The Rationale for Diversity in the Health Professions: A Review of the Evidence

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EXECUTIVE SUMMARY

Several racial and ethnic minority groups and people from socioeconomically disadvantaged backgrounds are significantly underrepresented among health professionals in the United States. Underrepresented minority (URM) groups have traditionally included African-Americans, Mexican Americans, Native Americans, and mainland Puerto Ricans. Numerous public and private programs aim to remedy this underrepresentation by promoting the preparedness and resources available to minority and socioeconomically disadvantaged health professions candidates, and the admissions and retention of these candidates in the health professions pipeline and workforce. In recent years, however, competing demands for resources, along with shifting public opinion about policies aimed to assist members of specific racial and ethnic groups, have threatened the base of support for "diversity programs." Continued support for these programs will increasingly rely on evidence that they provide a measurable public benefit.

The most compelling argument for a more diverse health professions workforce is that it will lead to improvements in public health. We therefore examined the evidence addressing the contention that health professions diversity will lead to improved population health outcomes. Specifically, we searched for, reviewed, and synthesized publicly available studies addressing four separate hypotheses:

1) The service patterns hypothesis: that health professionals from racial and ethnic minority and socioeconomically disadvantaged backgrounds are more likely than others to serve racial and ethnic minority and socioeconomically disadvantaged populations, thereby improving access to care for vulnerable populations and in turn, improving health outcomes;

2) The concordance hypothesis: that increasing the number of racial and ethnic minority health professionals—by providing greater opportunity for minority patients to see a practitioner from their own racial or ethnic group or, for patients with limited English proficiency, to see a practitioner who speaks their primary language—will improve the quality of communication, comfort level, trust, partnership, and decision making in patient-practitioner relationships, thereby increasing use of appropriate health care and adherence to effective programs, ultimately resulting in improved health outcomes;

3) The trust in health care hypothesis: that greater diversity in the health care workforce will increase trust in the health care delivery system among minority and socioeconomically disadvantaged populations, and will thereby increase their propensity to use health services that lead to improved health outcomes; and

4) The professional advocacy hypothesis: that health professionals from racial and ethnic minority and socioeconomically disadvantaged backgrounds will be more likely than others to provide leadership and advocacy for policies and programs aimed at improving health care for vulnerable populations, thereby increasing health care access and quality, and ultimately health outcomes for those populations.

We reviewed a total of 55 studies:17 for service patterns, 36 for concordance, and 2 for trust in health care. We were not able to identify any empirical studies addressing the hypothesis that greater health professions diversity results in greater advocacy or implementation of programs

and policies targeting health care for minority and other disadvantaged populations. Our review generated the following findings:

- URM health professionals, particularly physicians, disproportionately serve minority and other medically underserved populations;

- minority patients tend to receive better interpersonal care from practitioners of their own race or ethnicity, particularly in primary care and mental health settings;

- non-English speaking patients experience better interpersonal care, greater medical comprehension, and greater likelihood of keeping follow-up appointments when they see a language-concordant practitioner, particularly in mental health care; and

- insufficient evidence exists as to whether greater health professions diversity leads to greater trust in health care or greater advocacy for disadvantaged populations.

These findings indicate that greater health professions diversity will likely lead to improved public health by increasing access to care for underserved populations, and by increasing opportunities for minority patients to see practitioners with whom they share a common race, ethnicity or language. Race, ethnicity, and language concordance, which is associated with better patient-practitioner relationships and communication, may increase patients' likelihood of receiving and accepting appropriate medical care.

Several areas warrant further research. Most studies of health professional service patterns are limited to physicians. Studies are needed to determine whether the service patterns of non-physician professionals who serve as many patients' usual source of health care (e.g., nurse practitioners, physician assistants) vary according to race, ethnicity, or socioeconomic background. Studies of racial and ethnic concordance are primarily limited to physicians and mental health practitioners. Future studies should examine the impact of concordance between patients and other health professionals, particularly nurses, who interact closely with patients. Studies have not adequately examined the relative contributions of language concordance vs. combined language and ethnic concordance, an issue that has significant implications for which policy solutions will most enhance quality of care for patients with limited English proficiency. Researchers should thus compare the quality of care in encounters and relationships in at least three categories: concordant language/ethnicity, concordant language/discordant ethnicity, and discordant language/ethnicity.

Studies of the effect of institutional diversity on patients' trust in health care and propensity to use health care services are lacking. Research in this area could start by measuring trust, perceived access, satisfaction, and likelihood of using services among patients receiving care at institutions with differing levels of staff diversity. Finally, research is needed to test the proposed hypothesis that a greater presence of health professionals from minority and socioeconomically disadvantaged backgrounds will lead to greater advocacy, and ultimately better access and quality of care, for disadvantaged populations.

In summary, we found that current evidence supports the notion that greater workforce diversity may lead to improved public health, primarily through greater access to care for underserved populations and better interactions between patients and health professionals. We also identified several gaps in the evidence and proposed an agenda for future research that would help to fill those gaps.

Conducting this research will be essential to solidifying the evidence base underlying programs and policies to increase diversity among health professionals in the United States.

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INTRODUCTION

Achieving a health care workforce that reflects the diversity of the U.S. population is an explicit goal supported by, among others, the Association of American Medical Colleges (AAMC),[1] the American Medical Association (AMA),[2] and the Institute of Medicine.[3, 4] Expanding the workforce of underrepresented minority (URM) physicians has warranted significant attention. URMs have traditionally included African-Americans, Mexican Americans, Native Americans, and mainland Puerto Ricans. Since 2003, the AAMC has defined "underrepresented" as those racial and ethnic populations that are underrepresented in the medical profession relative to their numbers in the general population.[5] Several racial and ethnic groups, most notably African-Americans, Latinos, and American Indians continue to be significantly underrepresented in the health professions workforce when compared to their representation in the general U.S. population (Table 1).[6]

Several national programs have sought to expand the URM health care workforce. The AAMC sponsored "Project 3000 by 2000" in the 1990s, which aimed to expand the number of URM medical students to a total of 3000 by Year 2000. While the program did not achieve this goal, it did spawn two other programs still administered by the AAMC that aim to expand diversity. The first, the Health Professions Partnership Initiative (supported by the Kellogg Foundation and the Robert Wood Johnson Foundation), involves collaborative relationships between academic medical centers and schools with large minority student populations at the kindergarten through college level. The aim of this program is to provide academic support and to expose these students to the range of professional opportunities in health care. The second program is the Minority Medical Education Program (also sponsored by the Robert Wood Johnson Foundation). This is an intensive 6-week program targeted at minorities who are interested in becoming physicians to be better prepared academically for the rigors of medical school.

The Federal Government also sponsors programs to enhance health care workforce diversity, including the Health Careers Opportunity Program (HCOP), Centers of Excellence (COE), and Minority Faculty Fellowship Programs (MFFP), each administered through the Health Resources and Services Administration's Bureau of Health Professions (BHPr). The HCOP provides grants to programs with the goal of enhancing diversity across a wide range of health care fields. Programs recruit individuals from disadvantaged backgrounds (including, but not restricted to, racial/ethnic minority groups) and provide them with preparatory training, counseling, mentoring, and exposure to community-based primary health care. COE grants to health professional schools support a range of efforts related to recruiting and training minorities, including faculty development, a focus on minority health issues, improvements in academic and clinical training opportunities, and stipends to minority students served by these programs. In addition to COEs for minorities in general, there are also Hispanic COEs and Native American COEs. Finally, MFFP grants are awarded to institutions in an effort to increase the number of minority faculty. Salary support and training to foster skills that maximize the chances of academic success are provided to faculty fellows. In turn, the fellows provide clinical services in underserved communities, and engage in academic pursuits. In addition to these programs with national scope, there are many ongoing local efforts with similar aims.

Despite a paucity of high quality research on the effectiveness of these diversity-related programs, available data suggest that they are successful in enhancing diversity in health professions schools.[7] Nonetheless, there are significant challenges to achieving this goal, and trend data reveal that progress towards greater diversity in most of the health professions is slow (Figure 1). Furthermore, the current political climate has placed diversity programs at risk. The increasing number of lawsuits

and ballot initiatives in recent years challenging or rescinding affirmative action policies, sometimes successfully, provides evidence that the general public may no longer be willing to accept at face value policies and programs intended to increase diversity in higher education or in the professional workforce. As such, diversity programs are under increasing pressure to demonstrate their value.

The purpose of this report is to review the evidence base related to the rationale for diversity in the health professions.* The strongest such rationale is that a more diverse health care workforce will lead to improvements in public health. We therefore examined the evidence addressing the contention that health professions diversity will lead to improved population health outcomes. Due to widespread disparities in measures of health and health care for racial and ethnic minority and low socioeconomic status populations,[8, 9] it is critical to understand the state of the science supporting the notion that the health of the population is enhanced, either directly or indirectly, when the health professions more accurately reflect the racial, ethnic, and socioeconomic diversity of the population.

Conceptual Framework

There are no studies that definitively address the association between health professions diversity and health outcomes. Specifically, we know of no randomized controlled trials in which patients or communities have been assigned to receive care from a diverse vs. non-diverse group of health professionals and are then followed for clinical outcomes. In the absence of such direct evidence, examining the association between health professions diversity and health outcomes requires analyzing the links in a "chain of logic" connecting workforce diversity to improved health outcomes.

Before searching for evidence, therefore, we developed a conceptual model of how diversity might lead to improved health outcomes (Figure 2). We derived this model from existing frameworks outlining the rationale for health professions diversity,[3, 4, 10-14] and through discussion with experts in the field. It is important to note that some arguments around diversity focus on the effects of a diverse student body on the quality of health professions education. Our framework does not include this potential effect of student body diversity on education but rather focuses on the effects of workforce diversity on public health. We posit four separate pathways through which diversity in the health care workforce might affect health outcomes:

- Service patterns. Greater diversity among health professionals may lead to greater diversity in the geographic locations where health professionals practice and in the populations they serve. Specifically, health professionals from racial and ethnic minority and socioeconomically disadvantaged backgrounds may be more likely than others to serve racial and ethnic minority and socioeconomically disadvantaged populations, who represent a disproportionately large segment of the Nation's medically underserved. If this were the case, greater health professions diversity would increase access to health care services for underserved populations, which would in turn lead to improved health outcomes.[15-17]

* Our review was commissioned by BHPr, whose diversity programs target individuals from URM groups and socioeconomically disadvantaged backgrounds. As such, we conceptualize diversity from this perspective. It should be noted that other underserved populations are also underrepresented in the health care workforce (e.g. rural populations), and investigation into the role of enhanced diversity in these areas is also warranted.

- Racial, ethnic, and language concordance. Increasing the number of racial and ethnic minority health professionals would provide greater opportunity for minority patients to see a practitioner from their own racial or ethnic group, or for patients with limited English proficiency, to see a practitioner who speaks their primary language. Racial, ethnic, and language concordance may improve the quality of communication, comfort level, or trust in patient-practitioner relationships and thereby improve partnership and decision making. This may in turn increase adherence to effective programs or regimens, ultimately resulting in improved health outcomes.

- Trust in the health care delivery system. Greater diversity in the health care workforce might increase trust in the health care delivery system. Racial and ethnic minority patients, in particular, may distrust health systems and institutions that are managed and staffed by predominantly White health professionals, due to historical segregation and discrimination. If this were the case, increasing diversity might increase minority populations' trust, and in turn, their propensity to use services at those systems and institutions. This hypothesis is similar to the concordance hypothesis articulated above, though at a system or institutional rather than interpersonal level.

- Professional advocacy. Greater diversity among health professionals may broaden the priorities of the health care delivery system. Specifically, health professionals from racial and ethnic minority and socioeconomically disadvantaged backgrounds may be more likely than others to advocate for and implement policies and programs to improve health care for disadvantaged populations. These programs and policies might expand access to health services or improve quality in the delivery of those services. They may also result in greater emphasis and resources devoted to research, advocacy, or service in areas relevant to minority and other disadvantaged populations. Increased access, quality, and attention to issues relevant to minority and other disadvantaged populations would be expected to improve health outcomes for those populations.

METHODS

Evidence Search. We developed strategies to search the existing literature addressing each of the four lines of evidence discussed above: service patterns, concordance, trust in health care, and professional advocacy. We searched the MEDLINE, HealthSTAR, and CINAHL databases using search terms available in each database. For the concordance hypothesis, we also searched the PsycINFO database, because we knew that many of the studies related to patient-practitioner concordance were conducted in the context of mental health counseling and published in journals not included in the other three databases. We supplemented these database searches in four ways. First, we conducted a "gray" literature search, for studies that may not have been published as journal articles but rather as monographs or book chapters. Second, we manually searched the reference lists of included studies and relevant review articles. Third, we searched selected Web sites for relevant references. Finally, we presented our initial results to several audiences including experts in health professions diversity and solicited their input on relevant evidence not yet included in our review. We retrieved articles or documents identified by these supplementary approaches and reviewed them for relevance.

We reviewed titles and abstracts from our database searches and retrieved full articles for those that met inclusion criteria specific to each of our four lines of evidence. When it was not possible to determine from the title or abstract whether an article should be included, we reviewed the full article. We limited our review to articles that included original, empirical data generated within the United States. We believe that, due to the highly variable social significance and meaning of race, ethnicity, and social class, data from other countries would not be sufficiently generalizable to the U.S. In the same vein, we limited our review to studies published in or after 1985, since the social significance and meaning of race in particular has changed, and continues to change, over time. Studies published before 1985 often included data from a period when minority representation in the health professions was substantially lower and when racial attitudes were closer to those of the pre-Civil Rights era than they are today.

Evidence Abstraction and Synthesis. We reviewed all retrieved articles and included those that met our inclusion criteria. We critically reviewed the included articles and abstracted relevant information about the health professional groups and patient populations examined, the principal results of the study, and important study features or limitations. For lines of evidence with more than a small number of studies available (service patterns and concordance), we tabulated the abstracted information in evidence tables, to facilitate comparison, discussion, and qualitative synthesis of the evidence (Appendices A, B, C). For minority professional service patterns and racial, ethnic, and language concordance, we also created tables in which we compared the number of studies that supported each hypothesis with the number that either did not support or refuted the hypothesis. We stratified these tables by race/ethnicity. For example, we counted the number of studies that supported the hypothesis that patient-practitioner race concordance improves quality of care for African-Americans, as well as the number that did not support this hypothesis or refuted it. The purpose of these tables was to provide perspective on the balance of the evidence for each hypothesis. In creating these tables, we found that some studies assessed multiple outcomes related to a single hypothesis (e.g., self-reported delay in seeking care and emergency department visits as measures of access or utilization). When studies like this found evidence supporting the hypothesis in question for one outcome measure, we counted the study as supporting the hypothesis if, for the second outcome measure, the hypothesis was not refuted. If for the second outcome measure the hypothesis was refuted, we counted the study as one in which the overall hypothesis was not supported.

In this paper we present the overall results of our review and highlight findings from representative studies. The highlighted studies illustrate our qualitative synthesis of the evidence and make points that we considered important to understanding the state of the current evidence base—including its implications and limitations—on the rationale for health professions diversity.

RESULTS

Our initial search produced 586 titles and abstracts, of which 66 appeared potentially relevant. Of these, 35 met our inclusion criteria. Our supplemental search strategies added 20 studies meeting our inclusion criteria, resulting in a total of 55 included studies: 17 for service patterns, 36 for concordance, and two for trust in health care. We were not able to identify any empirical studies addressing the hypothesis that greater health professions diversity results in greater advocacy or implementation of programs and policies targeting health care for minority or other disadvantaged populations.

SERVICE PATTERNS

Racial and Ethnic Minority Health Professionals. We identified 17 studies addressing the service patterns of racial and ethnic minority health professionals. Of these, 16 examined physicians' and one reported dentists' service patterns. These studies were overwhelmingly consistent in supporting the hypotheses that minority health professionals are more likely than non-minorities to serve both minority and other underserved populations, including the poor and uninsured (Table 2, Appendix A).

Thirteen separate studies have documented that minority physicians tend to provide a disproportionately large share of health care for patients from their own racial and ethnic backgrounds.[18-30] In one recent study, Bach and colleagues found that in a national sample of Medicare beneficiaries, 22 percent of African-American patients' visits in 2001 were to African-American physicians, who make up roughly 4.5 percent of the Nation's physicians.[18] Notably, this disproportionate pairing appears to be a result of both African-American physicians locating their practices in African-American communities, and of African-American patients' preferentially seeking out African-American physicians. Bach at al. found that African-Americans physicians comprised 12.5 percent of physicians in the service areas where African-American patients sought care, well above the representation of African-Americans in the physician workforce, but well below the proportion of race concordant visits between African-American patients and physicians.[18] In another study, Saha and colleagues found that African-American patients tended to choose African-American physicians, independent of the convenience of the physicians' office location.[29] This disproportionate pairing of patients and physicians of the same race is true not only for African-Americans but also for other racial and ethnic minorities. In a national survey from 2001, 24.5 percent of African-Americans, 27.6 percent of Latinos, and 45.3 percent of Asians reported having a regular physician from their own racial group, figures that are all well above the proportion of each of these racial groups in the U.S. physician workforce.[28] Finally, it should be noted that minority physicians not only disproportionately serve patients from their own racial and ethnic groups, but they also disproportionately serve other minority patients as well.[20, 24, 31]

In addition to serving minority populations, minority health professionals tend to serve other disadvantaged populations to a greater extent than non-minority professionals do.[19, 21-24, 26, 27, 30-34] Studies have provided compelling evidence that minority physicians are more likely than non-minority physicians to care for poor patients,[19, 21, 23, 24, 30, 33] those insured by Medicaid [19, 22-24, 30-33], those without health insurance,[19, 23, 24, 31, 33] and those living in areas with health professional shortages.[22, 23, 33] In the one study we identified that examined service patterns for minority health professionals other than physicians, Mofidi et al. found that among dentists who

had served in the National Health Service Corps (NHSC)—a program providing loan repayment to health professionals in exchange for a period of service in an underserved community—African-American race was the strongest predictor of continuing to work in the underserved community beyond the NHSC obligation period.[34]

Some of the studies cited above have addressed key issues relevant to minority providers' service of the underserved. First, some may argue that minority professionals serve in minority and underserved communities not by choice but because they are less able, possibly due to lower academic performance, to compete for positions in more affluent communities. Two studies, however, examined service patterns at the University of California, San Francisco, and the University of California, San Diego, both ranked among the most prestigious medical schools in the Nation.[35] These studies revealed that even among students from these elite institutions, whose graduates likely have substantial choice regarding practice type and location, minority physicians were substantially more likely than their non-minority classmates to serve minority and underserved communities.[23, 27]

Second, several studies have demonstrated that race is a stronger predictor than socioeconomic background of serving the underserved.[19, 31, 33] For instance, Brotherton et al. demonstrated in a national sample of pediatricians that URM physicians cared for more Medicaid and uninsured patients than non-URM physicians, regardless of socioeconomic background. In fact, URM pediatricians from relatively privileged backgrounds, as measured by having parents who were professionals or had at least a college degree, cared for more uninsured and Medicaid patients than non-URM physicians from underprivileged backgrounds.[31] Findings such as this indicate that, with regard to increasing the number of health professionals caring for underserved populations, diversity programs targeting only individuals from socioeconomically disadvantaged backgrounds will likely be less effective than programs that explicitly consider race and ethnicity.

Finally, findings from several studies have countered the notion that providing health professionals with financial incentives to serve underserved populations may substitute for diversity programs as a way to ensure adequate access to care for the underserved.[30, 31, 33] These studies have examined the primary financial incentive program used for this purpose, the National Health Service Corps (NHSC). In each of these studies, while NHSC participation was associated with a higher likelihood of going on to care for underserved populations, URM race was always a stronger predictor than NHSC participation.[30, 31, 33] In fact, URM physicians *without* NHSC obligations were more likely to serve the underserved than non-URM physician *with* NHSC obligations.[30, 31] This suggests that diversity programs might be a more effective long-term investment than the NHSC, in terms of providing access to health professionals for the medically underserved.

Health Professionals from Socioeconomically Disadvantaged Backgrounds. As noted above, several studies have examined physician service patterns as a function of socioeconomic background.[19, 31, 33] Rabinowitz et al. surveyed a national sample of physicians and asked about their family income during childhood. The authors found that this measure of socioeconomic background, stratified into quintiles, was not associated with care for underserved populations, designated as: working in a federally designated Health Professional Shortage Area or Medically Underserved Area; or having a practice in which over 40 percent of patients were either uninsured, or on Medicaid or poor.[33] Similarly, Brotherton et al. did not find an association between socioeconomic background, as measured by parental education and occupation, and the proportion of pediatricians' patients who were from racial or ethnic minorities or were uninsured or on Medicaid.[31] Cantor et al. did find an association between disadvantaged socioeconomic background and care of underserved groups, though the association was relatively weak, and as noted above, was small in comparison to the effect of URM race.[19]

CONCORDANCE

We identified 36 studies addressing the effects of patient-practitioner racial, ethnic, and/or language concordance on health care access/utilization, quality, and outcomes. We defined a study as addressing *race* concordance when individuals were categorized according to the major racial/ethnic categories used by the U.S. Census Bureau: White/Caucasian, Black/African-American, Hispanic/Latino, Asian, Pacific Islander, and American Indian/Alaska Native. We labeled studies as addressing *ethnic* concordance if they considered concordance as being present between people who were from more specific subgroups, based on nationality or other affiliations. For instance, if a patient and practitioner who were both Latino were categorized as concordant, we considered this to represent race concordance. If concordance was considered present when patient and practitioner were both of Mexican origin, we considered this to represent ethnic concordance.

Most of the studies we identified examined concordance between patients and physicians, or between mental health clients and their therapists (Table 3). These studies addressed three different categories of outcome measures: access to care or utilization of health services, quality of care, and health care outcomes.

Racial/Ethnic Concordance

Studies addressing the effects of patient-practitioner racial or ethnic concordance on access to care and use of health services, quality of care, and health outcomes provided mixed results (Table 4, Appendix B).

Access/Utilization. Four studies assessed the effect of patient-physician race concordance on access to care and use of health services.[28, 36-38] In a national survey conducted in 1994, Saha and colleagues found that race concordance was associated with a lower likelihood of having unmet health needs and a greater likelihood of self-reported receipt of preventive care for African-Americans, but not for Latinos.[36] In two other studies, race concordance was not associated with receipt of appropriate preventive care or disease management services among African-Americans, Latinos, or Asians,[28] or with care seeking delays, emergency department use, or medication adherence among African-Americans with hypertension.[37] In the fourth study, Chen et al. tested the association between race concordance and use of coronary angiography among Medicare beneficiaries hospitalized for acute myocardial infarction (AMI).[38] This was an important study, in that it examined the role of patient-physician race discordance in explaining one of the most well-

documented racial disparities in health care (i.e., disparities in the use of coronary angiography).[39] The authors found that race concordance was not associated with use of coronary angiography, in both unadjusted analyses and analyses accounting for patient, physician, and hospital characteristics. It should be noted, however, that the physician whose race was determined to be concordant or discordant with the patient's in this study was the attending physician for the hospital stay. This may or may not have been a physician with whom the patient had a relationship pre-dating the hospitalization or the physician who served as the patient's principal agent in guiding decision making.

Eleven studies examined the effect of client-therapist racial or ethnic matching on utilization of mental health services.[40-50] All but one of the studies were conducted in the context of county mental health agencies in California, many of them taking advantage of administrative databases maintained by those counties.[40-49] Therapists included a broad array of health professionals, including social workers, psychiatrists, psychologists, clinical nurse specialists, and unlicensed mental health workers. The studies examined the effect of client-therapist racial or ethnic concordance on measures intended to capture adherence to outpatient mental health therapy, including the total number of visits attended and dropout from therapy. In general, the studies demonstrated that racial and ethnic concordance was associated with greater use of mental health services and lower dropout rates,[40, 42, 43, 45-50] as well as lower use of emergency services. [47] Two studies found mixed or null results.[41, 44]

Four studies assessed whether race concordance between substance abuse clients and counselors was associated with greater attendance or participation in therapy.[51-54] With the exception of one isolated finding from two separate studies by the same authors, these studies found no effect of concordance on utilization patterns among substance abuse clients. In the two studies with significant findings, African-American clients with African-American counselors were less likely to use substance abuse treatment after therapy ended.[53, 54]

Quality. Thirteen studies evaluated the association between patient-physician race concordance and quality of care.[28, 36, 37, 55-63] Most of the studies used patients' ratings of interpersonal care (e.g., patient satisfaction) as the principal measure of quality. The majority of these studies found that race concordance was associated with better interpersonal care.[36, 55-58, 60, 61, 63] Another study found a similar association between patient-counselor race concordance and empathy for substance abuse clients.[51]

Three of the studies went beyond interpersonal care to evaluate the impact of concordance on other measures of quality.[28, 59, 62] One study found no association between patient-physician race concordance and parents' evaluations of both interpersonal and technical aspects of their children's primary care.[62] In another study, race concordance was not associated with patients' self-reported receipt of appropriate primary care services, such as cholesterol screening or diabetes management for eligible patients.[28] In the third study, King and colleagues examined the quality of care for patients with human immunodeficiency virus (HIV) infection in a large national cohort. They found that patient-provider race concordance among African-Americans was associated with shorter time to receipt of protease inhibitors—medications known to reduce progression to the acquired immunodeficiency syndrome (AIDS) and to prolong life [64, 65] —even after accounting for other patient and provider characteristics.[59] Moreover, the authors found that in the cohort overall, White patients received protease inhibitors earlier than African-Americans, but that among patients with race concordant providers, this disparity was eliminated.

This study is important for two reasons. First, it is one of only two studies that examined the effects of race concordance on the use of health care services proven to reduce morbidity and mortality.[28, 59] Second, the study demonstrated that race concordance was associated with elimination of disparities in an important aspect of treating HIV/AIDS, a disease known to disproportionately affect African-Americans. These two facets of the study suggest that patient-physician race concordance has the capacity to reduce racial disparities not only in health care, but in health and mortality.

Another noteworthy study examined the impact of race concordance on the quality of patients' communication with their primary care providers.[56] In this study, Cooper and colleagues audiotaped doctor-patient encounters and analyzed the content of the encounters. They found that doctor-patient race concordance was associated with longer visits and measurably better communication.[56] They also found that patients were more satisfied with the visit and rated the doctor as fostering more doctor-patient partnership in race concordant encounters. Notably, however, the authors found that the differences in communication and the differences in patients' ratings of the visit were independent of each other; i.e., accounting for the differences in communication did not explain any of the differences in patients' ratings of their doctors. This finding is important in that it illustrates that race concordance is associated not only with better communication but also with other unmeasured aspects of the doctor-patient encounter that give rise to higher patient ratings of health care quality. This suggests that while communication training for health professionals may improve the quality of care for minority patients, it is unlikely to serve as a substitute for increasing the number of minority health professionals, which would increase minority patients' ability to see race concordant providers if they choose to.

Outcomes. Twelve studies tested for associations between patient-practitioner racial or ethnic concordance and health outcomes.[38, 41-44, 48-51, 53, 54, 63] In most of these studies, the outcome of interest was improvement in global mental health status after a course of mental health counseling or therapy.[41-44, 48-50] These studies produced mixed results, with no clear pattern for patients from any specific racial or ethnic group or with any specific mental health condition. Four of the seven studies did find some evidence of a positive effect of racial or ethnic concordance on mental health outcomes.[43, 44, 48, 50]

In a study comparing adjustment to disability among African-American patients with vitiligo, a disfiguring skin condition, Porter and Beuf found that patients treated at a clinic with predominantly African-American physicians and staff expressed better adjustment than those treated at a clinic with predominantly White physicians and staff.[63] This study was unique in examining race concordance with not only a single health care provider but with the majority of the clinic staff. The study was limited, however, in that it only examined two different health care settings.

Three studies examined the association between patient-counselor race concordance and substance abuse treatment outcomes.[51, 53, 54] One study assessed abstinence from substance use and found that race concordance was not associated with abstinence for any individual racial group, but that women with race concordant counselors were more likely to remain abstinent.[51] In the other two studies, which were conducted by the same group of authors, results were conflicting.[53, 54] Both studies examined cohorts of African-American patients in cocaine treatment programs. In one study, patient-counselor race concordance was associated with more medical and legal problems nine months after treatment.[53] In the other study, race concordance was associated with a lower likelihood of having been jailed within nine months of treatment.[54] Notably, in both studies, the authors tested for multiple treatment outcomes, such that the statistically significant findings mentioned above may have occurred by chance.

Language Concordance

Studies of patient-practitioner language concordance were generally more consistent than those of racial/ethnic concordance in demonstrating a positive effect of concordance on access, utilization, and quality of care (Table 5, Appendix C). Findings of these studies did not reveal a consistent effect of language concordance on health outcomes.

Access/Utilization. Seven studies assessed the impact of patient-practitioner language concordance on access to care and use of health services.[40-42, 47-49, 66] Most of these studies sought to determine whether client-therapist language concordance was associated with measures intended to capture adherence to outpatient mental health therapy, including the total number of visits attended and dropout from therapy.[40-42, 48, 49] The studies generally found beneficial effects for language concordance on these outcomes among both Latino and Asian mental health clients, though the findings were more consistent for Latinos. Another study found that client-therapist language concordance was associated with less use of emergency services for both Latinos and Asians.[47] Finally, in a study of Spanish-speaking patients with asthma, Manson found that patients in continuous relationships with language concordant primary care physicians were less likely than those in language discordant relationships to miss appointments.[66] He also found non-significant trends suggesting that language concordance was associated with greater medication adherence and fewer emergency department visits.[66]

Quality. Four studies of Latino populations tested the association between patient-physician language concordance and the quality of interpersonal care, particularly communication.[67-70] In three of the studies, language concordance was positively associated with interpersonal quality of care.[67, 68, 70] A fifth study examined the influence of patient-physician language concordance on patients' comprehension of medical information.[71] In this survey of Californians speaking one of eleven different non-English primary languages, respondents with limited English proficiency were more likely than English-proficient respondents to have problems understanding a medical situation and understanding medication labels.

When limited English-proficient patients with language discordant vs. concordant physicians were examined separately, the former group was much more likely to have problems in both of these areas. The latter group was only modestly more likely than English-proficient patients to have difficulty understanding a medical situation and were no more likely to have difficulty with medication labels. These findings, which took into account differences in demographic factors and access to care, indicate that language concordance was associated with significantly greater medical comprehension among individuals with limited English proficiency.[71]

Outcomes. Seven studies assessed the association between language concordance and health outcomes.[41, 42, 48, 49, 69, 71, 72] Four of the studies examined improvements in global mental health status after a course of mental health counseling or therapy.[41, 42, 48, 49] One study found a positive association between language concordance and improved mental health for Latinos but not for Asians;[48] the other studies found no significant associations. Another study examined a group of Latino patients with diabetes and found a non-significant trend suggesting better glycemic control among those with a language concordant primary care physician, though fewer than half of the language concordant providers were themselves Latino.[72]

Perez-Stable and colleagues found an association between patient-physician language concordance and several dimensions of patients' self-reported health status, though this was a cross-sectional

study; the authors were therefore unable to determine whether language concordance was associated with improvements in health status.[69] Finally, in the study of Californians speaking non-English languages discussed in the previous section, limited English-proficient patients with a language discordant physician were significantly more likely than English-proficient patients to report having had a bad reaction due to problems understanding medication instruction. Limited English-proficient patients with a language concordant physician were no more likely than their English-proficient counterparts to have experienced a bad medication reaction.[71]

TRUST IN HEALTH CARE

We found limited evidence addressing the hypothesis that institutional diversity enhances trust among minority or socioeconomically disadvantaged patient populations. Our search generated only two studies that indirectly addressed this hypothesis.[73, 74] In the first, Mouton and colleagues surveyed women who did not respond to an invitation to participate in a large clinical trial.[73] The authors found that 37 percent of the African-American women in the sample expressed a preference to be treated by an African-American scientist. This finding suggests that increasing the number of minority health scientists might enhance minority participation in clinical trials, which might reduce racial disparities in the benefits of medical research. This study, however, was limited in that only 29 African-American women were surveyed, and it was not clear that lack of diversity among researchers was a principal reason for lack of participation among the women who reported a preference.

In the second study, Reese et al. interviewed African-American pastors to elucidate barriers to hospice participation among terminally ill African-American patients.[74] Pastors identified lack of diversity among health professionals as a significant barrier to hospice enrollment. The authors developed and administered a survey of barriers to hospice participation that incorporated lack of diversity among health professionals as a potential barrier. While the authors found that African-Americans were more likely to endorse barriers to participation, they did not report findings for each specific barrier. It was thus not possible to determine whether lack of diversity among health care workers represented a significant barrier in their quantitative analysis.

PROFESSIONAL ADVOCACY

Insufficient evidence exists as to whether greater health professions diversity leads to greater advocacy for disadvantaged populations. While health professionals from racial and ethnic minority and socioeconomically disadvantaged backgrounds would seem more likely than others to advocate for and implement policies and programs to improve health care for disadvantaged populations, we could find no studies testing this hypothesis.

DISCUSSION

We conducted a review of publicly available studies addressing four separate hypotheses linking increased racial, ethnic, and socioeconomic diversity among health professionals to improved public health. We found a large and consistent body of evidence suggesting that minority health professionals, particularly physicians, disproportionately serve minority and other medically

underserved populations. Data generally supported the notion that minority patients receive better interpersonal care from practitioners of their own race or ethnicity, particularly in primary care and mental health settings. Patient-practitioner language concordance similarly was associated with better interpersonal care, greater medical comprehension, and greater likelihood of keeping follow-up appointments, particularly in mental health care. For two of our hypotheses—that greater health professions diversity leads to greater trust in health care and greater advocacy for disadvantaged populations—empirical evidence was scant or lacking.

Collectively, the studies in our review suggest several mechanisms by which increasing numbers of minority and socioeconomically disadvantaged health professionals in the United States. might lead to improved health outcomes. First, minority physicians, and to a lesser degree those from socioeconomically disadvantaged backgrounds, serve as a usual source of care for many of the nation's underserved populations, including those who are uninsured or underinsured. Studies have established that having access to a usual source of care improves health outcomes. [15-17] To the extent that future minority health professionals follow this pattern of disproportionately caring for the underserved, increasing minority representation among health professionals should increase access to health care for underserved groups and thereby improve population health.

Second, increasing health professions diversity would afford minority patients, particularly those from groups underrepresented in the health professions, greater opportunity to see practitioners of their own racial or ethnic background. Increased diversity would thereby improve the quality of interpersonal care that minority patients receive, and potentially increase their likelihood of receiving and accepting appropriate medical care, which would in turn lead to improved health. One study in our review supported this contention by demonstrating that African-American patients received life-prolonging medications for HIV/AIDS in a more timely manner from African-American as opposed to White physicians.

Finally, increasing the presence of underrepresented Latino and Asian health professionals in particular might afford more limited English-proficient patients the opportunity to see practitioners that speak their native language. The observation of higher-quality care in language concordant relationships—most likely a result of effective communication and possibly of cultural congruence—suggests that greater linguistic diversity among health professionals will lead to improved health outcomes and greater patient safety.[75-77] This is particularly relevant in the current context of limited funding for and use of medical interpreter services.[78]

Some caveats to these arguments for health professions diversity warrant mention. First, considering minority practitioner service patterns as the primary rationale for diversity programs may lead to the problematic expectation that minority health professionals should all serve underserved patient populations. It is important to remember that our review supports the notion that increasing workforce diversity will lead to greater access to care through the choices of minority practitioners (to serve underserved populations) and minority patients (to seek care from minority practitioners). We would consider it unethical to require practitioners to serve specific populations based on their race, ethnicity, or socioeconomic background.

Second, we caution against the conclusion that, because race concordance is associated with higher quality care, patients should always be paired with practitioners of their own race. Although studies in our review suggested that interpersonal care was *on balance* better in race concordant patient-practitioner relationships, and that patients tended to prefer practitioners of their own race, these findings did not apply to all patients and practitioners. In most studies, the majority of patients had

no preference regarding practitioner race and were very satisfied with the care they received from race discordant providers. The association between race concordance and interpersonal quality indicates that greater diversity might improve overall quality of care by affording those who do have a preference, and who do experience better care in race concordant relationship, greater opportunity to have such relationships.

Finally, it is important to note that we were not able to determine the separate effects of language concordance alone vs. language plus ethnic concordance. One path to greater patient-practitioner language concordance for limited English-proficient patients is to increase racial and ethnic diversity in the health professions. Another path is to train non-minority health professionals to speak non-English languages. This latter strategy could enhance language concordance but would lack the potential benefit of combined language and ethnic concordance. We were not able to determine whether this combined concordance was more beneficial than language concordance alone. Thus, while our review suggested a potential benefit from increasing language concordance in patient-practitioner encounters, it did not establish whether achieving this benefit is best accomplished by training more minority health professionals or by training existing and future health professionals to speak non-English languages.

Study Limitations

There were several limitations to our review. Our search strategies may not have captured all relevant studies. We took several measures to ensure a comprehensive search, including reviewing reference lists and Web sites and consulting with experts. It is possible, though, that important studies were missed. We only searched for publicly available studies. Some studies relevant to our review may have been conducted by private institutions that did not disseminate their findings to the general public. It is also possible that our review was affected by publication bias, as some authors may have selectively chosen not to publish results either supporting or refuting the hypotheses we addressed.

Recommendations for Future Research

Our review revealed several gaps in the evidence base related to health professions diversity that we believe are important areas for future research. Notably, nearly all the studies we found related to service patterns examined physician practices. More studies are needed to determine whether the service patterns of other professionals who serve as many patients' usual source of health care (e.g., nurse practitioners, physician assistants) vary according to race, ethnicity, or socioeconomic background. Likewise, studies of patient-practitioner racial and ethnic concordance were limited primarily to physicians and mental health practitioners. It would be useful to know about the impact of concordance between patients and other health professionals, particularly nurses, who interact closely with patients—in hospitals, long-term care facilities, doctors' offices, and even in patients' homes—and whose interpersonal interactions are therefore likely to substantially influence patients' experiences.

Future studies of racial and ethnic concordance should look beyond the quality of interpersonal care (e.g., patient satisfaction) and begin to study the impact of concordance on more objective measures of quality, including process measures (e.g., receipt of influenza vaccination among elderly and chronically ill patients) and health outcomes (e.g., glycohemoglobin level among patients with diabetes). In designing and conducting such studies, researchers should choose measures that are likely to be strongly influenced by interpersonal interactions between health care providers and patients, i.e., those for which a link with patient-practitioner concordance makes sense. Researchers should also be mindful in conducting these studies that, relative to measures of interpersonal quality,

process and outcome measures are influenced by numerous factors other than the patient-practitioner interaction. Studies examining process and outcome measures must therefore take these potentially confounding factors into account and be adequately powered to detect the influence of concordance amidst the influence of many other variables. Using data from large clinical and administrative databases is one way to harvest the kind of power that may be needed for such studies, but it will require that the databases contain, or at least can be linked to, data on patient and practitioner race. Organizations such as Aetna, who are now collecting these data routinely,[79] may serve as a resource and a model for other health care organizations interested in health professions diversity.

Studies of language concordance to date have not adequately examined the relative contributions of language concordance alone vs. combined language and ethnic concordance. It is not clear, therefore, whether the observed effects in these studies are attributable solely to language concordance or are in part explained by the ethnic (and perhaps cultural) concordance that are often present in language concordant encounters. The policy implications of language concordance studies depend, at least in part, on the relative contributions of these separate effects. If common language accounts for all of the benefits of language concordance, then interventions to enhance practitioners' non-English skills (e.g., Spanish language courses) might suffice to improve care for patients with limited English proficiency. If ethnic concordance were influential, policies to increase ethnic diversity among health professionals would likely be needed. Therefore researchers should compare the quality of care in encounters and relationships in at least three categories: concordant language/ethnicity, concordant language/discordant ethnicity, and discordant language/ethnicity. In conducting such studies, researchers should pay attention to and measure non-English fluency among practitioners and English fluency among patients, since language concordance is best conceived as a continuous (or ordinal), rather than dichotomous variable.

Studies of the effect of institutional diversity on patients' trust in health care and propensity to use health care services are lacking. Research in this area could start by measuring trust, perceived access, satisfaction, and likelihood of using services among patients receiving care at (or with the option to receive care at) health care facilities with differing levels of staff diversity. It is important that such studies account for other differences across institutions that might affect patients' attitudes and choices. Because minority professionals are more likely to practice in underserved communities, the facilities they work in may be less well reimbursed than facilities staffed predominantly by non-minority professionals. Patients' attitudes toward certain health care facilities may appear negative, despite their diversity, if those institutions have long waiting times, inadequate resources, or even an unattractive physical appearance.

It is also important in studies of the effects of institutional diversity to measure both structural diversity—the proportion of a facility's staff from different racial/ethnic groups—and interactional diversity—the degree to which patients interact with staff from different racial or ethnic groups. Structural diversity alone may be important, in that patients may trust an institution more, simply because it has a diverse workforce. But it is more likely that the influence of diversity on patients' trust and use of services, if such an influence exists, will be mediated by their experiences and interactions with individuals within that institution.

Finally, research is needed to test the proposed hypothesis that a greater presence of professionals from minority and socioeconomically disadvantaged backgrounds in the health care workforce will lead to greater leadership and advocacy, and ultimately better access and quality of care for disadvantaged populations. This research could begin with a simple survey assessing the priorities of health care leaders from different racial, ethnic, and socioeconomic backgrounds. Another study

might examine the research portfolios of researchers from different backgrounds. Do minority researchers spend relatively more effort on issues important to minority and other disadvantaged patient populations? This could be done, for instance, by examining the portfolios of NIH-funded researchers. The National Academy of Sciences (NAS) conducts periodic evaluations of NIH programs aimed at recruiting minority scientists and fostering their careers.[80] The NAS could incorporate into these evaluations an investigation of the research focus and populations studied among beneficiaries of these programs, as compared to other researchers.

CONCLUSION

Programs and policies to promote racial, ethnic, and socioeconomic diversity in the health professions are based, at least in part, on the principle that a more diverse health care workforce will improve public health. We developed a framework and reviewed publicly available evidence addressing that principle. We found that current evidence supports the notion that greater workforce diversity may lead to improved public health, primarily through greater access to care for underserved populations and better interpersonal interactions between patients and health professionals. We identified, however, several gaps in the evidence and proposed an agenda for future research that would help to fill those gaps. Conducting this research will be essential to solidifying the evidence base underlying programs and policies to increase diversity among health professionals in the United States.

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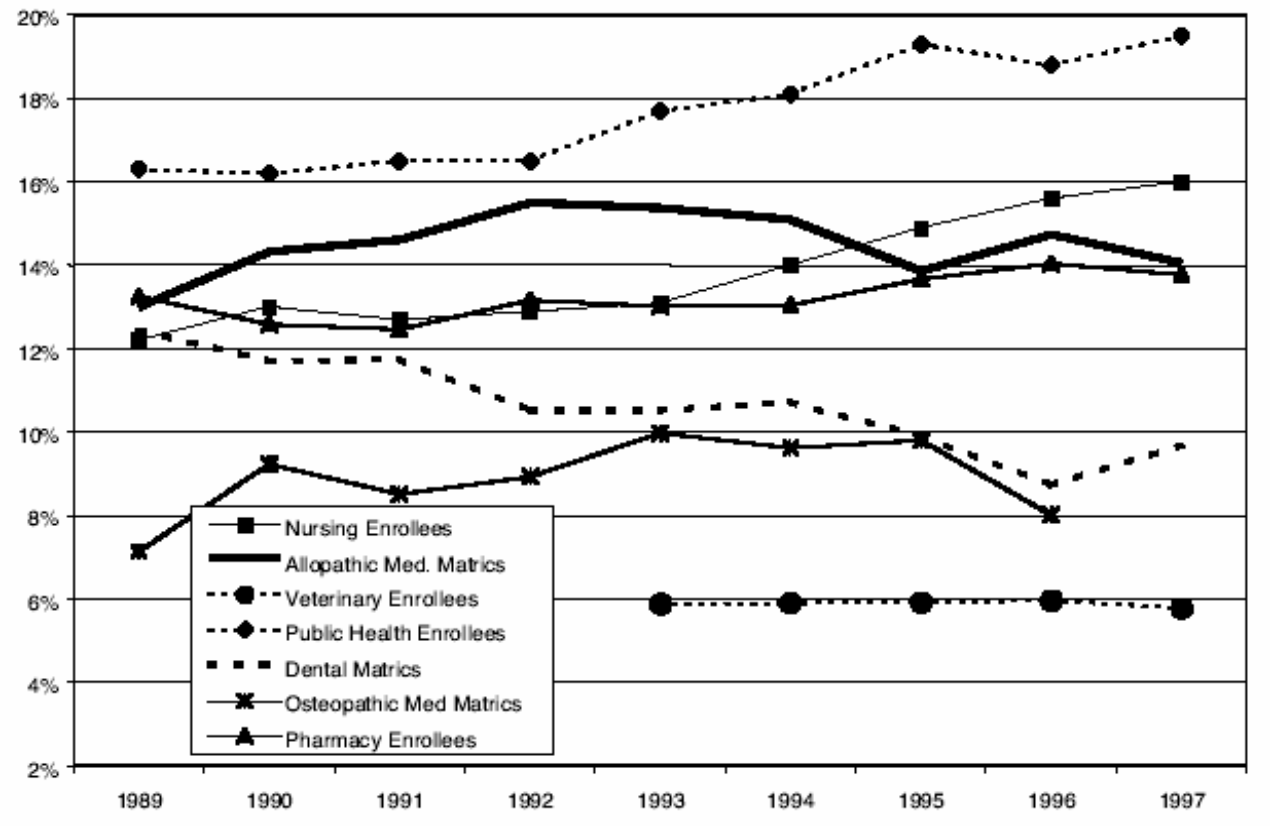
Figure 1. Recent Trends in Underrepresented Minority Enrollment in Health Professions Schools



Source: Grumbach et al. Strategies for improving the diversity of the health professions. Woodland Hills, CA: The California Endowment, 2003.

Figure 2. Conceptual Framework Linking Health Professions Diversity to Health Outcomes

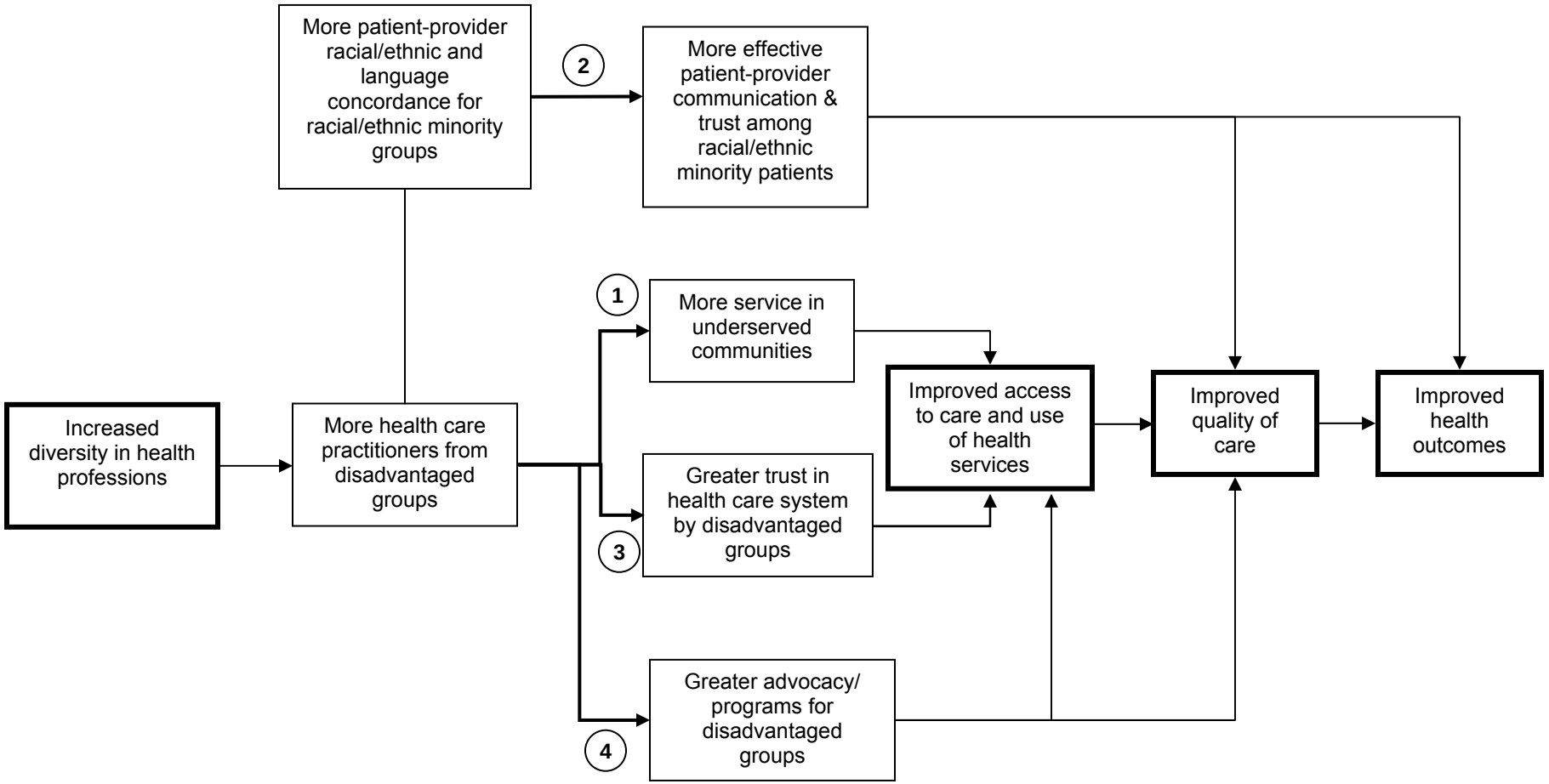


Table 1. Race/Ethnicity of U.S. Health Professionals Compared to U.S. Population, 2000

	Non-Hispanic White	Non-Hispanic Black	Hispanic	Asian/Pacific Islander	American Indian/ Alaska Native
U.S. Population (over age 18)	75.1%	12.3%	12.5%	3.7%	0.9%
Chiropractors	91.9%	1.2%	2.9%	2.7%	0.6%
Dentists	82.8%	3.4%	3.6%	9.1%	0.3%
Medical & Health Services Managers	78.5%	10.8%	5.9%	3.1%	1.0%
Optometrists	86.5%	1.7%	2.7%	8.1%	0.4%
Pharmacists	78.9%	5.1%	3.2%	11.5%	0.3%
Physician Assistants	76.2%	8.6%	8.1%	4.8%	0.6%
Physicians & Surgeons	73.6%	4.5%	5.1%	15.3%	0.3%
Podiatrists	90.0%	4.6%	1.7%	2.8%	0.3%
Registered Nurses	80.4%	9.0%	3.3%	6.0%	0.8%

Adapted from: Minorities in Medical Education: Facts & Figures 2005. Washington, DC: Association of American Medical Colleges, 2005.
Data sources: U.S. Census 2000 Special Equal Employment Opportunity (EEO) Tabulation Data; and U.S. Census Bureau, Census 2000 Summary File 1 (SF 1) 100-Percent Data.

Table 2. Results of Studies of Health Professional Service Patterns

	Number of Studies									
Practitioner Race:	**Black**		**Latino**		**Asian**		**AI/AN**		**URM**	
Hypothesis	+	0/-	+	0/-	+	0/-	+	0/-	+	0/-
Serve minority/same-race populations	12	–	8	–	4	–	1	–	2	–
Serve underserved/poor populations	6	–	4(1)	–	1	1	–	–	5	–

+ = supports hypothesis
0/- = does not support/refutes hypothesis
(#) = non-significant trend
URM = underrepresented minority, not broken down by specific race/ethnicity

Table 3. Numbers of Studies of Patient-Provider Concordance, by Provider Category and Concordant Characteristic

Health Professional Category:	Physicians	Mental health providers	Substance abuse counselors	Medical students
Race Concordance	13	4	4	1
Ethnic Concordance	0	7	0	0
Language Concordance	7	5	0	0

Table 4. Results of Studies of Patient-Provider Race and Ethnic Concordance

	Number of Studies							
Practitioner Race:	**Black**		**Latino**		**Asian**		**Minority**	
Hypothesis	+	0/-	+	0/-	+	0/-	+	0/-
Improves access/utilization	7	6	3	5	6	2	2	0
Improves quality	9	5	4	3	1	3	0	0
Improves outcomes	3	6	2	2	3	3	0	0

+ = supports hypothesis
0/- = does not support/refutes hypothesis

Table 5. Results of Studies of Patient-Provider Language Concordance

	Number of Studies					
Practitioner Race:	**Latino**		**Asian**		**Minority**	
Hypothesis	+	0/-	+	0/-	+	0/-
Improves access/utilization	3	0	4	1	2	0
Improves quality	3	1	0	0	1	0
Improves outcomes	1 (1)	2	1	3	1	0

+ = supports hypothesis
0/- = does not support/refutes hypothesis
(#) = non-significant trend

Appendix A – Service Pattern Evidence Table

Author	Year	Study design	Population	Summary	Comments
Bach	2004	Cross-sectional analysis of Medicare claims and Community Tracking Study	Primary care physicians who care for elderly patients (family medicine, general medicine, general internal medicine, geriatrics)	22% of Black patient visits nationwide were to Black physicians, which was substantially greater than the average proportion of Black physicians (12.5%) within the areas (Hospital Service Areas) where Black patients sought care and the proportion of Black physicians nationally (5.5%). These results suggest that high rates of race concordance between Black patients and physicians are due to both physicians' disproportionately serving Black communities and patients' disproportionately seeking care from Black physicians.	
Brotherton	2000	Survey	Pediatricians graduating from U.S. medical schools in 1983-1989, including both generalists and subspecialists	URMs were 4 times more likely to have NHSC obligations, were less likely to have done a subspecialty fellowship, and had higher educational debt upon graduation from medical school. URMs were significantly more likely to care for minorities and uninsured/publicly insured children. Those who had NHSC obligations also saw more minority patients, for both URM and non-URM pediatricians.	Stratified random sample, including half URM and half non-URM; average age of physicians at time of survey was 37 yrs
Cantor	1996	Cross-sectional data from surveys at 2 time points Longitudinal data with 4-yr follow-up of respondents to initial survey	Physicians age 40 or less, in practice at least 1 year	Black physicians were significantly more likely than White physicians to self-report care for poor patients and Black patients. Latino physicians were more likely than Whites to report care for Latino patients, poor, and uninsured. In all cases, women minorities were more likely to do so than men. White women were slightly more likely than men to report care for poor patients. Measures of physician SES background were weakly associated with increased care of underserved patient groups. Educational debt was unrelated to care of underserved populations. In the longitudinal cohort, few changes were seen in service to the underserved over a 4-year period. Independent of race/ethnicity, physicians caring for a high proportion of underserved were less likely to report high satisfaction with current practice, experienced more discrimination, and earned less than they considered adequate incomes.	Minorities oversampled; 44% longitudinal response rate; controlled for SES background of MDs.

Gray	1997	Analysis of 1987 National Medical Expenditure Survey	National sample of patients, focused on those reporting a usual provider	Minority patients were less likely to have a regular physician (71% nonminority; 55% Black; 51% Latino). This trend persisted after controlling for SES. Of those with a regular physician, 88% of non-minorities, 19% of Blacks, 29% of Latinos and 26% of other minorities reported race concordant MDs. After controlling for SES, Latinos and Blacks were over twice as likely to have a minority physician than non-minorities, with race concordant relationships most common.	Controls for patient SES
Johnson	1989	1985-86 survey of graduates of Howard University College of Medicine	Survey spanning 49 graduating classes from Howard University College of Medicine	Patient panels of Black physicians were 64% Black and 19% "very poor." Black graduates cared for slightly more poor patients than non-Black graduates of Howard University, an historically Black medical college.	
Keith	1985	Survey and secondary data analysis	All minority graduates and a stratified random sample of nonminorities in a single class (1975) of US medical school graduates	Minorities were more likely to choose primary care specialties (especially Ob/Gyn and pediatrics). Minorities practiced in federal manpower shortage areas at nearly twice the rate of nonminorities (true in all specialty categories). SES background of minorities did not significantly impact specialty choice or location in shortage areas (in contrast to nonminorities). Black MDs were significantly more like to care for Black patients; the same pattern was observed for Latino, Asian, American Indian, and White MDs. Minority physicians were not more likely than Whites to care for other (nonconcordant) minority groups. Black and Hispanic MDs were more likely to treat Medicaid patients than White MDs. Minorities were 40% less likely to be board-certified.	Oversampled nonminorities to match preadmission characteristics and medical schools of minorities; included Ob/Gyn in primary care; controlled for SES background and medical school performance of physicians
Komaromy 1996		Survey	California statewide analysis of per capita workforce of primary care physicians	Population race and ethnicity were inversely related with per capita primary care physician workforce. Black physicians were more likely to practice in areas in the top 85% of communities in terms of proportion of population who were Black. Similar results were found for Latino physicians and Latino communities. Black physicians cared for 42.9% more Blacks than other physicians. In unadjusted analyses, Black physicians saw more patients insured by Medicaid, and Latino physicians saw more uninsured patients as compared to physicians of other race/ethnicity.	

Mofidi	2002	Survey	Dentists who had participated in NHSC, and had post-service obligation	Strongest predictor of continuing to work with underserved was Black race. Latinos were also more likely to continue working with the underserved in bivariate analyses, but were grouped with nonAfrican-Americans in multivariate analysis. Also independently associated was altruism towards serving underserved prior to NHSC position.	
Moy	1995	Analysis of 1987 National Medical Expenditure Survey	National sample of patients, limited to those reporting a specific physician as their usual source of care	Overall, 14% of patients identified a nonWhite physician as their usual source of care (34% of minorities, 11% of non-Hispanic Whites). Medically indigent patients were more likely to see nonWhite physicians. Black and Latino patients were more likely to receive care from Black MDs. Black and "other" minorities more likely to receive care from Asian MDs. Medically indigent patients were more likely to receive care from Black and Asian MDs than other patients. Those identifying a nonWhite physician had poorer self-reported health status. Adjusting for physician gender, specialization, workplace, and geographic region did not affect the results.	
Murray-Garcia	2001	Analysis of administrative data of patients and visits to resident continuity clinics	Residents at Children's Hospital Oakland 1998-99	Highest proportions of visits by Blacks, Asian, and Latino patients were made to residents of same racial or ethnic group, most notably for Latino patients. Latino patients were more likely to see Latino residents than Spanish-speaking non-Latino residents.	High minority patient population (5% White); no information on how patients were assigned or chose resident physicians
Pathman	1996	Survey	NHSC physicians located in non-metropolitan communities	Minority physicians were less likely to be board certified than nonminorities within each specialty (most pronounced for general internal medicine). Minorities were less interested in practicing in rural areas than nonminorities, and more interested in having "amenities of city living," and on average practiced in larger towns. Minorities anticipated serving in rural areas for a shorter duration than nonminority counterparts. Minority physicians placed a higher value on serving a particular racial/ethnic group than nonminority physicians. Minority physicians cared for a disproportionately high number of minorities within their communities.	

Penn	1986	Survey of University of California at San Diego graduates	Survey of all graduates admitted under a program targeting socioeconomically disadvantaged students between 1973-81, and an equal number of randomly selected graduates admitted under traditional admissions process, matched by year of graduation.	More students in the special admissions group (who were predominantly Black and Hispanic) practiced in rural and inner city settings than those in traditional admissions group. Additionally, the special admissions group reported caring for a greater percentage of minority patients, in a race concordant manner.	No statistical analyses were conducted. No comparisons made of URMs admitted through standard admissions process with those admitted through special admissions process.
Perloff	1997	Analysis of 1993 and 94 AMA Socioeconomic Monitoring System survey	Primary care physicians in urban areas, excluding those who were employees or in large medical groups	By self-report, African-American and Hispanic physicians were more likely than White physicians to participate in Medicaid, and among those participating to have a higher percent of patients covered by Medicaid. In multivariate analysis including personal, practice, community, and State Medicaid policies, African-American race was the only personal or practice characteristic predicting increased service to the Medicaid population (OR 3.45).	
Rabinowitz	2000	Survey	Family/general physicians, general internists, general pediatricians	Factors independently associated with providing substantial care to the underserved included URM (strongest association), grew up in inner-city or rural area, participation in NHSC, and strong interest in underserved practice prior to entering med school. Factors not associated (in multivariate analysis): gender, family income when growing up, clinical experience with the underserved during medical school.	Stratified (by specialty and quartile rank of medical school for proportion of primary care physicians produced) random sample of physicians; substantial care to underserved included practice in a designated underserved area, more than 40% of patients uninsured, on Medicaid, or poor

Saha	2000	Analysis of 1994 National Comparative Survey of Minority Health Care (Commonwealth Fund)	Black, Latino and White respondents who reported a regular physician	Black (4% of all U.S. physicians) and Latino physicians (5%) cared for a disproportionate number of Black and Hispanic patients (25% and 23%, respectively). Analyses indicate this is due to both chosen practice locations of these physician groups, coupled with patient preferences for race concordant physicians.
Saha	2003	Analysis of 2001 Health Care Quality Survey (Commonwealth Fund)		Patient-physician race concordance for Blacks, Latinos and Asians was high. However, only 10% of respondents reported a preference for a physician of their own race/ethnicity.
Xu	1997	Survey and analysis of American Medical Association Physician Masterfile data	Family physicians, pediatricians, and general internists who graduated from medical school in 1983 or '84	URMs were more likely to have grown up in inner-city or rural area and to have had a lower childhood family income, and a higher mean debt upon graduation. NHSC obligations: 50% of Blacks, 25% of Latinos 10% Whites, and 8% Asians. URMs reported caring for a higher proportion of underserved populations. URM race was a stronger predictor of serving poor and Medicaid patients than NHSC obligations. All race/ethnic groups reported a significant degree of race concordance with their patient population.

Appendix B – Race Concordance Evidence Table

Author	Year	Study Design & Methods	Patient Population	Health Professional Group(s)	Concor-dance Type	Outcome(s)	Results	Comments
Chen	2001	Retrospective cohort Medical record review	35,676 White and 4,039 Black Medicare beneficiaries $\geq$ 65, hospitalized for acute myocardial infarction, 1994-95	Attending physician of record during hospital stay	Race	1. Receipt of cardiac catheterization [ut] 2. Mortality [oc]	Race concordance was not associated with differences in cardiac catheterization use or mortality.	The attending physician may or may not have been the PCP.
Chen	2005	Cross-sectional Telephone survey	3,884 Black, Latino, and White adults in the U.S., 1999	PCP	Race	1. Satisfaction with physician [qu]	Race concordance was associated with greater patient satisfaction among Blacks, Latinos, and Whites who explicitly preferred a race concordant PCP. For those who preferred a race discordant PCP or had no preference, race concordance was not associated with satisfaction.	The results were not adjusted for potential confounding factors. Patients' preferences for race concordant PCPs was associated with perceived racism in the health care system.
Cooper	2003	Cross-sectional Written surveys and audiotape analysis	142 Black and 110 White patients in 16 primary care practices in the Baltimore, MD, and Washington, DC areas, from 1998-99	PCP	Race	1. Patient-physician communication content [qu] 2. Patients' ratings of physicians' participatory decision making style [qu] 3. Patient satisfaction with visits [qu]	Race concordance was associated with longer average visit duration (17 vs. 15 minutes), slower speech speed, and more positive patient affect. Race concordance was also associated with higher patient ratings of physicians' participatory decision making and higher patient satisfaction.	
Cooper-Patrick	1999	Cross-sectional Telephone survey	784 White and 814 Black patients in 32 primary care practices associated with a single urban managed care organization in the Washington, DC metropolitan area, from 1996-98	PCP	Race	1. Patients' ratings of physicians' participatory decision making style [qu] 2. Patient satisfaction with visits [qu]	Race concordance was associated with higher patient ratings of physicians' participatory decision making and higher patient satisfaction.	

Fiorentine	1999	Prospective cohort Face-to-face and telephone interviews	302 clients (96% Black, Latino, or White) at 25 substance abuse treatment facilities in the LA metropolitan area	Substance abuse counselors	Race	1. Perceived counselor empathy [qu] 2. Engagement in therapy (frequency of participation) [qu] 3. Abstinence [oc]		
Flaskerud	1990	Retrospective cohort Administrative database analysis	543 episodes of outpatient mental health care for Southeast Asian patients (mainly Vietnamese & Cambodian) in Los Angeles (LA) County, 1983-88	Social workers, psychiatrists, psychologists, psychiatric nurse specialists, unlicensed mental health workers	Ethnicity Language	1. Mental health visits [ut] 2. Dropout from therapy [ut] 3. Improved GAS scores [oc]	Controlling for sociodemographic, diagnostic, and treatment variables, and severity of illness, language concordance, but not ethnic concordance, was associated with a higher number of visits. Neither language nor ethnic concordance predicted dropout from therapy, with the exception that language concordance between Cambodian patients and non-Cambodian therapists predicted higher dropout rates. There were no associations with improved GAS scores.	Many patients studied were likely refugees with history of emotional trauma. Dropout rates in this population were low (16%). GAS scores improved for fewer than ½ of patients.
Flaskerud	1991	Retrospective cohort Administrative database analysis	1,746 episodes of outpatient mental health care for Chinese, Korean, Filipino, & Japanese patients in LA County, 1983-88	Social workers, psychiatrists, psychologists, psychiatric nurse specialists	Ethnicity Language	1. Mental health visits [ut] 2. Dropout from therapy [ut] 3. Improved GAS scores [oc]	Controlling for sociodemographic, diagnostic, and treatment variables, both ethnic and language concordance were significantly associated with a higher number of visits. Ethnic + language concordance (but neither alone) was predictive of lower dropout rates. This appeared to be driven by ethnic concordance, as ethnic concordance was predictive of lower dropout rates even among English-speaking Asian clients. There were not associations with improved GAS scores.	GAS scores improved for fewer than ½ of patients.
Flaskerud	1986	Retrospective cohort Chart review	300 Black, Mexican, Asian, Vietnamese, Filipino, & White clients at 4 community mental health agencies in Southern California, 1981-82	Mental health social workers (2/3), psychiatrists, psychologists, psychiatric nurse specialists	Ethnicity Language	1. Dropout from therapy [ut]	Controlling for sociodemographic, diagnostic, and treatment variables, both ethnic and language concordance were significantly associated with lower dropout rates and were among the strongest predictors of continued therapy.	
Fujino	1994	Retrospective cohort Administrative database analysis	1,132 Asian women, 800 Asian men, 1,568 White women, and 1,264 White men using outpatient services in LA County mental health facilities, 1983-88	Social workers, psychiatrists, psychologists, psychiatric nurse specialists, unlicensed mental health workers	Ethnicity (and gender)	1. Mental health visits [ut] 2. Dropout from therapy [ut] 3. Improved GAS scores [oc]	Joint ethnic/gender concordance was associated with lower dropout rates and longer duration of therapy for Asian and White women (compared to joint ethnic/gender discordance). Ethnic concordance was associated with longer duration of therapy and improved GAS scores for Asian men.	

<table>
<tr>
<td>Gamst</td>
<td>2000</td>
<td>Retrospective cohort
Administrative database analysis</td>
<td>4,554 Black, Latino, Asian, and White adult mental health outpatients in eastern LA County, 1994-98</td>
<td>Psychologists, social workers, family/marriage counselors, other mental health professionals, substance abuse counselors</td>
<td>Race</td>
<td>1. Improved GAF scores [oc]
2. Mental health visits [ut]</td>
<td>No consistent patterns were observed. Race concordance was associated with fewer visits for Latino and Black patients, more visits for Whites, and no difference for Asians. Race concordance was associated with GAF scores as follows:
<table>
<tr><th></th><th>All patients</th><th>Schizophrenia</th><th>Mood disorders</th><th>Adjustment disorders</th></tr>
<tr><td>Black:</td><td>Worse GAF</td><td>Improved GAF</td><td>Worse GAF</td><td>No change</td></tr>
<tr><td>Latino:</td><td>Improved GAF</td><td>Improved GAF</td><td>Improved GAF</td><td>No change</td></tr>
<tr><td>Asian:</td><td>No change</td><td>Improved GAF</td><td>Improved GAF</td><td>No change</td></tr>
<tr><td>White:</td><td>No change</td><td>Worse GAF</td><td>No change</td><td>No change</td></tr>
</table>
</td>
<td>Whereas "dropout" from therapy represents discontinuation despite recommended continuation, the meaning of results for total number of visits is less clear. Also, it is not clear whether concordance influenced outcomes because of better therapy or different judgments of therapeutic outcomes by therapists from different ethnic backgrounds. Finally, the authors examined race concordance (e.g., Asian-Asian), but not the more specific ethnic concordance (e.g., Chinese-Chinese).</td>
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<tr>
<td>Garcia</td>
<td>2003</td>
<td>Cross-sectional
Focus groups</td>
<td>49 Black, Latino, and White patients at an academic general medicine clinic in Sacramento, CA, 1998-99</td>
<td>PCP</td>
<td>Race</td>
<td>1. Quality of patient-PCP interactions [qu]</td>
<td>Black men and women and Latino men generally perceived better communication with race concordant PCPs, due to greater interpersonal comfort and shared culture. Latina women denied the importance of PCP race, but non-English proficient Latinas did validate the importance of language concordance.</td>
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<tr>
<td>Gotthiel</td>
<td>1994</td>
<td>Design and methods not described</td>
<td>634 patients (92% Black) undergoing intake evaluation for first-time admissions to a public outpatient cocaine treatment center in a large Northeastern US city</td>
<td>Substance abuse counselors</td>
<td>Race</td>
<td>1. Return visits after initial intake [ut]</td>
<td>Black patients had similar return rates whether evaluated initially by a White or Black counselor.</td>
<td>The study included 8 counselors, 5 Black and 3 White.</td>
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<tr>
<td>Howard</td>
<td>2001</td>
<td>Cross-sectional
Face-to-face interviews</td>
<td>1,416 Black and 1,451 White elders (≥ 65) with hypertension, in 4 rural and 1 urban county in North Carolina, 1986-87</td>
<td>Usual-care physician</td>
<td>Race</td>
<td>1. Medication prescription [qu]
2. Medication adherence [ut]
3. Care-seeking delays [ac]
4. Emergency department use [ut]
5. Satisfaction with care [qu]</td>
<td>For Black elders, race concordance was not associated with any of the outcome measures after accounting for other demographic and health-related variables (race concordance appeared to be associated with lower patient satisfaction among Blacks, but the authors do not comment on the statistical significance of this finding). For White elders, race concordance was associated with a lower likelihood of delaying care-seeking and greater satisfaction with care.</td>
<td>Black physicians in this study were less likely than White physicians to be board certified and more likely to work in primary care and community health centers. The authors also note that the South's history of segregation in the medical care system may have affected elders' perceptions of Black physicians. Only 3 Black physicians cared for White patients.</td>
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Jerrell	1998	Cross-sectional Administrative database analysis	4,656 Black, Latino, Asian, and White child and adolescent mental health patients in county mental health agencies in a California county, 1992-93	Mental health staff (disciplines not specified)	Race	1. Ambulatory mental health visits [ut] 2. Intensive mental health services use [ut]	After adjusting for sociodemographic factors and diagnosis, race concordance was associated with more ambulatory service use and less use of more intensive mental health services, specifically day treatment services. Race concordance was not associated positively or negatively with emergency department use or hospitalization.	The authors examined race concordance (e.g., Asian-Asian), but not the more specific ethnic concordance (e.g., Chinese-Chinese). Service use outside public mental health agencies may have occurred and would not have been captured.
King	2001	Prospective cohort Chart review, survey	1,241 Black and White adults with known HIV infection who made at least one non-emergency department visit to a medical care provider in the continental U.S., 1996	PCP	Race	1. Time to receipt of protease inhibitor therapy [qu]	In analyses adjusting for patient and provider characteristics and patients' attitudes toward their providers, race concordance was associated with shorter time to receipt of protease inhibitors among Black patients but longer time to receipt of protease inhibitors for White patients.	
Lin	2002	Cross-sectional Face-to-face interviews	50 Asian (primarily Chinese and Korean) and 89 White adults $\geq$ 35 in a mall in the Northeastern U.S.	PCP	Race	1. Satisfaction with physician [qu]	Race concordance was associated with greater satisfaction with PCPs and greater likelihood of recommending a PCP, among Asians but not among Whites.	The association between race concordance and ratings of physicians among Asians was independent of cultural similarity between patient and physician, as measured by patients' perceptions on a 4-item scale.
Malat	2001	Cross-sectional Face-to-face interviews	586 Black and 554 non-Black (nearly all White) adults in Detroit, MI, 1995	PCP	Race	1. Patients' ratings of physicians on showing respect [qu] 2. Patients' ratings of adequacy of time spent during last visit [qu]	Race concordance was associated with higher patient ratings of physicians on showing respect, but not on adequacy of time spent.	Adjusting for race concordance reduced but did not eliminate the association between Black patient race and lower ratings of physicians on showing respect.
McCabe	2002	Prospective cohort	50 Mexican American children admitted to an outpatient community mental health clinic in San Diego County, 1998	Psychology trainees, licensed clinical social workers, psychiatrists, clinical psychologists	Ethnicity	1. Dropout from therapy [ut]	Ethnic concordance was not associated with dropout rates in bivariate analysis.	After adjusting for demographic factors, acculturation, and attitudes and expectations regarding therapy, ethnic concordance was strongly associated with a lower dropout rate.

Porter	1994	Cross-sectional Face-to-face interviews	90 Black patients 16 and older with vitiligo, receiving care at 2 specialty clinics--one with largely Black staff and physicians and the other with largely White staff and physicians--at university hospitals in the Eastern U.S.	Dermatologist and staff	Race	1. Adjustment to disability (vitiligo) [oc] 2. Satisfaction with care [qu]	Black patients treated in the clinic with a predominantly Black staff expressed better adjustment to their disability than patients treated in the clinic with a predominantly White staff. In qualitative interviews, Black patients in the clinic with Black staff were rated as more satisfied with their care than those in the clinic with predominantly White staff, particularly on the affective dimensions of trust and comfort.	The study examined only 2 clinics. While the investigators adjusted for numerous potential confounders, there may have been unmeasured aspects of the clinics that contributed to differences in adjustment. The presence of more Black patients at the "Black" clinic contributed to the higher ratings of care at that clinic.
Rosenheck	1995	Prospective cohort	910 Black and 3,816 White U.S. military veterans with post-traumatic stress disorder, treated at 53 different sites	Mental health providers (physicians, psychologists, nurses, social workers, other)	Race	1. Treatment attendance [ut] 2. Clinical improvement [oc]	Black patients, and to a lesser degree White patients, were less likely to terminate treatment when the clinician was Black rather than White. For Black patients, race concordance was associated with higher attendance, greater commitment to treatment, and clinician-rated improvement in violent behavior, but not in 14 other dimensions.	Because the study took place in the VA health care system, where patients are generally assigned to clinicians, selection bias was minimized.
Saha	1999	Cross-sectional Telephone survey	3,120 Black, Latino, and White adults in the continental U.S., 1994	Regular doctor	Race	1. Satisfaction with physician [qu] 2. Satisfaction with health care [qu] 3. Preventive care use [ut] 4. Foregoing needed health care [ac]	For Black patients race concordance was associated with higher ratings of physicians on providing good health care overall, treating patients with dignity and respect, listening, explaining, and being accessible. Race concordance among Blacks was also associated with greater likelihood of reported preventive care use and lower likelihood of foregoing needed health care. Latinos with race concordant physicians reported greater satisfaction with their health care overall.	Fewer than a third of the Latinos in this study were immigrants, and 70% spoke primarily English.
Saha	2003	Cross-sectional Telephone survey	6,299 Black, Latino, Asian, and White adults in the continental U.S., 2001	Regular doctor	Race	1. Patient ratings of quality of most recent physician interaction [qu] 2. Patient ratings of physician's cultural sensitivity [qu] 3. Patient satisfaction with health care [qu] 4. Use of appropriate primary care services [ut, qu]	Race concordance was associated with greater patient satisfaction among Whites. No associations between race concordance and the other outcome measures were found.	Questions addressing race concordance in this survey referred to patients' regular doctor, while questions addressing quality of physician interaction referred to the patient's most recent visit, which may or may not have been with the regular doctor.

Snowden	1995	Cross-sectional Administrative database analysis	All Black, Latino, Asian, and White adult mental health patients in county mental health agencies in a California county, 1987-88, 1989-90	Licensed professional, unlicensed professional, and non-professional mental health workers (disciplines not specified)	Race Language	1. Emergency visits [ut]	Race concordance was associated with lower rates of emergency visits for Black, Latino, and Asian clients. Language concordance was also associated with lower rates of emergency visits for both Latino and Asian clients.	Service use outside public mental health agencies may have occurred and would not have been captured. The proportion of minority patients served by an agency was also associated with lower emergency visit rates.
Sterling	1998	Retrospective cohort Analysis of data from a clinical trial	967 Black patients admitted to a 12-week, public, outpatient cocaine treatment program in a large Northeastern US city, 1990-93	Substance abuse counselors	Race	1. Return visits after initial intake [ut] 2. Treatment retention (days in therapy) [ut] 3. 9-month utilization assessment [ut] 4. 9-month outcome assessment [oc]	Black patients had similar return rates whether evaluated initially by a White or Black counselor. Race concordance between Black patients and their primary counselors was not associated with greater retention in therapy but was associated with lower rates of post-counseling inpatient treatment use. Race concordance was also associated with more medical and legal problems at 9 months, as assessed by the Addiction Severity Index (ASI). No differences were observed on the other 6 components of the ASI, on the Risk for AIDS Behavior Inventory, or on measures of employment, education, being jailed, using cocaine, or using self-help groups.	Data for the treatment retention and outcome analyses were limited to subsets of 369 and 269 patients, respectively. The study included 10 counselors, 6 Black and 4 White. Main therapeutic modality was group therapy (race of other group members may have overwhelmed any effect of therapist race).
Sterling	2001	Retrospective cohort Analysis of data from a clinical trial	116 Black patients admitted to a 12-week, public, outpatient, one-on-one, cocaine treatment program in a large Northeastern US city	Substance abuse counselors	Race	1. Return visits after initial intake [ut] 2. Treatment retention (days in therapy) [ut] 3. 9-month utilization assessment [ut] 4. 9-month outcome assessment [oc]	Black patients had similar return rates whether evaluated initially by a White or Black counselor. Race concordance between Black patients and their primary counselors was not associated with greater retention in therapy but was associated with lower rates of post-counseling outpatient treatment use and with lower rates of being jailed at 9 months. No differences were observed at 9 months on the Addiction Severity Index, the Risk for AIDS Behavior Inventory, or measures of employment, education, using cocaine, or using self-help groups.	The study was conducted in the context of a randomized trial of different treatment modalities; participants were all volunteers for this trial. Treatment was one hour of individual therapy per week for 12 weeks. The study included 10 counselors, 6 Black and 4 White. Data for the treatment retention analyses were limited to 73 patients and 7 counselors. Data for the outcome analyses were limited to 50 patients.
Stevens	2003	Cross-sectional Telephone survey	Parents of 358 White, Latino, African-American, and Asian/Pacific Islander elementary school children, aged 5 to 12 years, enrolled in a single school district in San Bernardino, CA	PCP	Race	1. Reports of primary care quality [qu]	Race concordance was not associated with differences for any of the racial groups, in any of the dimensions of primary care quality examined.	Sample sizes within specific racial groups were small, such that the power to detect associations between race concordance and reports of primary care quality was limited within racial groups.

Sue	1991	Cross-sectional Administrative database analysis	13,439 Black, Mexican, Asian, and White adult clients at public mental health agencies in LA county, 1984-88	Primary mental health therapist	Ethnicity Language	1. Mental health visits [ut] 2. Dropout from therapy [ut] 3. Improved GAS scores [oc]	Ethnic concordance was associated with more attended sessions for all groups except English-speaking Mexican clients; with lower dropout rates for non-English-speaking Mexican, Asian, and White clients, but not for Black or English-speaking Mexican clients; and with improved GAS scores for Mexican and non-English-speaking Asian clients. Language concordance was associated with more sessions and lower dropout rates for non-English-speaking Mexican and Asian clients. Combined language/ethnic match was associated with better outcomes for non-English-speaking Asian clients.	
Yeh	1994	Cross-sectional Administrative database analysis	4,616 Black, Mexican, Asian, and White youth aged 6-17 attending public mental health facilities in LA county, 1982-88	Primary mental health therapist	Ethnicity Language	1. Mental health visits [ut] 2. Dropout from therapy [ut] 3. Improved GAS scores [oc]	Ethnic concordance was associated with more attended sessions and lower dropout rates for Asian adolescents, independent of language concordance. Language concordance, was associated with more attended sessions and lower dropout rates for Mexican adolescents, independent of ethnic concordance. Ethnic concordance was associated with lower dropout rates for Black adolescents. Ethnic concordance was not associated with any of the outcome measures for children in any ethnic group.	
Zweifler	2000	Cross-sectional Interviewing skills assessment	4 Black and 4 White female simulated patient instructors (SPIs) portraying a patient with a recent history of risky sexual behavior, 1993-95	24 Black and 180 White 2nd-year medical students at the University of Michigan	Race	1. SPI ratings of students' interviewing skills [qu]	White SPIs rated Black students' interviewing skills lower than White students' skills. Black SPIs' ratings were equivalent across student race.	Black SPIs gave students higher average skill ratings (4.2 on a 1-5 scale) than White SPIs (3.5), which may have reduced the potential for detecting significant differences by student race for Black SPIs.

[ut] = utilization

[qu]=quality

[ac] = access
[oc]=outcome

PCP = primary care provider
GAS = Global Assessment Scale
GAF = Global Assessment of function

Appendix C – Language Concordance Evidence Table

Author	Year	Study Design & Methods	Patient Population	Health Professional Group(s)	Concordance Type	Outcome(s)	Results	Comments
Fernandez	2004	Cross-sectional Face-to-face interviews (patients) Self-administered survey (PCPs)	116 Spanish-speaking Latino patients visiting a general medicine or family practice clinic at a public hospital in San Francisco, 2000	PCP	Language	1. Patient ratings of the quality of several dimensions of doctor-patient communication [qu]	Language concordance was associated with greater perceived responsiveness to patient problems and concerns.	
Flaskerud	1990	Retrospective cohort Administrative database analysis	543 episodes of outpatient mental health care for Southeast Asian patients (mainly Vietnamese & Cambodian) in Los Angeles (LA) County, 1983-88	Social workers, psychiatrists, psychologists, psychiatric nurse specialists, unlicensed mental health workers	Ethnicity Language	1. Mental health visits [ut] 2. Dropout from therapy [ut] 3. Improved GAS scores [oc]	Controlling for sociodemographic, diagnostic, and treatment variables, and severity of illness, language concordance, but not ethnic concordance, was associated with a higher number of visits. Neither language nor ethnic concordance predicted dropout from therapy, with the exception that language concordance between Cambodian patients and non-Cambodian therapists predicted higher dropout rates. There were not associations with improved GAS scores.	
Flaskerud	1991	Retrospective cohort Administrative database analysis	1,746 episodes of outpatient mental health care for Chinese, Korean, Filipino, & Japanese patients in LA County, 1983-88	Social workers, psychiatrists, psychologists, psychiatric nurse specialists	Ethnicity Language	1. Mental health visits [ut] 2. Dropout from therapy [ut] 3. Improved GAS scores [oc]	Controlling for sociodemographic, diagnostic, and treatment variables, both ethnic and language concordance were significantly associated with a higher number of visits. Ethnic + language concordance (but neither alone) was predictive of lower dropout rates. This appeared to be driven by ethnic concordance, as ethnic concordance was predictive of lower dropout rates even among English-speaking Asian clients. There were not associations with improved GAS scores.	GAS scores improved for fewer than ½ of patients.
Flaskerud	1986	Retrospective cohort Chart review	300 Black, Mexican, Asian, Vietnamese, Filipino, & White clients at 4 community mental health agencies in Southern California, 1981-82	Mental health social workers (2/3), psychiatrists, psychologists, psychiatric nurse specialists	Ethnicity Language	1. Dropout from therapy [ut]		
Lasater	2001	Retrospective cohort Administrative/ clinical database analysis and telephone and written surveys	79 Spanish-speaking and 104 English-speaking Latino patients age 35-70 with diabetes in a public health care system in Denver, CO, 1995-97	PCP	Language	1. Glycemic control [oc]	Spanish-speaking patients with Spanish-speaking PCPs had a non-significant trend toward better glycemic control than those with non-Spanish-speaking PCPs.	

Lee	2002	Cross-sectional Self-administered survey	233 English-speaking and 303 Spanish-speaking adult patients visiting a public hospital urgent care clinic in Denver, CO, 2000	Urgent care provider	Language	1. Satisfaction with visit [qu] 2. Satisfaction with provider [qu]	Language concordance was associated with greater patient satisfaction with both visit and provider.	
Manson	1988	Retrospective cohort Chart review and administrative database analysis	96 adult monolingual Spanish-speaking patients with asthma in an academic faculty group internal medicine practice in New York City, 1979-87	PCP	Language	1. Medication adherence (theophylline levels) [ut] 2. Kept appointments [ut] 3. Emergency department visits [ut] 4. Hospitalization [ut]	In analyses of the entire cohort, language concordance was not associated with any of the measured outcomes. In a subcohort of patients excluding the 37 patients with fewer than 8 appointments during the follow-up period (i.e., patients who did not regularly receive care from the group practice), language concordance was associated with fewer missed appointments, with non-significant trends toward greater medication adherence and fewer emergency department visits.	
Perez-Stable	1997	Cross-sectional Self- (or interviewer-) administered survey and chart review	226 Latino and non-Latino White patients with hypertension or diabetes at an academic general medicine clinic in San Francisco	PCP	Language	1. Health status [oc] 2. Satisfaction with health care services [qu]	Language concordance was associated with better health status in all domains tests (physical and psychological functioning, health perceptions, pain) but was not associated with differences in patient satisfaction.	
Seijo	1991	Cross-sectional Direct observation and face-to-face interview	51 Spanish-speaking Latino patients at an internal medicine clinic	PCP	Language	1. Communication [qu] 2. Information recall [qu]	Language concordance was associated with more question asking by patients and better recall of information.	
Snowden	1995	Cross-sectional Administrative database analysis	All Black, Latino, Asian, and White adult mental health patients in county mental health agencies in a California county, 1987-88, 1989-90	Licensed professional, unlicensed professional, and non-professional mental health workers (disciplines not specified)	Race Language	1. Emergency visits [ut]	Race concordance was associated with lower rates of emergency visits for Black, Latino, and Asian clients. Language concordance was also associated with lower rates of emergency visits for both Latino and Asian clients.	
Sue	1991	Cross-sectional Administrative database analysis	13,439 Black, Mexican, Asian, and White adult clients at public mental health agencies in LA county, 1984-88	Primary mental health therapist	Ethnicity Language	1. Mental health visits [ut] 2. Dropout from therapy [ut] 3. Improved GAS scores [oc]		

Wilson	2005	Cross-sectional Telephone survey	1,200 adults in California expressing a preference to complete the survey in one of 11 different non-English languages	PCP	Language	1. Understanding medical situations [qu] 2. Confusion about medications [qu] 3. Understanding medication labels [qu] 4. Adverse drug reaction [oc]	LEP patients with language discordant physicians were substantially more likely than English-proficient patients to have difficulty understanding medical situations and medication labels, and to have experienced a bad medication reaction due to not understanding instructions. LEP patients with language concordant physicians were somewhat more likely than English-proficient patients to have difficulty understanding medical situations but no more likely to have problems with medication labels or to have had a bad reaction due to not understanding medication instructions.	
Yeh	1994	Cross-sectional Administrative database analysis	4,616 Black, Mexican, Asian, and White youth aged 6-17 attending public mental health facilities in LA county, 1982-88	Primary mental health therapist	Ethnicity Language	1. Mental health visits [ut] 2. Dropout from therapy [ut] 3. Improved GAS scores [oc]		

[ut] = utilization

[qu]=quality

[ac] = access

[oc] = outcome

PCP = primary care provider

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LEP = limited English proficiency