HIV outcomes (i.e., comorbidities) in the development of a sustainable diverse HIV research workforce. This will in turn improve HIV outcomes (e.g., less infections and more people with undetectable HIV), quality of care, and aimed at comorbidities or HIV-related health inequities, so that adverse effects may be further lessened. A diverse HIV research workforce must be viewed as one essential component of a more comprehensive set of approaches. Given the critical shortage of HIV providers (Gatty, 2016), attention must also be given to the capacity building of a robust culturally appropriate provider workforce to foster integrated HIV patient-centered care.

There are at least four reasons why additional considerations are warranted in fostering workforce diversity. First, multilevel approaches, such as social, environmental, and cultural factors need to be considered to diversify research, in addition to the inclusion of race and ethnicity. For example, by expanding the HIV research workforce to understand language barriers, cultural practices, and socio-economic inequities, we will be better positioned to address comorbidities and the role of inequities on comorbidities. Intersectional (Bowleg, 2012) and social-cognitive (Byars-Winston et al., 2011) perspectives provide a multilevel framework for the examination of structural-level barriers and factors that greatly influence individuals' access to resources, opportunities, and mentorship. Second, we need to shift from a linear pipeline-based to a systems-based approach with a series of opportunities and choices with transition points along the career path (McGee, 2016). The systems approach promotes successful transitions along the entire career development pathway (including doctoral education, postdoctoral training, faculty appointments, grant making, and promotion and tenure criteria), thereby viewing diversification of the research workforce as a dynamic system toward completion of training and entry into the workforce (Gibbs & Marsteller, 2016; Valantine et al., 2016). Third, we encourage further understanding and intervention development of psychosocial factors (such as culture, stereotype threat, implicit bias, power, and privilege) driven by the economic and political structures that create and sustain inequities and give rise to their presence (Castillo et al., 2020). These psychosocial factors may have a significant impact on the choices that mentees make along their career path informing why people join, stay, or leave science (e.g., Hurtado et al., 2017). Fourth, institutional-level initiatives are needed (e.g., Valantine, 2020), within the context of a mission statement that emphasizes a commitment to diversity, builds a

culture of trust, teaches cultural humility, and fosters a culture of inclusion (C. L. Jackson, 2020). This might include opportunities such as scholarship programs or strengthening diversity-related considerations in the faculty promotional process or other activities that provides for a warmer mentoring climate and support a culturally engaging and inclusive research environment. Approaches and initiatives such as these will not solve the problem of underrepresentation in science, but they will begin to dismantle our biases and barriers that limit progress.

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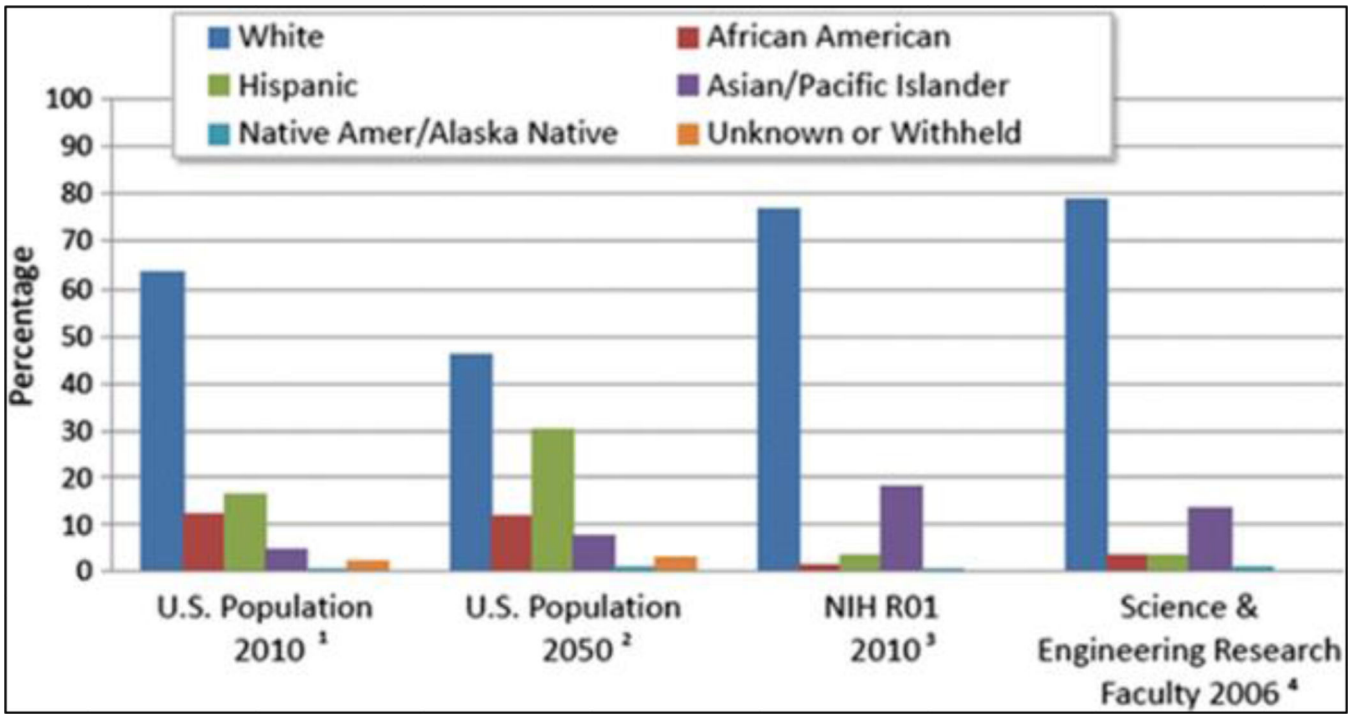

Figure 1.

U.S. Demographics and the Biomedical Scientist Population.

Source. U.S. Census Bureau, National Science Foundation (NSF).

Note. Underrepresented minorities have shown the greatest gains in U.S. population growth (current and projected), yet only about 8% of the nation's scientific research faculty are underrepresented scientists (4% Black/African American, 4% Hispanic, 0.2% Native American/Alaska Native 0.1% Hawaiian–Pacific Islander), while 78% are White; less than 3% of National Institutes of Health (NIH) RO1 grant recipients are underrepresented scientists while almost 80% are White.