

Deconstructing Unconscious Bias in the Health Care Workforce: An Iterative Mixed
Methods Approach

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Abstract

The prevalence of unconscious bias within the healthcare workforce is not well understood. Likewise, not much is known about the potential impacts of unconscious bias training interventions on the healthcare workforce as they have not been included in studies evaluating effectiveness. This constrains any ability to evaluate the potential for unconscious bias training as a means to reduce patient healthcare disparities. This dissertation uses an iterative mixed methods approach to examine the prevalence of unconscious bias, factors associated with individual mitigation activities, and the impact on the healthcare workforce. Results demonstrate that the unconscious biases of healthcare workers differ significantly from those of the general population and are highly variable across geographic regions and provider types. Likewise, there is some evidence to indicate that factors beyond that of the individual (i.e. type of practice and community) may potentially influence physicians' decisions to participate in unconscious bias mitigation activities. Lastly, physicians have many reasons for wanting to address unconscious bias, such as for their own personal and/or professional development. However, there is a consensus that greater accountability on the part of organizations is needed to address the upstream systemic issues that contribute to the formation and or maintenance of unconscious bias.

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Chapter 1 – Introduction

It's been nearly twenty years since the Institute of Medicine's (IOM) Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care first reported its findings that providers' biases may be contributing to racial and ethnic disparities in healthcare [1]. In that report, they emphasized the need for research that provided a greater understanding of a) the prevalence of unconscious bias and b) the processes by which it impacts differential treatment. Despite this evidence gap, health care systems and organizations have forged ahead with the implementation of preventive measures to minimize the impact of unconscious bias [2-4]. However, fast forward to 2020, a year in which a global pandemic has disproportionately impacted racial minorities, and unconscious biases are still considered to be influencing clinicians' COVID-19 diagnostic and treatment decisions [5, 6]. The impacts of unconscious bias gained even greater attention in the aftermath of the death of Dr. Susan Moore, a physician whose public pleas for more equitable treatment went grossly ignored and heightened the sense of urgency and commitment to address healthcare inequities in the post-pandemic era [7].

To be clear, bias is the attitudes, behaviors or tendencies that lead individuals to prefer, favor or evaluate more positively one group relative to another. It may be expressed consciously (explicit), where the individual is very clear in his or her feelings and or intentions or unconsciously (implicit), operating without his or her awareness and even in direct opposition to one's espoused beliefs and values. Studies have shown that despite the most egalitarian of viewpoints, bias is pervasive among all health care professions and more specifically, that clinicians harbor unconscious racial biases at the same rate or greater than the general population [8]. A clinicians' ability to deliver a

differential diagnosis and treatment that is both equitable and optimal is often limited by time, complexity and cognitive overload [1, 9]. However, the process may be further constrained by lack of cultural competency and or unconscious biases, especially when race is a factor, which has shown to increase racial health care disparities [10-13]. Clinicians' biases have been associated with a number of diagnostic and treatment recommendations, including pain, coronary artery disease, kidney dialysis, contraception and prenatal care, as well as patient-provider communication, satisfaction and adherence to treatment [14-17]. Interventions to address clinicians' unconscious bias often emphasize increasing awareness and teaching skills that mitigate its influence in clinical practice.

Physician biases have been demonstrated to begin in medical school, throughout residency training and reinforced by the health care system [18, 19]. For example, a 2017 study of first year medical students from 49 US medical schools found that faculty role modeling discriminatory behavior towards LGBTQ patients significantly increased students' unconscious biases [20]. A more recent study found that medical school curriculum, policies and culture increased students negative explicit racial attitudes, resulting in a decreased intention to practice in underserved communities or with minority populations [21]. Early evaluations of curricula designed to promote effective dialogue on race and racism for medical students has shown some promise at reducing these effects [22]. In addition, clinicians' biases have been shown to also be moderated by their personal identity (i.e. race, gender, etc.) [23, 24]. For example, in a study of implicit and explicit racial bias among medical doctors, African Americans showed no preference for either White Americans or Black Americans and females showed weaker

preference for White Americans than males. This association demonstrating the potential for personal identity to moderate unconscious bias provides further support for cultivating a diverse and inclusive healthcare workforce to reduce health care disparities [25, 26].

This dissertation serves to make a contribution by providing an examination of the prevalence of unconscious bias, influential factors beyond that of the individual and conceptualize ways in which it develops within the healthcare workforce. As the following review of the literature will demonstrate, there has been extensive study of the association between unconscious bias and patient outcomes, as well as evaluations of interventions. However, neither has produced definitive conclusions, which suggest there is a need for research that examines some of the more fundamental and principle aspects of unconscious bias in order to move this field of research forward.

Chapter 2 - Approach to the Literature

A scoping review of the literature occurred in two phases. First, with an examination of studies associating unconscious bias with clinicians' diagnostic and treatment decisions and second, with an examination of studies evaluating the effectiveness of educational training interventions with the aim of reducing unconscious bias. For the purposes of both reviews, studies were only included if they were conducted in the United States using practicing clinicians, not students or healthcare trainees. The reason for excluding international studies is two-fold. First, because the formation of unconscious bias relies on knowledge gained through social interactions and experiences, there may exist unknown contributing factors in an international context that are not applicable to the U.S. that may potentially alter findings. Second, including only U.S. based studies is significant especially in the case of racial biases. Because race is socially constructed, it can vary over time and from place to place, indicating that racial bias between countries may not be comparable. Lastly, medical students and other healthcare trainees are excluded as they are not yet in a position to make clinical decisions relevant to patient care.

Clinical Decisions

To date, there have been three systematic reviews of the literature analyzing the association of unconscious bias to clinicians' diagnostic and treatment decisions, which includes a total of 58 studies [27-29]. After applying the inclusion criteria above to these 58 studies, that reduced the number of eligible studies to 28. As a follow up, an additional search of the literature was conducted using the original combination of MeSH keywords and criteria from each of the previously published systematic reviews and by applying the additional criteria. The results returned only one new study

examining the unconscious biases of oncologists, which brought the total number of studies to 29.

To summarize, the findings have produced mixed results, which indicates that the impact of clinicians' unconscious biases on their healthcare delivery decisions is inconclusive. For example, some were able to demonstrate an effect on patient-provider communication (n=3), diagnosis (n=7) and treatment (n=11), while nearly half found no effects (n=13). Overall, the research was conducted using more than 7000 participants which included predominantly physicians from primary care specialties (i.e. internal medicine, family medicine and pediatrics), although emergency medicine, psychiatry, oncology, and surgical specialties were also represented as well as nurses. The majority of study participants were recruited using convenience sampling techniques due to their affiliation with a particular institution or organization and of those studies using random sampling methods, participants were recruited via email, phone, or mail. Each of the studies using convenience sampling were conducted at a single site. All used cross-sectional study designs consisting mostly of hypothetical patient care scenarios in assessing their outcomes. In these hypothetical situations, a participant was presented with either a video vignette, case study or patient simulation and asked to make a diagnosis or treatment recommendation to assess the impact of bias on those decisions. Each study included an assessment of participants' racial bias, with a few also including a combination of gender, age, class, and socioeconomic status bias. Three studies examined race from the perspective of medical compliance, cooperation, and attitudes.

Over half of the studies reviewed used the Implicit Association Test (IAT) developed by Harvard's Project Implicit which has been described and validated elsewhere in the literature [30, 31]. Of the remaining studies, the assumption method was used repeatedly. This method measures differences across groups; the assumption being that the majority of participants are explicitly motivated to disregard a factor such as a patient's race and therefore if a difference in diagnosis or treatment does occur it can be inferred that the result is due to an implicit or unconscious process. Differential diagnoses were most likely identified using the assumption method, whereas studies using the IAT mostly identified differences in treatment and communication. All of the studies included in this summary can be found in Appendix A.

Educational Training Interventions

The second part of this review focuses on studies designed to demonstrate the effects of unconscious bias educational training interventions. The same inclusion criteria were applied to the literature as before, however, with one major exception. Because no studies could be identified using practicing clinicians as the target study population, this review includes those studies conducted using students in pre-health professions (i.e. dietetic, medical, psychology, etc.), which might provide some indication as to the appropriateness of these interventions for practicing clinicians in the future. However, even with the expanded criteria, this still only resulted in fewer than ten studies, which also included one systematic review, and as before, outcomes varied [32-36]. For example, in one study an intervention was determined to be effective at reducing unconscious racial biases among psychology students, but in another completely separate study, the same intervention increased them in a different group of psychology students [33, 34]. Other than demographics, not much if anything is known

about the participants in these studies. Having additional contextual factors beyond just demographics may provide some indication as to why an intervention would work in one group and not another.

The studies in this review were conducted much in the same way as those in the previous review. They consisted mostly of cross-sectional designs, using convenience samples for their study populations, and primarily examined effects on Black/white racial bias, however some also looked at obesity bias. Effects were often measured using pre/post analysis of implicit association test scores however, due to small sample sizes and only minimal information provided regarding the analytical methods, even those that demonstrated some positive effect at reducing unconscious bias were unable to produce statistically significant effects to be considered reliable enough for practical widespread use [32]. It is worth noting that use of the implicit association test as a measurement tool to quantitatively assess changes in individual's unconscious biases or the outcomes of curricular interventions is not recommended because unconscious bias has been determined to be malleable and changes over time as social knowledge and experiences change [37, 38]. A complete summary of the studies included in this review can be found in Appendix B.

Dissertation Aims

As this review has demonstrated, the findings across these two branches of the unconscious bias literature are highly variable and remain inconclusive. As with any quality or performance improvement intervention in primary care, there exists a need for research that examines the contextual factors (i.e. individual characteristics, practice dynamics and or community/organizational culture) that potentially contribute to or can

be leveraged to disrupt unconscious bias [39, 40]. This research should be comprehensive, using both qualitative and quantitative methods in an iterative process as suggested by the literature, however, qualitative methods are largely underutilized in examinations of unconscious bias [41-43]. While many opportunities exist for future research to address some of the weaknesses and gaps previously highlighted by others, this dissertation aims to prioritize the following while making a contribution to the current literature.

First, the unconscious biases of the health workforce are not well understood and need to be examined to better assess their potential associations to patient care. As implicit associations are known to be constructed based on social knowledge and experiences, it warrants that variations may potentially exist. These variations may also be contributing to the variable outcomes observed across the current literature. Once evaluated, these findings could be leveraged in a way that leads to a more definitive conclusion regarding their influence on patient outcomes and or more robust interventions. Second, in addition to individual factors, there are also potentially practice and community factors associated with individuals' decisions to participate in certain unconscious bias reduction activities that are not well known. If so, this potentially presents an opportunity to develop interventions that disrupt unconscious bias at the organizational and or community levels in addition to those focused on modifying individual behaviors. Lastly, given the complexity of unconscious bias, it warrants further examination and exploration outside of the two approaches discussed in the review above. This necessitates applying qualitative methods to the study of

unconscious bias within the target population to generate hypothesis for future research that moves the field closer to its aim of reducing disparities in healthcare delivery.

Chapter 3 - Differentiating the Unconscious Racial Biases and Attitudes of Physicians, Nurses, and the Public: Implications for Future Healthcare Education and Practice

Studies have demonstrated that the unconscious biases of healthcare professionals are a contributor to racial healthcare disparities as they modify clinicians decisions regarding care access and quality [27, 44, 45]. Much of the evidence used to support this conclusion has been generated using mostly primary care physicians as study participants (Appendix A) [27-29]. While some studies have included other types of clinicians and or medical specialties, seldom if ever are those results stratified to allow for comparisons between groups. However, a 2016 market survey by Medscape found that physicians in primary care specialties reported fewer biases towards patients than those in emergency medicine and psychiatry (62% and 48%, respectively) [46]. In addition, it's also been suggested that pediatricians may hold fewer biases towards patients than any other specialty due characteristics associated with their training and experiences working specifically with children [47].

Whereas the unconscious biases of physicians and providers as a whole have been thoroughly examined, little is known about the unconscious biases of nurses independent from other provider types. Wherein they are described in the literature the focus is mostly didactic, only providing frameworks and strategies to mitigate the effects of unconscious bias in nursing education and practice [48-53]. Advanced practice nurses are increasingly providing holistic patient centered care that requires them to make care decisions and treatment recommendations to prevent and manages complex biopsychosocial issues independent of physician oversight [54-57]. These decisions are also subject to influence from unconscious bias, which justifies the need to examine nurses as thoroughly as physicians to infer their potential contribution to health care disparities

This study aims to make a contribution to literature by examining and distinguishing the implicit associations and attitudes of physicians and nurses in reference to one another and the general public. According to the primary care performance improvement literature, understanding the contextual factors of an intervention, such as individuals' attitudes towards it, are necessary as they are likely to moderate behaviors associated with effectiveness [39, 40]. Previous studies comparing the unconscious biases of primary care providers to the local community found no substantial differences and suggested bias should be considered more of a societal issue and less as a healthcare issue [8]. If so, that would then suggest that even when stratified by type of provider, the unconscious biases of healthcare professionals are the same as those of the general public and shaped by the same social knowledge and experiences. However, different outcomes for healthcare professionals would indicate that the unconscious biases of healthcare professionals are mediated by additional differential knowledge and experiences encountered throughout medical education, training, and practice, which may require alternative interventions.

Conceptual Framework

This study presents a theory of change framework conceptualizing how unconscious bias results in disparate healthcare outcomes for patients and opportunities to disrupt it (Figure 2). The academic medical literature includes numerous studies examining interventions for disrupting the formation and effects of unconscious bias in healthcare settings [37, 38, 58-61]. Type A interventions are designed to disrupt the activation of stereotypes individuals form based on knowledge and experiences gained from their environments in relation to their social identities.

However, once activated, Type B interventions aim to counteract these associations and replace them with new more positive ones that reposition individual attitudes and beliefs. Lastly, Type C interventions are intended to interrupt behaviors strongly associated with unconsciously biased beliefs before they result in judgments and or actions that result in disparate outcomes for certain groups of patients. The effectiveness of Type A and B interventions are often measured quantitatively using pre and post assessments examining changes in individuals' IAT scores and qualitatively using surveys that examine attitudes and beliefs [60, 62-64]. There are not yet any studies examining the effectiveness of Type C interventions in healthcare settings with clinicians and patients.

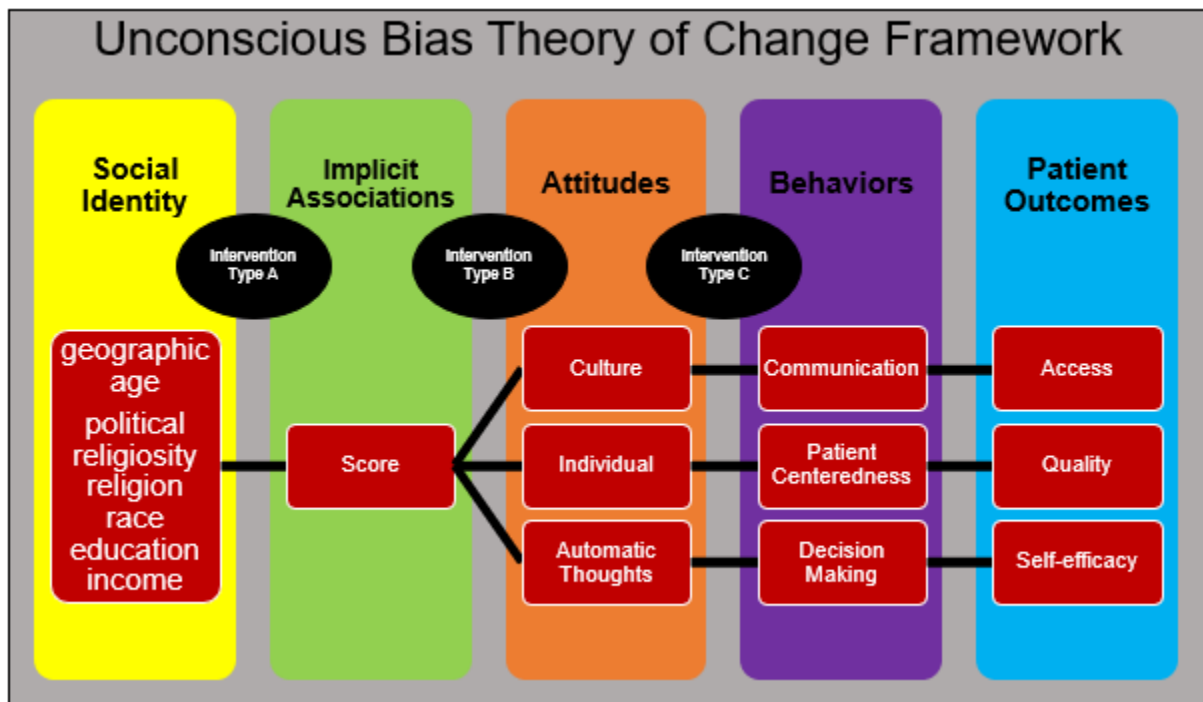


Figure 1 Unconscious bias theory of change framework for healthcare

Methods

Data from this study comes from Harvard's Project Implicit, the most widely used and well validated measure of implicit associations [65]. Through the Project Implicit

demonstration website IAT data has been collected from millions of voluntary respondents across the globe for nearly two decades. Based upon data from the 2010 Census, Project Implicit respondents tend to be younger (median = 38.1 versus 23.0 years), female (49.8% versus 59.4%) and reflect the racial demographics of the regions in which participants are located [66]. This study examines data from two samples of respondents to the Race IAT from 2015 to 2019. Sample 1 includes respondents categorized by age, geographical location, political affiliation, religious identity, education, and income while Sample 2 is limited to a subset of respondents categorized by occupation and geographic location only (Table 6).

Occupation data is available by 65 occupational categories, which includes five categories for healthcare. As this study is specifically interested only in those healthcare occupations that provide diagnostic and treatment recommendations, the occupation variable was recoded to specify a) medical doctors, b) nurses and c) all other occupations, which included for example occupational therapist, lab techs and home health aides as part of the general public. It is important to note that a limitation of this occupational data is that it does not specify the different types or levels of training among medical (i.e. MD vs DO) and nursing (i.e., LPN, RN, etc.) respondents. There are differences in scope of practice between registered nurses and licensed practical nurses and education between BSN-prepared nurses and ADN-prepared nurses. Likewise, the philosophy of care amongst Doctor of Osteopathic Medicine differ significantly from those trained in allopathic medicine. It is unclear at this time the potential impact these differences may have on their unconscious biases but may present an opportunity for future research. Occupation information was only collected

for a subset of participants that were not also asked the personal identify questions listed below. Analysis is conducted separately for these two groups. **Age** data capture respondent's year of birth which has been recoded to one of six generational categories: The Greatest (1910-1924), the Silent (1925-1945), Boomers (1946-1964), Generation X (1965-1979), Millennials (1980-1994) and Generation Z (1995-2012).

Geographical locations are captured by state. Previous research has demonstrated that the unconscious biases of whites towards Blacks aggregated at the county and state level are higher in the southeast and are also strongly correlated with disparities in mortality, birth outcomes, police brutality and Medicaid spending and vary by region [67]. As suggested, if unconscious bias is a societal issue then this regional variation should also be consistent among healthcare professionals and reflected in their perceptions overall. Regional variation of unconscious bias among healthcare professionals has not been examined in the literature which presents an opportunity for future research evaluating its correlation to health outcomes at a macro-level that may be considered in regional disparity reduction initiatives should evidence continue to suggest unconscious bias is indeed a healthcare issue. The geographical data captured is recoded to one of six cultural regions based on aggregated attitudes and beliefs: Caribbean, Frontier, Northeast, Midwest, Pacific and South (Table 5) [48].

Political Affiliation is measured using a seven-point scale ranging from strongly conservative to strongly liberal and uses neutral as a reference. **Religiosity** is measured using a four-point scale ranging from not at all (reference) to strongly religious. **Religious identify** captures five of the major global faith traditions to include Buddhist, Christian (Catholic and Protestant), Hindu, Jewish and Muslim using no

religion as a reference. **Education** captures 14 different types to include specific degrees and uses high school as a reference. Finally, **income** is measured in increments of \$10,000 per year ranging up to more than \$200k per year. As a reference, \$70,00 was used as the median annual U.S. income based on data from the U.S. Census.

Table 1 Summary of states and territories categorized by region and occupation

Region	States and Territories	Physicians (n=1128)	Nurses (n=1462)
Caribbean	American Samoa, Micronesia, Guam, Marshall Islands, Northern Mariana Islands, Puerto Rico, Palau, Virgin Islands	0	1
Frontier	Arizona, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah, Wyoming	112	164
Northeast	Connecticut, Delaware, District of Columbia, Maine, Massachusetts, Maryland, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont	258	241
Midwest	Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, Wisconsin	307	613
Pacific	Alaska, California, Hawaii, Oregon, Washington	192	249
South	Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, West Virginia	259	194

The outcomes of interest in this study are the IAT D-score and attitudes. Implicit associations are measured using a D score that has a theoretical range of -2 to +2 [68]. Respondents with a D-score equal to 0 ($\pm .15$) demonstrate no preference for either

white or Black individuals, whereas more positive scores suggest a 'slight' (.15<), 'moderate' (.35<) or 'strong' (.65<) preference for whites. To measure attitudes, survey participants were asked to reflect on the exercise using three statements to indicate their level of acceptance or disregard of their IAT results. It's been suggested that individuals who express agreement with and acceptance of these statements are able to quickly process and understand their negative implicit associations and move towards actions that dismantle them [46-48]. This may provide some insight as to healthcare professionals intentions to take actions that address their unconscious biases. The statements are measured using a four-point Likert scale from "strongly disagree" (-2) to "strongly agree" (+2) which was recoded into a binary variable of "disagree" or "agree". The questions statements include:

- a. My IAT score reflects the culture that I am exposed to, but not me, personally
- b. Whether I like my IAT score or not, it captures something important about me
- c. The IAT reflects something about my automatic thoughts and feelings concerning this topic

Analysis includes a summary of each of the described measures (Table 6) followed by bivariate analysis (Tables 7 and 8) and multivariate linear regression (Table 10). A two-sample t-test was conducted to test the null hypotheses that there are no differences in either overall IAT D-scores or attitudes towards unconscious bias between a) physicians and nurses, b) physicians and the general public or c) nurses and the general public. Each bivariate analysis also includes an examination by region to detect geographical differences that may be compared to previous research. Lastly, correlation analysis (Table 9) followed by multivariate linear regressions were conducted using Sample 2 to examine the strength of the association between the

explanatory and dependent variables and to model the likelihood that an individuals' social identify could predict their IAT score as described in the conceptual framework provided in Figure 2.

Results

Study respondents were well distributed across each region except the Caribbean, which did not include any physicians and therefore was excluded from further comparative geographical analysis. The greatest proportion of respondents in Sample 1 were individuals from the Midwest, those in the Millennials age group, those who possessed bachelor's degrees and those with an annual income between \$20-\$30k. The majority of respondents held no specific political or religious beliefs which reflects national trends [69]. While physicians and nurses make up less than 0.5% of total survey respondents (n=678,196) they represent approximately 3% of the respondents who identified their occupation. Overall, IAT D-scores indicate a slight preference for whites among all respondents (M=.2817, SD =.44). Healthcare professionals IAT scores were higher than the general public where nurses showed a slightly greater preference for whites than physicians (.3331 and .3293, respectively). The majority of respondents tend to agree that the IAT is more an indicator of themselves as individuals, reflecting their automatic thoughts and feelings as opposed to a reflection of their culture which may indicate acknowledgement and acceptance that could lead some respondents to take further action to address their existing biases.

Table 2 Summary of Harvard RACE IAT measures

Demographics			
Variable	Category	N	%
Age Group	Greatest	1,848	.07
	Silent	10,754	.38
	Boomer	174,230	6.19
	Gen X	399,640	14.20
	Millennials	1,146,896	40.76
	Gen Z	1,080,113	38.39
Political Identity	Strongly Conservative	90,130	3.10
	Moderately Conservative	253,717	8.73
	Slightly Conservative	237,347	8.17
	Neutral	803,571	27.65
	Slightly Liberal	316,735	10.90
	Moderately Liberal	741,864	25.53
	Strongly Liberal	462,564	15.92
Religiosity	Not at all religious	1,070,433	36.55
	Slightly Religious	855,654	29.21
	Moderately Religious	698,562	23.85
	Strongly Religious	304,226	10.39
Religion	No religion	1,078,835	37.75
	Buddhist	42,681	1.49
	Catholic	646,679	22.63
	Protestant	788,305	27.59
	Hindu	33,117	1.16
	Jewish	80,604	2.82
	Muslim/Islamic	57,396	2.01
	Other	129,966	4.55
Education	High School	20,009	7.42
	Some College	29,716	11.02
	Associates	11,017	4.08
	Bachelor's	82,715	30.66
	Some graduate school	11,389	4.22
	Master's	60,502	22.42
	Juris Doctorate	11,921	4.42
	Medical Doctor	4,822	1.79
	Doctor of Philosophy	16,130	5.98
	M.B.A.	7,238	2.68
	Other advanced Degree	3,840	1.42
	Occupation	Physician	1,317
Nursing		1,621	0.24
General Public		73,127	10.78
Income	More than \$200k	14,483	4.60
	<\$200k	3,203	1.02
	<\$190k	1,202	.38
	<\$180k	2,059	.65
	<\$170k	1,801	.57
	<\$160k	2,709	.86
	<\$150k	5,185	1.65
	<\$140k	3,522	1.12
	<\$130k	4,808	1.53
	<\$120k	7,157	2.27
	<\$110k	8,379	2.66
	<\$100k	13,302	4.22

	<\$90k	11,783	3.74
	<\$80k	16,686	5.30
	<\$70k	20,438	6.49
	<\$60k	27,101	8.60
	<\$50k	32,419	10.29
	<\$40k	32,992	10.47
	<\$30k	36,251	11.51
	<\$20k	34,086	10.82
	<\$10k	35,421	11.25
Regions	Pacific	406,309	19.55
	Caribbean	1,342	0.06
	Midwest	502,886	24.20
	Northeast	452,206	21.76
	South	406,219	19.55
	Frontier	308,107	14.83
Overall IAT D- Scores			
Occupation	Mean (Std Dev)	Min	Max
Physicians	.3293 (.45)	-1.25	1.43
Nurses	.3331 (.44)	-1.29	1.47
General Public	.2946 (.45)	-1.76	1.64
Unconscious Bias Perceptions N (%)			
Question	Disagree	Agree	
My IAT score reflects the culture that I am exposed to, but not me, personally.	191,438 (40.44)	281,981 (59.56)	
Whether I like my IAT score or not, it captures something important about me.	107,021 (22.36)	371,578 (77.64)	
The IAT reflects something about my automatic thoughts and feelings concerning this topic.	117,444 (24.54)	361,049 (75.46)	

While analysis could find no difference between the overall IAT scores of physicians (M=.329, SD=.45) and nurses (M=.333, SD=.43), each was greater than the general public (M=.295, SD=.45), $p < .005$. When examined by region, results show that physicians' IAT scores were greater than each of the other groups in the South (M=.3437, SD=.47) and greater than the general public in the Northeast (M=.3607, SD=.45). Nurses IAT scores were greater than any other group in the Midwest (M=.4039, SD=.40) and in the Frontier (M=.3756, SD=.42).

Table 3 Mean Harvard Race IAT D-Scores by occupation and region

	Nationwide	Pacific	Midwest	Frontier	South	Northeast
Physician	.3293 [^]	.2763	.3333 [*]	.3257	.3437 ^{*^}	.3607 [^]
Nurses	.3331 [^]	.2538	.4039 [^]	.3756 [^]	.2656	.2976
Gen Public	.2946	.2754	.3089	.3066	.2862	.2947
p-value < .05 [*] as compared to nurses and [^] as compared to the general public						

Upon examining attitudes towards unconscious bias, results show that among nurses there is greater agreement than among any other group that unconscious bias is a reflection of one's culture (M=.2658, SD=.96) and less an indication of individualistic or automatic thoughts towards people of another race. Physicians' attitudes (M=.4806, SD=.87) were more similar to that of the general public (M=.5039, SD=.86) and reflected the opposite perspective. This observation is consistent across each region except for in the South where agreement among nurses is highest that unconscious biases are more the result of individuals' own thoughts and feelings (M=.5206, SD=.86) than a reflection of the culture (M=.2727, SD=.96).

Table 4 Unconscious bias attitudes by occupation and region

My IAT score reflects the culture that I am exposed to, but not me, personally.						
	Nationwide	Pacific	Midwest	Frontier	South	Northeast
Physician	.0428 ^{*^}	-.2126 ^{*^}	.1160 [*]	0 ^{*^}	.1839	0
Nurses	.2658 [^]	.2777 [^]	.3209 [^]	.3118	.2727	.1141
Gen Public	.1556	.1113	.1962	.1865	.1670	.1311
Whether I like my IAT score or not, it captures something important about me.						
	Nationwide	Pacific	Midwest	Frontier	South	Northeast
Physician	.4806	.5905	.4696	.5211	.2686 ^{*^}	.6058
Nurses	.4554 [^]	.5104	.4087 [^]	.4408	.5372	.4666
Gen Public	.5039	.5363	.5297	.4771	.4711	.5061
The IAT reflects something about my automatic thoughts and feelings concerning this topic.						
	Nationwide	Pacific	Midwest	Frontier	South	Northeast

Physician	.4799*	.5312	.6555*^	.3714	.1771*^	.6115*^
Nurses	.3932^	.5	.3410^	.2688^	.5206	.4324
Gen Public	.4663	.4867	.4852	.4418	.4441	.4665
p-value < .05 *as compared to nurses and ^ as compared to the general public						

Correlation analysis identifies weak yet statistically significant associations between many of the explanatory and outcome variables. The highest correlations were between IAT Scores and attitudes that unconscious biases reflect one's culture ($r=.2477$) followed by political identity and that biases reflect individuals ($r=.1550$). Multivariate linear regression analysis was used to test if social identity significantly predicted respondents IAT scores. The results indicated that the model explained 2% of the variance ($R^2=.0215$, $F(59,107242)=39.77$, $p<.001$) where individuals who identified as strongly conservative showed a greater preference for whites ($\beta=.14$, $p<.001$), as did those with annual incomes between \$90-\$100k ($\beta=.0195$, $p=.01$). Across regions, the Midwest was most similar to the South ($\beta=.0041$, $p=.332$). Preference for whites declines significantly among younger generations, those who express more liberal political identities and stronger religious beliefs ($p<.001$). Preferences for whites was also lowest among those of Muslim and Protestant faith traditions ($p<.001$). Preference for whites declined with increasing levels of education beyond high school, except for those with medical degrees ($\beta= -.0072$, $p=.569$). Preference for whites increased significantly up to an annual salary of \$30k ($p<.001$) then varied.

Table 5 Correlation analysis of Harvard Race IAT explanatory and outcome variables

Variable	IAT Score	Culture	Individual	Thoughts
IAT Score		.2477*	-.0702*	-.0717*
Region	.0102*	.0108*	.0009	-.0023

Age	-.0242*	.0391*	-.0104*	-.0139*
Political	-.0915*	-.0345*	.1550*	.1380*
Religiosity	-.0210*	.0074*	-.0251*	-.0342*
Religion	-.0200*	-.0341*	.0314*	.0398*
Education	-.0098*	-.0506*	.0486*	.0523*
Income	-.0390*	.0471*	.0015	-.0078*

Table 6 Multivariate linear regression modeling effects of social identity on IAT scores

R2=.0215, F(59,107242)=39.77, p<.001)						
Category	Variables	Coefficient	Std. Err	p-value	95% Confidence Interval	
Regions	Pacific	-.0198	.0043	<.001	-.0284	-.0113
	Frontier	-.0107	.0048	.027	.0203	-.0012
	Northeast	-.0266	.0046	<.001	-.0357	-.0174
	Midwest	.0041	.0042	.332	-.0042	.0125
	South	Ref				
Age Group	Greatest	.1099	.1078	.308	-.1013508	.3211871
	Silent	.1334	.0127	<.001	.108415	.1584254
	Boomers	Ref				
	Gen X	-.0423	.0041	<.001	-.050379	-.0343349
	Millennials	-.0172	.0042	<.001	-.0255649	.0088285
	Gen Z	-.1216	.0317	<.001	-.1838709	-.0593829
Political Id	Strg Cons	.147578	.01003	<.001	.1279193	.1672367
	Mod Cons	.1141	.0063	<.001	.1018036	.1264756
	Slight Cons	.0573	.0063	<.001	.0449904	.0696241
	Neutral	Ref				
	Slight Lib	.0125	.0057	.03	.0012206	.0237032
	Mod Lib	-.0206	.0047	<.001	-.0298623	-.0114205
	Strg Lib	-.0646	.0050	<.001	-.0745034	-.0547046
Religiosity	Not at all	Ref				
	Slightly	-.0215	.0045	<.001	-.0304032	-.0126438
	Moderately	-.0536	.0055	<.001	-.0645076	-.0428654
	Strongly	-.0860	.0065	<.001	-.0988633	-.0731821
Religion	None	Ref				
	Buddhist	.0250	.0116	.031	.002341	.047703
	Catholic	.0322	.0054	<.001	.0215336	.0429083
	Protestant	-.0179	.0052	.001	-.0281809	-.0077803
	Hindu	.0124	.0178	.485	-.0225054	.0474234
	Jewish	.0801	.0077	<.001	.0649006	.0952219
	Muslim	-.1333	.0202	<.001	-.1729908	-.0937552
	Other	-.0359	.0080	<.001	-.0517429	-.0202298
Education	High School	Ref				
	Some college	-.0389	.0092	<.001	-.057014	-.0208677
	Associates	-.0171	.0107	.112	-.0381643	.0039939
	Bachelor's	-.0237	.0085	.006	-.0405745	-.0069291
	Some Grad	-.0402	.0107	<.001	-.0611389	-.0191916
	Master's	-.0398	.0088	<.001	-.0571643	-.0225284
	JD	-.0372	.0103	<.001	-.0575827	-.016874
	MD	-.0072	.0126	.569	-.0319166	.0175577
	PhD	-.0391	.0101	<.001	-.0589845	-.0192166
	Other adv	-.0293	.0147	.047	-.0581753	-.0004329
MBA	-.0470	.0117	<.001	-.0699215	-.024144	

Income	More than \$200k	.0235	.0075	.002	.0088	.03825
	<\$200k	.0208	.0134	.120	-.0054	.0471
	<\$190k	.0346	.0188	.065	-.0022	.0715
	<\$180k	.0093	.0152	.540	-.0204	.0390
	<\$170k	-.0298	.0155	.055	-.0603	.0006
	<\$160k	-.0085	.0133	.523	-.0345	.0175
	<\$150k	.0099	.0105	.342	-.0106	.0305
	<\$140k	.0062	.0116	.593	-.0166	.0289
	<\$130k	.0059	.0103	.562	-.0142	.0262
	<\$120k	.0110	.0091	.226	-.0068	.0288
	<\$110k	-.0039	.0087	.652	-.0210	.0131
	<\$100k	.0195	.0076	.010	.0047	.0345
	<\$90k	.0077	.0077	.318	-.0075	.0229
	<\$80k	-.0169	.0071	.017	-.0308	-.0029
	<\$70k	Ref				
	<\$60k	-.0019	.0064	.759	-.0145	.0105
	<\$50k	-.0170	.0063	.007	-.0293	-.005
	<\$40k	-.0117	.0066	.076	-.0246	.0012
	<\$30k	-.0290	.0072	<.001	-.0432	-.0149
	<\$20k	-.0337	.0084	<.001	-.0502	-.0172
	<\$10k	-.0605	.0121	<.001	-.0842	-.0367
	_cons	.3665	.0109	<.001	.3450	.3880

Discussion

This study identified that the unconscious biases of physicians and nurses and their attitudes towards them differ from the public and in some instances from one another. Healthcare professionals were found to have a greater preference for whites than the general public. This is contrary to previous work conducted in Colorado, a Frontier state, which found no differences between primary care providers and the general public. However, a limitation of that study was that it did not examine differences by type of provider and as such was unable to detect the differences identified by this study to support the conclusion made that unconscious bias is a societal issue more so than a healthcare issue. A 2018 study conducted with 107 staff members of the Alabama based Primary Care Research Coalition also examined differences in implicit associations by healthcare occupation and race [70]. In this study, medical doctors/registered nurses were compared to non-MD/RN staff (i.e.

receptionist, etc.) Unlike the findings reported in this dissertation, where physicians (.3437) in this region had statistically significantly higher D-scores than either nurses (.2656) or the general public (.2862), the Alabama study found that D-scores were higher among non-MD/RN staff (0.51) as compared to MD/RN staff (0.4). Of the 107 subjects, only 22 possessed either an MD or an RN, indicating the study didn't include a large enough sample size which limited their ability to examine differences within the clinical group. While no studies were found examining differences between occupations in other fields (i.e. judges vs police or teachers vs administrators), the RACE IAT data set includes both sets of occupations whereas further research could identify if differences exist.

A review of the literature could find no studies evaluating changes in the magnitude of the D-score or potential implications of such differences outside of the theoretically significant effects of 'slight' (.15), 'moderate' (.35) and 'strong' (.65). However, one study did determine that the confidence intervals for the D-score can be very large, spanning a range of up to 0.76 points in some instances [71]. This suggest that an individual with a D-score of 0.4 (moderate) would potentially have a confidence interval ranging from -0.36 (moderate preference for Blacks) up to 1.16 (strong preference for whites). For this reason, the use of the IAT as a tool to measure the effectiveness of interventions is discouraged.

The findings of this study also demonstrate that in some regions, the unconscious biases of nurses show a greater preference for whites which may be of even greater concern than those of physicians, especially in areas where nurses have full practice authority. For the most part, physicians and nurses responded equally

(Table1), except in the Midwest, where responses from nurses were nearly double that of physicians (n=613 and n=307, respectively). Also, preferences towards whites were highest among nurses in the Midwest region. This could be interpreted to suggest that nurses outnumber physicians in this region, indicating that they should be prioritized in research and interventions to address unconscious bias in an effort to reduce healthcare disparities. However, this study found that nurses' perceived their unconscious biases as a reflection of the cultures to which they are exposed and less as a reflection of their own explicit or implicit thoughts and feelings regarding race. This may suggest that nurses are less inclined than physicians to participate in unconscious bias interventions targeting individuals and are more likely to support those addressing practice and workplace culture. Overall, these observed differences between physicians and nurses may just reflect personal and professional character differences (i.e. elitism, empathy, etc.) previously described in the literature. For example, in a comparison study of empathy among female nurses and physicians, nurses scored higher on 15 out of 20 indicators [64]. Increasing empathy has been described as one method of mitigating unconscious bias which would explain why nurses would have lower IAT scores than physicians [43, 65, 66].

This study also examined the magnitude to which measures of individuals' social identity were associated with their level of racial preference and found that it predicts less than 2% of the variance in the analytical model, suggesting greater influence comes from other and perhaps still unknown factors. Identifying these will be critical to developing effective interventions. One area of investigation to start would be to examine the contextual factors associated with our healthcare and medical education

systems that may either introduce or reinforce individuals' existing unconscious bias. An interesting finding from this analysis was that while white preference declined with increasing educational attainment, among individuals with medical doctor degrees, preference for whites remained similar to those with only a high school diploma. One value of higher education is that it brings individuals into contact with culturally diverse and inclusive learning communities in which the stereotypes and biases that contribute to the formation of implicit associations can be counteracted in university settings. The finding that those with medical degrees are no different than those with high school diplomas suggest that somewhere along the medical education continuum, those positive effects are either lost or other more negative influences are reinforced. This conclusion has been supported by previous research demonstrating medical students false beliefs about race and experiences with racism in medical school [14, 20-22]. Minimizing the influence of unconscious bias to produce disparate healthcare outcomes necessitates moving beyond individual and interpersonal factors upstream to identify and address systemic issues within education and practice. Emerging literature has begun to describe how medical education and healthcare are rooted in systemic and oppressive ideologies, such as white patriarchal supremacy, that introduce and or reinforce students and practitioners explicit and implicit biases, stereotypes and misbeliefs [21, 22, 72-74]. Some factors that have already been identified include the poor modeling of patient interactions by faculty, the practice of inferring biological/genetic racial differences in research and the use of unfounded race correction factors in clinical guidelines. This concept is depicted in the framework below (Figure 3). Currently, unconscious bias training targeting individuals has been the only

tool available to address the downstream effects of systematic racism however new resources are emerging in the context of methodologies to address race-based medicine and healthcare operations using principles of critical race theory [10, 11, 75-78].

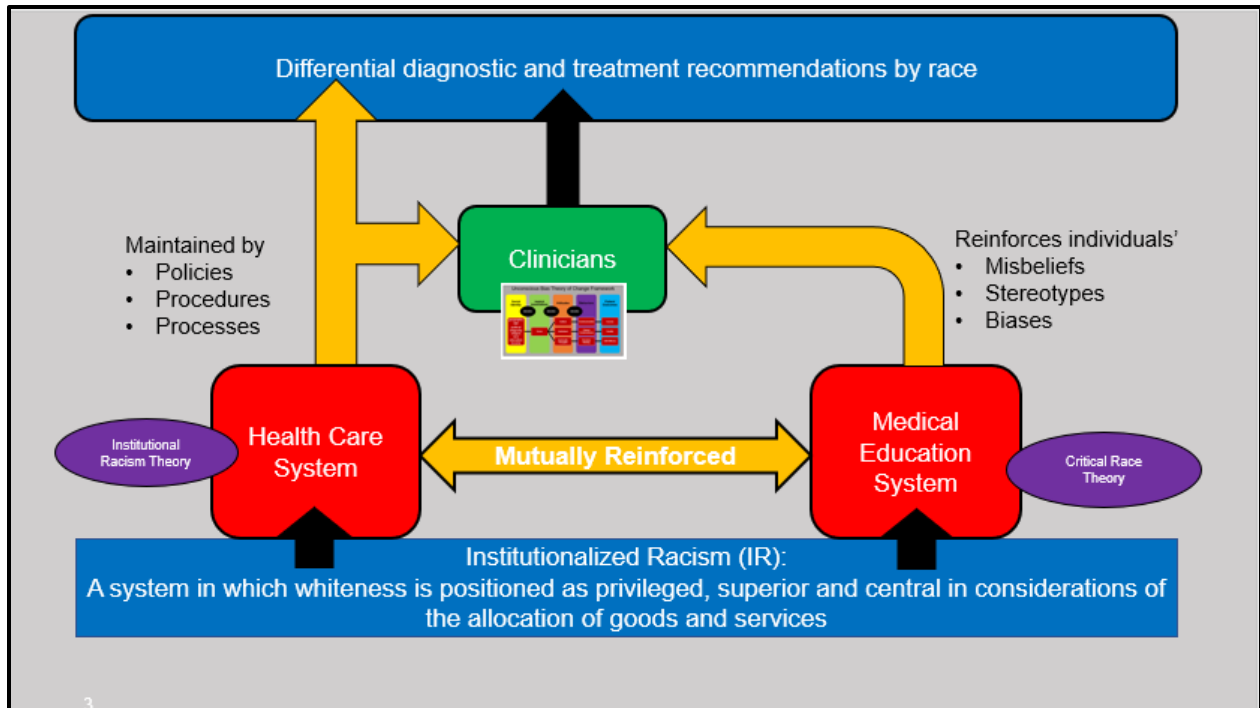


Figure 2 Conceptual framework depicting how institutionalized racism reinforces the biases, stereotypes, and misbeliefs of clinicians

Conclusion

Unconscious biases are determined only minimally by measures of individuals' positioning with social hierarchies suggesting that other more influential factors need to be identified and addressed. In healthcare, the unconscious biases of physicians and nurses differ significantly from those of the general public and show regional variation in areas where nurses have greater preference for whites. However, greater emphasis needs to be placed on identifying and addressing factors associated with medical education and or healthcare delivery that may introduce and or potentiate individuals'

unconscious biases. Interventions are emerging that go beyond addressing individual attitudes and behaviors and refocus on system and institutional level interventions to reduce healthcare disparities.

**Chapter 4 - The Personal, Practice and Community Characteristics of
Family Medicine Physicians Engaged in Unconscious Bias Mitigation
Activities**

Previous research has demonstrated that the unconscious biases of healthcare professionals differ from those held by the general public and in some instances also differ based on type of clinicians by geography [79]. The neuropsychological research suggest that these implicit associations develop from individuals' social knowledge and experiences formed through the lens of their intersecting identities [80-82]. However, when evaluating the contribution of measures of social identity, such as age, political affiliation, religious identity, education, and income, as potential drivers of unconscious biases, they are found to contribute only minimally, suggesting that alternative previous unknown driving factors may exist, especially for healthcare professionals [79]. In addition, little is known about what factors drive healthcare professionals to participate in unconscious bias mitigation activities, such as self-assessments and training. To date, participation in these activities have been primarily voluntary as there are no mandated licensure or certification requirements, even though it may be "highly encouraged" by employers, professional societies or others. This presents a potential challenge to studies designed to examine the effectiveness of unconscious bias training programs as it introduces a great deal of selection bias and or other limitations that may significantly skew evaluation results.

The primary care quality or performance improvement literature emphasizes the need to identify contextual factors to interventions. Contextual factors are those characteristics and circumstances that are not part of an intervention but likely to interact, influence, modify, facilitate or constrain an intervention which can determine its effectiveness [40]. In primary care, these contextual factors are categorized into three areas; organizational, team and individual [39]. For example, individual-level factors

include clinicians' and administrative staffs' beliefs regarding the intervention's value, motivations to adopt new behaviors as well as their own knowledge, skills, and self-efficacy. Failure to acknowledge or address these factors during the development and or implementation of an intervention potentially creates barriers to increasing awareness, knowledge, and acceptance of it [39]. This study aims to examine contextual factors associated with physician participation in unconscious bias reduction activities. This makes a contribution to the literature by providing some insight into who within the physician workforce is actually participating in unconscious bias training which has implications for patient care. In addition, the findings have potential use in the development of more effective interventions and organizational strategies. While the design and frameworks used to guide the development and implementation of current unconscious bias interventions in healthcare target mostly individual characteristics (i.e. empathy, social identity, privilege, etc.) this study intends to also examine factors associated with physician practices and communities, areas not yet considered in the unconscious bias literature.

Conceptual Framework

A conceptual framework outlining personal, practice and community drivers associated with unconscious bias activities, such as self-assessment and training is presented below (Figure 1). First, this study examines the impact of personal factors such as gender identity, age and years since residency which provides an opportunity to demonstrate whether or not their association to unconscious bias mitigation activities are consistent with previous findings examining their influence on unconscious bias.

However, unlike the previous study, due to data limitations, race/ethnicity data is unavailable for this study.

Years since residency is of particular interest not as a measure of social identity but because it may provide some evidence regarding the impact of changes to medical education and residency training aimed at bringing increased awareness and integration of unconscious bias into curricula to address racial health disparities. While there are no requirements set forth by either the Liaison Committee on Medical Education (LCME) for students or the Accreditation Council for Graduate Medical Education (ACGME) for residents, unconscious bias training has become increasingly embraced by these and other organizations such as the Association of American Medical Colleges (AAMC), the American Academy of Family Physicians (AAFP) and others. As such, curricula in recent years has also evolved to more frequently incorporate unconscious bias than in previous years suggesting that younger physicians may be more familiar with unconscious bias and participate in training interventions at proportions greater than older more established physicians. However, there's likely to be a strong correlation between a physician's age and their years since residency, with the exception of non-traditional students, suggesting that either variable could be used to make inferences regarding curricular impact on unconscious bias mitigation activities.

Practice factors to consider are the type of employer a physician works for and community factors (urban/rural) describing where that practice is located, which together can be used to infer other associations regarding patient demographics, policies, care access, etc. In total, eight categories of practice are described including public vs private, for-profit vs not-for-profit as well as academic and health system

settings. The patient demographics of an urban federally qualified health center (FQHC) will differ drastically from that of a rural sole ownership practice. These differences are likely to influence the types of patients physicians interact with and or the standards set for employment (i.e. training) which may be motivating factors for a physician to self-assess their own biases and or subsequently participate in an unconscious bias training intervention. In addition, the type of practice to which a physician belongs such as public vs private, for-profit vs non-profit, etc. may determine both the availability of this type of training and whether or not it is required for employment.

While the empirical analysis of this conceptual framework intends to focus on direct associations between personal, practice and community factors and unconscious bias mitigation activities, there is recognition that indirect associations, additional factors, and alternative pathways may also exist. There is not yet evidence to support that the factors presented here act independent of one another nor that self-assessment is a required precursor to training. However, this study hypothesizes that implicit association testing is strongly correlated with unconscious bias training attendance, which would correspond to differences in attendance between those who take self-assessment and those who don't. Testing results, especially those contrary to an individual's explicit and or espoused beliefs, may potentially factor into decisions to participate in training. As the research in this area expands in scope, the constructs and pathways of these frameworks will become more refined, resulting in the development of more evidence-based training.

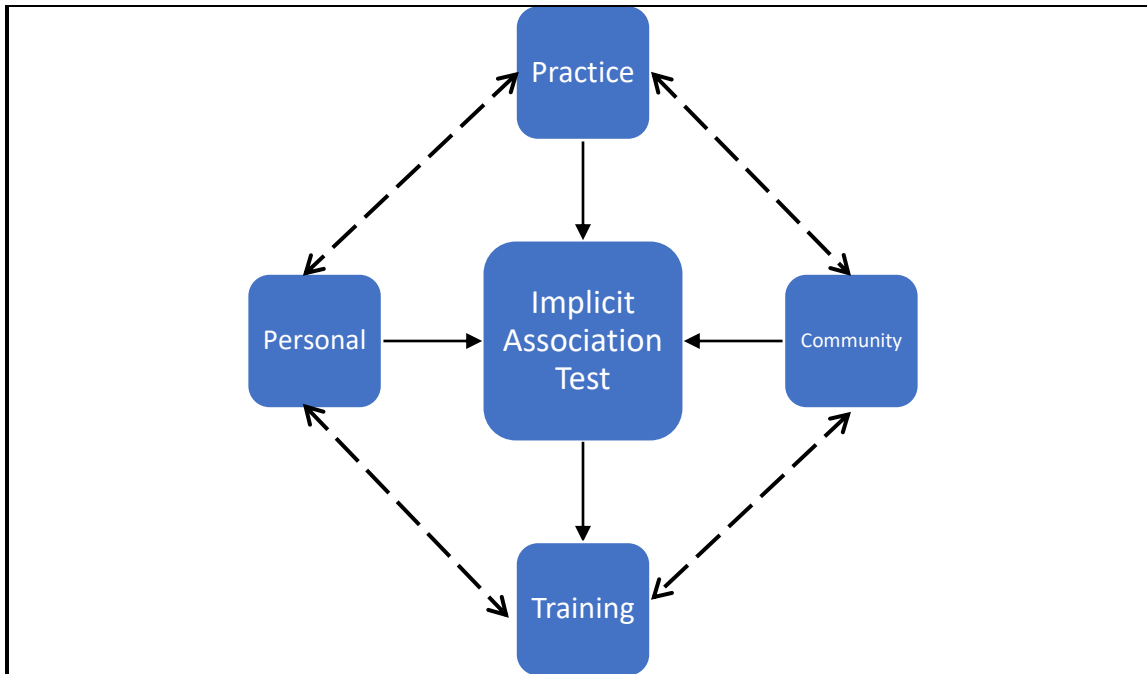


Figure 3 Conceptual framework depicting personal practice and community drivers of unconscious bias assessment and training activities

Methods

To examine the personal characteristics associated with awareness of implicit bias and training activities, this study uses data from a survey (Appendix C) conducted by the American Academy of Family Physicians (AAFP). There are several rationales for surveying this particular medical society. First, it is the largest specialty society dedicated to primary care to which nearly 80% of family physicians belong suggesting a representative sample of all family physicians can be obtained. Second, nearly half of all office visits are to primary care physicians which increases the prevalence and probability that issues of physician biases will emerge in the context of clinical care more so than specialty care which may provide greater motivation to complete an IAT and or attend a training [83]. Survey participants include individuals from a randomized sample of 600 AAFP members who received an invitation to participate via online by

answering questions that explore their familiarity and engagement with unconscious bias assessment and training (Appendix B). While this potentially introduces selection bias as there are likely unknown factors associated with choice of medical specialty and membership in a physician association that may also be associated with who participates in unconscious bias mitigation activities, the sample should be fairly generalizable to the broader membership and specialty as a whole. Demographic variables collected on this sample include the following: gender (male/female), age (categories), community (urban/rural), years since residency (categories) and primary employer (multiple). Years since residency also includes a recoded binary variable to distinguish new physicians, those in practice 7 years or less from more established physicians. Outcome questions of interest include:

- a) How familiar are you with the term “implicit bias”? (categories)
- b) Have you ever participated in implicit bias training? (yes/no)
- c) Have you ever taken an implicit bias test? (yes/no)

Analysis includes a summary of descriptive statistics (Table 1) followed by bivariate analysis. A chi-squared test is used to identify if statistically significant differences exist among the outcome variables (a, b, and c) by gender and setting (urban/rural) across years since residency, new physician status and employer. After which a two-sample t-test was conducted to test the following null hypotheses:

1. There is no difference in outcomes (b) (who takes the IAT) or (c) (who attends an unconscious bias training) between:
 - i. Male and female physicians

- ii. Physicians who practice in either urban or rural settings
- iii. New or older physicians

2.) There is no difference in who attends an unconscious bias training based on having taken the IAT.

Lastly, a correlation analysis between the explanatory and outcome variables followed by logistic regression is conducted modeling a) the likelihood that personal, practice and community factors can predict whether a physician will take the IAT and the b) if those same factors can predict if they will attend an unconscious bias training. The strengths of this study are that it examines new measures of unconscious bias in a well-defined population that allows for broad inferences and generalizations to be made. However, the lack of more detailed and specific characteristics (i.e. practice size, patient demographics, etc.) presents a limitation to drawing conclusions that tie into more direct associations. This presents an opportunity for further research using the findings here to develop more meaningful measures. The reference individual for both models is a female new physician, employed by an urban university, as findings from Harvard's Project Implicit indicate that IAT survey participants are mostly female and younger. Analysis used Stata 15.1 and established statistical significance at 95%.

Results

In total there were 222 respondents to AAFP's online survey which accounts for approximately 37% percent of the randomized sample invited to participate.

Respondents to the survey were predominantly older (75% of AAFP membership) female (46% of AAFP membership) physicians. A greater proportion practiced in urban settings (86.80%) for a private non-profit hospital or health system (25.58%). More than

two-thirds indicated that they were “very familiar” and “have a clear understanding of the term” implicit bias (64.57) however, less than 20% have ever taken the IAT and only a third have ever participated in an unconscious bias training (31.39%). The remainder of the descriptive statistics are provided in Table 1 below.

Table 7 Summary of statistics from the AAFP Implicit Bias Survey

Variable	Label	n	%
Gender	Female	115	51.80
	Male	107	48.20
Years Since Residency	0 to 7	51	22.97
	8 to 14	44	19.82
	15 to 21	50	22.52
	22 or more	77	34.68
Age	30-39	57	25.91
	40-49	67	30.45
	50-59	56	25.45
	60-69	37	16.82
	70 or older	3	1.36
New Physician	Yes	51	22.97
	No	171	77.03
Community	Urban	171	86.80
	Rural	26	13.20
Employer	Federal, state, or local government, (not including universities)	19	8.84
	Physicians group (single- or multi-specialty)	42	19.53
	Self-employed (majority practice owner, independent contractor, etc.)	41	19.07
	Private non-profit hospital or health system	55	25.58
	University-owned (public or private) clinic or hospital	28	13.02
	Private for-profit hospital or health system	12	5.58
	Managed care organization or insurance company	6	2.79
	Other	11	5.12
How familiar are you with the term “implicit bias”?	Not at all familiar, never heard the term before now	13	5.83
	Somewhat familiar, only heard of the term but never had a clear understanding of the meaning	66	29.60
	Very familiar, have clear understanding of the term	144	64.57
Have you ever participated in	No	153	68.61
	Yes	70	31.39

implicit bias training?			
Have you ever taken an implicit bias test?	No	159	81.54
	Yes	36	18.46
Total Sample	N	222	

Chi-squared analysis identified a statistically significant difference in only one area. Older male physicians participated in unconscious bias training at rates greater than expected as compared to newer male physicians (38.64% and 11.11%, respectively). While not statistically significant, physicians 15 to 21 years out of residency took the IAT in greater proportions than expected than any other age group (31.82% $p=.109$). Of the null hypotheses proposed, three were rejected in favor of the alternate. First, urban physicians ($M=.2027$, $SD=.40$) were more likely than rural physicians ($M=.0416$, $SD=.20$) to have taken the IAT ($p=.03$) and second older physicians ($M=.3491$, $SD=.48$) were more likely than new physicians ($M=.2157$, $SD=.41$) to have participated in an unconscious bias training ($p=.04$). Lastly, physicians who had taken the IAT ($M=.8611$, $SD=.35$) were more likely to participate in an unconscious bias training than those who had not ($M=.1761$, $SD=.38$) ($p<.001$).

Correlation analysis outlined in Table 2. identified a (positive) strong and statistically significant association between years since residency and new physician status ($r=.79$ and $p<.001$). Alternatively, a (positive) weak yet statistically significant association was identified between older physicians and participation in unconscious bias training ($r=.15$ and $p=.04$). The strongest (positive) correlation was found between taking the IAT and participation in an unconscious bias training ($r=.54$ and $p<.001$). Lastly, male, or female

gender identity demonstrated a (positive) statistically significant weak association to years since residency ($r=.17$ and $p<.03$).

Table 8 Correlations of variables from the AAFP Implicit Bias Survey

	Participation	Familiarity	IAT	Gender	Years Since Residency	New Physician	Setting
Familiarity	-.0824						
IAT	.5455*	-.0291					
Gender (Male or Female)	.0667	-.0728	-.0708				
Years Since Residency	.1170	-.0671	.0622	.1699*			
New Physician	.1599*	-.0935	.0618	.1105	.7885*		
Setting	-.0069	-.0255	-.1472	-.0074	-.0162	.0130	
Employer	-.1338	.0191	-.0492	-.0510	.0196	.0399	-.2233*

Logistic regression analysis was used to test if personal, practice and community factors can predict participation in implicit association testing (IAT) and training. Though not significant, the following effects were identified. First, practicing in a private non-profit hospital or health system ($OR=.4117$, $p=.207$, 95% CI: .1038, 1.632) or a rural setting ($OR=.17$, $p=.095$, 95% CI: .0217, 1.359) decreased the probability that a physician would take the IAT. Older physicians, specifically those with more than seven years of practice experience showed higher probabilities of participating in unconscious bias training ($OR=2.745$, $p=.060$, 95% CI: .9594, 7.853).

Table 9 Logistic regression model predicting implicit association testing among physicians

Variable	ORs	Std Err	p-value	95% Confidence Interval	
Male	.5673	.2558	.209	.2344	1.372
Older Physicians	1.522	.8331	.442	.5208	4.449
Rural	.1700	.1804	.095	.0217	1.359
Employer					
Federal, state, or local government, (not including universities)	.5029	.4868	.478	.0754	3.353

Physicians group (single- or multi-specialty)	.6500	.4791	.559	.1532	2.756
Self-employed (majority practice owner, independent contractor)	1.285	.8937	.718	.3287	5.022
Private non-profit hospital or health system	.4117	.2893	.207	.1038	1.632
Private for-profit hospital or health system	1.400	1.373	.731	.2051	9.564
Managed care organization or insurance company	.6824	.7215	.521	.0683	2.326
Other	.3223	.4239	.125	.0165	2.221
Years Since Residency					
8 to 14	.9568	.6924	.951	.2317	3.952
15 to 21	2.154	1.397	.237	.6040	7.682
22+	1.455	.9331	.558	.4142	5.113

Table 10 Logistic regression model predicting implicit association training among physicians

Variable	ORs	Std Err	p-value	95% Confidence Interval	
Male	1.159	.3876	.658	.6022	2.233
Older Physicians	2.284	1.005	.061	.9637	5.414
Rural	.7485	.3489	.534	.3003	1.866
Employer					
Federal, state, or local government, (not including universities)	1.400	.9398	.616	.3755	5.218
Physicians group (single- or multi-specialty)	1.054	.6155	.928	.3358	3.311
Self-employed (majority practice owner, independent contractor)	1.504	.8657	.479	.4864	4.647
Private non-profit hospital or health system	.8213	.4471	.718	.2825	2.387
Private for-profit hospital or health system	.2438	.2819	.222	.0253	2.351
Managed care organization or insurance company	.3847	.4590	.423	.0371	3.989
Other	.2546	.2958	.239	.0261	2.483
Years Since Residency					
8 to 14	2.745	1.472	.060	.9594	7.853
15 to 21	2.030	1.061	.175	.7289	5.653
22+	2.233	1.079	.097	.8656	5.758

Discussion

This study aimed to examine the personal, practice and community characteristics that are associated with the unconscious bias mitigation actions of family medicine physicians. Overall, no gender differences were identified, a finding that is consistent with previous work, which suggest that measures of identity have little impact

on individuals' decision to engage in unconscious bias mitigation activities. In total, participants in practice more than 15 years since residency represent a greater proportion of the sample at 57.2% which would include individuals approximately age 46 and older. This estimation assumes a traditional pathway of four years of undergraduate education, four years of medical education and three years of residency training. This study considered that newer physicians would be more likely to participate in unconscious bias training than older more established physicians because of changes to medical education and training in recent years. However, this analysis identified the opposite which may suggest older physicians may be provided with some type of incentive to participate or organizations are prioritizing training for physicians more so than for students and residents. However, the observed difference by age may also reflect differing generational attitudes towards the concept of unconscious bias, an area not yet examined in the research [84]. As expected, analysis indicated that IAT rates were greater among urban physicians as compared to rural physicians which may indicate that physicians practicing in urban settings experience a greater number of interactions with more diverse patient populations that potentially trigger implicit associations that warrant conducting self-assessments and training to address their unconscious biases towards them. However, as national trends show, rural areas are becoming increasingly diverse and as such will need a workforce that can address unconscious bias in order to provide equitable care [85].

Correlation analysis identified a strong association between physician age by category and years since residency, however results demonstrated that being a new physician was strongly associated with all three outcomes and a better fit for the

regression model. In addition, a weak association was identified between gender and years since residency suggesting that perhaps as physicians become more established, the demographic becomes increasingly male, an indication that women may be dropping out of the medical workforce at older ages [86]. As indicated by the logistic regression model, older physicians with more than 8 years of practice experience was the strongest predictor of whether a physician would participate in unconscious bias training. This may indicate that for this particular demographic of physicians, their participation in unconscious bias mitigation activities, which may be highly encouraged by their organizations, could be associated with desires to obtain future leadership roles that necessitate a commitment to advancing health equity and reducing health care disparities.

While the logistic regression includes both qualitative and quantitative effects, for the purposes of this analysis, quantitative interpretations are not overly emphasized due to limitations with the data. For example, the odds that a physician practicing in a rural area will participate in an unconscious bias training decreases by nearly 25 percent as compared to a physician in an urban practice (OR=.745, p=.584). To provide a more meaningful interpretation of the quantitative effects, more specified continuous measures of rural would need to be included in the model, such as population size, population density, etc., in order to demonstrate significant changes in effect size. The lack of significance demonstrates that the current measures lack the necessary precision needed to infer strong conclusions regarding their impact on outcomes. However, it may provide a starting point for further research.

Conclusion

While unconscious bias education is highly encouraged within the specialty of family medicine, physicians' decisions to participate in mitigation activities are likely influenced by their employer. Participation among older physicians, specifically those with more than 8 years of practice experience may potentially be influenced by targeted employer incentives, such as promotions, performance evaluations, etc. however additional research is needed to understand further. Future research in this area should aim to include more specific measures of personal, practice and community factors. While the evidence demonstrating the effectiveness of unconscious bias training to reduce healthcare delivery disparities is still unclear, unconscious bias training has additional value at the organizational level by cultivating a more inclusive and equitable workplace culture within healthcare with implications for clinical training, policies and procedures, which have downstream implications for patient care [72, 73, 78, 87].

**Chapter 5 - An Interpretive Phenomenological Analysis of Family
Medicine Physicians' Perspectives of and Experiences with
Unconscious Bias and Unconscious Bias Training**

It has been suggested that the unconscious biases of health care professionals contribute to healthcare disparities [14, 15, 88-90], a conclusion which has prompted many health care organizations and medical schools to implement training interventions that serve to raise awareness of unconscious bias and teach skills that reduce its influence on clinical decision-making and practice behaviors [4, 91]. However, despite this widespread adoption of unconscious bias training, the evidence supporting its effectiveness still remains unclear [32, 92]. Others have suggested possible legal remedies to address providers' unconscious biases, although there is no indication that these will soon come to pass, however, the mere suggestion of it may be enough to spur organizations to err on the side of caution in the absence of evidence rather than suffer the consequences of inaction [93-95]. The lack of adequate evidence may potentially explain why currently there are no mandates or requirements for unconscious bias training associated with physician licensure, certification, or accreditation, which indicate participation among physicians remains primarily voluntary.

Voluntary participation is a limitation of outcome effectiveness studies on unconscious bias training programs as there's no way to identify or control for the number of potential selection and or confirmation biases that are associated with who participates in these trainings and why. However, previous research has provided some indication that older physicians (those with more than 8 years of practice experience) and the type of employer a physician works for may be associated with their participation in unconscious bias mitigation activities [96]. For example, physicians employed by a federally qualified health center were more likely to indicate they had participated in an unconscious bias training than those in a private for-profit hospital or

health system. It is contextual factors like these (i.e. population demographics, practice settings, participants attitudes, etc.) that have been shown to moderate the effects and implementation of an intervention when not well understood [39, 40]. This gap exists primarily because interventions have been developed and evaluated extensively using subjects from the general population or sometimes students, rather than the populations they are intended for (i.e. practicing physicians).

This study aims to identify and examine contextual factors associated with physicians' perspectives of and participation in unconscious bias training which contributes to the literature in the following ways. First, it examines potential outcomes from unconscious bias training among the population unconscious bias training is intended for, practicing physicians. This is absent from the existing literature. Second, it provides some further indication as to who within the physician workforce is participating in unconscious bias training and additionally why which has implications for the potential impact on patients. Lastly, the findings may potentially lead to the generation of new hypotheses and approaches for future research that result in more innovative interventions beyond those aimed simply at moderating the behaviors of individual physicians to reduce health care disparities.

Methods

Data for this study was collected from focus group interviews conducted with members of the American Academy of Family Physicians (AAFP) and analyzed using a phenomenological approach to identify key themes. The AAFP is the largest medical specialty society dedicated to primary care to which nearly 80% of family physicians belong and primary care physicians provide more than 200 million patient visits annually

[97, 98]. Given their policies and educational offerings on unconscious bias, AAFP members provide a well-defined and knowledgeable target population for this study to which generalizations to other primary care specialties can be inferred. All aspects of the study were approved by the Institutional Review Board of the AAFP (Appendix F).

The benefit of using focus groups as the primary qualitative data source is that it allows the opportunity to observe interactions between participants, which is conducive to the generation of new knowledge [43]. As described by Merton et. al. (1990) focus groups bring several different perspectives into contact; for some, until they've interacted with others on the topic, they are unaware of their own perspectives. Focus groups create the opportunity for this type of interaction which is difficult to obtain using other methods (i.e. individual interviews or participant observation). Also, studies have shown that focus group settings are more likely to generate knowledge regarding sensitive and personal information than individual interviews because of the support and trust provided by peers [99]. Lastly, focus groups have been described elsewhere in the literature as ideal for family medicine physicians because unlike surveys and other questionnaires, focus groups are less time consuming and create an informal atmosphere that rewards them with stimulating debate and discussion [100].

Participants were selected using a purposive sampling strategy based on their responses to an online survey and self-reported demographics (Appendix C and D). Selected participants were sorted into two distinct groups; those who have participated in unconscious bias training within the last year and those who have not to obtain broadly diverse viewpoints from both perspectives to meet study aims. Having separate groups creates a homogeneity that allows for a freer flowing within group discussion

that can be more easily analyzed to identify key differences in perspectives between the two groups. A total of 24 participants were invited for this study to accommodate a potential no-show rate of 20% which resulted in a final group size of 9 participants in each group. Focus groups were conducted in conjunction with the AAFP's annual meeting and participants received incentives in the form of \$150 Visa gift cards.

The focus group guide was developed using a funnel strategy approach which began with a less structured free discussion with open-ended questions such as, "tell us about yourself, where you live, and where you work?" and "When you hear the term 'implicit or unconscious bias' what comes to mind first?" to more structured discussion questions such as "What did you value most from the training?" and "How important do think is it that implicit bias training be included in the medical school training?" (Appendix D). The major domains and elements of the interview guide were developed primarily from the literature on contextual factors of interventions in primary care settings and refined based on the screening survey findings [39, 40]. Both focus groups concluded with asking participants to provide a final summary statement suggesting actions the AAFP should take to communicate the aim and potential outcomes of unconscious bias education and training interventions to members and strategies to motivate participation.

Focus group transcripts were analyzed using an interpretive phenomenological approach (IPA) which is a method that has been identified as ideal for health services research studies using small groups of participants like focus groups [101, 102]. While the purpose of IPA is not to generate new theories regarding a phenomenon, like unconscious bias training, it allows for the identification of key themes that are reflective

of physicians perspectives on and experiences with unconscious bias and unconscious bias trainings that can accessed in the development of further research, which is an aim of this particular study. In accordance with established IPA guidelines developed by Smith et. al, audio and written transcripts were listened to and read multiple times to ensure as the researcher, the content and the context of each participants' account was accurate and a true reflection of their experience [103]. The first analysis served to gain familiarity with the materials, the second to identify and describe themes and the last to verify the accuracy of the second stage of review. Subsequently, themes were then sorted and organized into major and subordinate categories.

The ensure that the analysis met a certain stand of rigor the following steps were taken. First, findings were validated by triangulation to a set of data collected from a previous study examining the personal, practice and community factors associated with physicians participation in unconscious bias mitigation activities [96, 104]. This previous study used a quantitative survey method which also included open-ended responses to which the findings of this qualitative study could be validated for accuracy. In addition, the focus group participants for this study were selected based on their responses to the aforementioned study, indicating that these findings possess a high degree of validity and credibility. Second, to ensure reliability of the findings, a detailed record of decisions made at each stage of analysis was maintained to include personal reflections. Because IPA has been described as “an interpretative process between the researcher and the researched” the researcher must ensure that neither personal biases nor vested interests influence any stage of the research process [102, 105]. Journaling personal reflections during the process allows the researcher to challenge

how their own perceptions and interpretations may influence the findings. No peer reviewers were used during study analysis, a limitation which may have some effect on results. Lastly, this study acknowledges that generalizability of findings is not feasible in IPA studies as participants are selected based on their individualized experiences (i.e. with unconscious bias training) rather than for their ability to represent the perceptions of a larger population [102, 103].

Results

While no self-identified demographic data was collected, study participants were asked to describe themselves, where they live and practice. Urban metropolitan areas were well represented and included cities such as Atlanta, San Francisco, and Chicago. Only one participant described their location, Salem, OH, as “semi-rural/suburban”. The majority of respondents were employed physicians serving in academic roles such as residency faculty (4) or in direct patient care roles such as medical directors (4). Of the two participants who indicated either sole or partial ownership of their practice, one was a direct primary care (DPC) provider. Among those in direct patient care roles, their practice settings included federally qualified health centers, community hospitals (5), government and outpatient clinics. Where indicated, scope of practice included references to sports medicine (1) and women’s health (2), including labor and delivery. Lastly, two participants indicated they were either active or recently retired military physicians and a third indicated they were currently serving as a chief resident.

Analysis identified five major themes. First, personal **resistance to the insinuation of unconscious bias**. Participants in both groups frequently indicated that just discussing the topic initially triggered feelings of defensiveness, discomfort and

vulnerability that led them to reject the notion that they themselves were biased and or question the validity of assessment tools such as the implicit association test. For example, upon first learning about unconscious bias, one participant responded that, *“when I first heard about it and when I asked people about it.....I became very defensive until you start learning about it”*. They also continued to further elaborate on this feeling of defensiveness in discussing it with other individuals. Another described *“multiple levels of vulnerability”* associated with feeling as though as physicians *“we’re supposed to have the insight”* however *“I’m admitting that I’m unable to do anything about it at this point”*. Lastly, discomfort was acknowledged as an important part of the learning process, where in one participant stated, *“because it’s hard to talk about, you have to sort of agree we’re going to be uncomfortable with the topic. We’re all going to have to just assume good intent and be able to say what we want to say”*. These findings are consistent with previous studies examining reactions to unconscious bias among medical students, which indicates a need to create a learning environment that is safe and inclusive for learners at all stages of the medical education continuum prior to engaging in potentially sensitive and emotionally charged discussions which may quickly derail the goals of unconscious bias training [59, 60, 64, 106]. Ultimately, for the group of participants who had never participated in an unconscious bias training, it was for these reasons cited, in addition to the fact that for some, this was their first time encountering the concept.

Despite these initial reactions, there was a consensus between the participants in each group that indicated a desire to be **responsive and proactive to the issue** of unconscious bias, primarily because of personal accounts from those having

experienced unconscious bias firsthand. This responsiveness is often characterized with an acknowledgment of its influence on patients but followed up with a diverse set of perspectives regarding how it should be addressed. First, those who had participated in an unconscious bias training expressed overwhelmingly that unconscious bias training should be required on an annual basis starting in medical school and into continuing medical education. Across both groups there were those who suggested that individual training was insufficient, and some cited the need for interactions engaging members of the community. For example, one participant indicated that to minimize resistance in their residency program, *“we bring in people from the community that talk about what it’s like to be them”* and similarly another indicated that a portion of their curriculum included *“instruction by volunteers from the community”*. This perspective is consistent with literature suggesting that unconscious bias training should incorporate social interactions with what are known as “counter stereotypical exemplars” to increase empathy and obtain a greater awareness from the perspective of others affected by it [32, 37, 107]. Lastly, both groups expressed a desire for greater organizational accountability. Feelings of ineptitude and questions of effectiveness with regards to unconscious bias training were countered in some instances with statements such as *“...individual action is one part of it, but I think the organizations and institutions, that action is more important”*. Likewise, another participant emphasized, *“...it has to be in the culture. It has to be mandatory. You know, lectures are not going to help”*. Both statements suggest that interventions designed to target workplace cultures could potentially play a more significant role in reducing individuals’ unconscious biases. The concept of unconscious bias in an organizational context warrants further examination

to understand how systems, policies and procedures potentially form or reinforce individual biases.

Next, participants who had indicated they had attended an unconscious bias training within the last 12 months engaged in a robust conversation discussing their **reasons for participating**. Four subthemes quickly emerged; personal development, curricular requirements for medical education or training, professional development and employer mandated. First, those who indicated reasons associated with personal development often referred to a desire for self-improvement or to gain a greater level of understanding. For example, one participant remarked, “*to better understand what I could do to better recognize implicit frames that may impact my understanding and relationship with others*”. Those who were in academic faculty roles indicated they did so not only for their own “*personal enrichment*” but also to apply to educating students and training residents. Several indicated they were required to participate in unconscious bias training as a standard part of their medical education and or residency training. The majority, nearly half of respondents, indicated their participation was associated with their professional development goals. For example, references to continuing medical education credits, additional graduate degree programs (i.e. healthcare administration, public health, etc.) and leadership development courses. Lastly, those who indicated their participation was the result of an employer mandate sometimes referred to it as “*corporate policy*” or a prerequisite to participating in certain activities such as clinical case reviews or interviewing applicants for medical school admissions. Future research should examine ways in which these reasons for

participation are influenced by personal factors (i.e. gender, age, stage of career, etc.) as well as organizational factors (i.e. policies, promotions, etc.).

In addition, this group discussed extensively the **features of unconscious bias training that resonate with physicians**. These included the normalization of bias, the neuropsychological research explaining the formation of bias and the use of medically relevant case studies demonstrating how it shows up in clinical practice. For participants, normalizing bias reduced the defensiveness, shame, and vulnerability around it. Statements such as “...it's normal human behavior, not a flaw” and being reminded of “how pervasive” it is were associated with reduced resistance to additional training constructs. Understanding the neuropsychological science, such as how bias is formed and triggered in the brain, helped to legitimize it, and providing case examples made it relatable to their previous medical education and training. For example, statements such as providing “case studies and scenarios with practice and feedback” and “case examples of how bias affects us” were deemed the most relevant part of training. Trainings in which these three features were absent were frequently described as effective at “raising awareness” but provided no “concrete tools” or “strategies” to address them. Understanding what works and what doesn't may lead to the development of some core standards for unconscious bias training, for which currently there are none and may be a factor contributing to the mixed findings regarding its effectiveness.

Lastly, this group of participants shared how they were **applying what they learned to practice** what they learned after participating in training. The results of training can be sorted into two categories, personal and practice outcomes. Personal

outcomes, such as references to gaining increased “*cultural humility*”, “self-awareness” and “objectivity” reflect participants’ intentions for personal development. Likewise, an increase in patient centeredness was reflected by one participant who indicated, “*I strive to put the patient’s goals for their health first. That seems to bring down any bias*”.

Others cited more deliberate actions related to changes in practice behaviors. Practice outcomes included an increased use of in-person interpreters to provide cultural background, developing customized individual treatment plans and increased communication with patients. Future research should consider the use of observational methods (i.e. ethnography, simulations, etc.) to examine post training behaviors between physicians and patients to determine its potential impact.

Discussion

Though small, the focus group participants represent a rather comprehensive cross-section of the broader AAFP membership [98]. Findings demonstrate that the reactions of practicing physicians towards unconscious bias training are rather consistent with other populations. There seems to be a great deal of variability in perspectives regarding how to respond effectively to unconscious bias and participants reasons for participating in trainings that warrant additional research that may lead to more effective interventions at levels beyond just targeting individuals. These findings have demonstrated that physicians have a clear indication of what works and what doesn’t from their perspective as the target audience and those factors should be taken into consideration when developing unconscious bias training interventions.

In addition, these findings closely resemble constructs proposed by the Transtheoretical (Stages of Change) Model in which participants cycle through decision

making check-points that ultimately result in maintenance of a change in behavior [108]. In this case the behavior is mitigation of unconscious bias. This model could potentially be applied by 1) developing self-assessment alternatives to the IAT that more objectively indicate which stage individuals enter into the process (i.e. awareness, resistance, responsiveness, etc.), 2) assigning individuals into peer learning cohorts that reduce the negative feelings associated with their unconscious biases (i.e. defensiveness, shame, etc.) and 3) establishing learning objectives that move individuals from one stage to the next until they reach “Maintenance” or sustained behaviors that ultimately reduce the impact of unconscious bias (Figure 4).



Figure 4 Stages of change towards unconscious bias self-mitigation

For physicians, mitigating unconscious bias should be considered as a deliberate, ongoing process that requires self-awareness and self-regulation where individuals check in with themselves on a regular basis to ensure that they are acting and making decisions based on a rational assessment of clinical situations rather than on stereotypes and prejudices. Likewise, organizations should begin to consider ways in which established cultural norms are associated with the unconscious biases of

individuals and identify opportunities to develop more inclusive environments which may have implications for patient health. As suggested little attention has been given to identifying and or implementing interventions at this level. Equal if not greater priority should be given to developing organizational assessments of policies, systems and procedures that may potentially be reinforcing unconscious bias and develop sustainable actions that can be used to mitigate it.

While the strength of the methods used in this study have been outlined, several limitations remain. First, selection bias for targeting members of the AAFP must be acknowledged. Potentially, there are unknown factors associated with choice of medical specialty, membership in a physician association and attendance at annual meetings that may also be associated with the values, perspectives and behaviors associated with this topic. Future studies should broaden the scope of study participants across various medical specialties and health care professions to limit the influence of selection bias on outcomes.

A second limitation considers risk to validity given that this study relies on recall and self-reported attitudes and behaviors from focus groups which may produce results that differ from the natural observation of participants. The cognitive overload health care professionals experience in the workplace as a result of things like stress, burnout and compassion fatigue may alter their behaviors in the practice setting and their perceptions of those behaviors, thus negating their self-reports [58]. One way to address this limitation is by conducting future studies that utilize an ethnographic approach to observe demonstrations of behaviors associated with unconscious bias in health care culture.

Lastly, the segmentation of the study into two focus groups in which one group has participated in an unconscious bias intervention and the other has not essentially only provides one set of data for each segment. A general rule of thumb in conducting qualitative research using focus groups is that three to five groups are adequate to reach saturation – the point at which additional data collection no longer generates new knowledge – and increasing the number of segments and or variability of the participants within and across groups requires more groups. Due to budget constraints (\$2650 per focus group), size of the research team (principle investigator, moderator and recorder) and the limited availability of participants (annually), the feasibility of conducting more than two focus groups at this time and in this location is just not plausible. However, the findings of this study should sufficiently justify the need for future research in this area and guide the development and implementation of future methods.

Conclusion

Though physicians are often the target of unconscious bias interventions, there's little evidence examining experiences with it from their perspectives, which potentially has implications for patient care. While some might outright reject the validity of unconscious bias, for others, there is a desire to be responsive and take actions that mitigate its effects. There are both personal and professional factors driving participation in unconscious bias training interventions, with some indication as to the influence of organizations. Organizations have a responsibility to their employees to examine ways in which workplace culture could be reinforcing unconscious bias and identify relevant interventions. Additional research is needed to further examine both

individual and organizational constructs to which more effective interventions to address unconscious bias can be developed to reduce health care disparities.

Chapter 6 – Implications

As indicated, this dissertation set out with the aim to examine the prevalence of unconscious bias within the healthcare workforce and conceptualize ways in which it may potentially result in disparate health outcomes. As these findings suggest, racial unconscious bias among the healthcare workforce differs significantly from that of the general public and can vary by geographic and provider type. This may provide some indication as to why unconscious bias educational training interventions have not yet demonstrated their effectiveness as they are incapable of hitting a moving target. In addition, these findings suggest that individual factors like social identity may have less of an association to unconscious biases as previously thought and suggest that there is potentially a greater need to examine external factors associated with the workplace and community. This perspective of greater organizational responsibility and accountability is shared by physicians however additional research is needed to examine unconscious bias in an organizational context and its potential impact on both physicians and patients.

More broadly, these findings may also be considered within the context of debates within the social sciences regarding the primacy of individual agency versus structure [109] . As it relates to healthcare, the question here is, “are the racially disparate clinical decisions of providers the result of their own individual autonomy, unconscious or otherwise, or socialization within a system of healthcare with norms, customs, policies, etc. designed from its inception to marginalize and minimize the healthcare needs of racial minorities”. These findings suggest the latter, and further justify the need to develop and implement interventions that focus on healthcare

systems and culture instead of individuals to reduce healthcare disparities effectively and sustainably. Furthermore, the following implications should be considered.

Policy

Several State and Federal policy actions supporting widespread implementation of unconscious bias education and training interventions have been proposed. For example, the MOMMAs Act (S.3776/H.R.5977) was introduced in 2018 and called for the establishment of regional centers of excellence to address unconscious bias and cultural competency in patient-provider interactions. These centers are intended to improve how health care professionals are educated on unconscious bias and the delivery of culturally competent health care. In addition, the Maternal Care Access, and Reducing Emergencies (CARE) Act (S.3363/H.R.6698) focuses specifically on institutional racism by providing funding for the implementation of unconscious bias training programs for clinicians and evidence-based culturally proficient support programs and services for pregnant women. In 2019, California was the first state to approve a bill (AB-241) that requires unconscious bias training for health care professionals, law enforcement and judicial employees. Several other states have proposed similar legislation.

These findings have demonstrated that within the healthcare workforce unconscious bias is highly variable and may also be influenced by other external factors, for which educational training interventions are not yet designed to address. As such, future legislative actions should consider placing a greater emphasis on continued research as opposed to mandates for an intervention that has not yet been proven efficacious nor meets the necessary standards to be considered evidence-based. Furthermore, continuing medical education mandates are often controversial, do not

always result in practice changes and in some instances can create barriers to licensure and certification [110, 111]. However, there still exist the need to create an overall sense of awareness and acknowledgement of the potential impact of unconscious bias to influence disparate outcomes, which is the responsibility of those organizations who oversee medical education and training. As these findings have demonstrated, organizations may have some influence on physicians' decisions to address their unconscious biases.

Education

As mentioned, regardless of efficacy, unconscious bias educational training interventions are being implemented and should be done so as just one approach of a larger strategy to address health care disparities. These training serve to raise awareness and an acknowledgement of the potential impact on patients. However, as these findings indicate, those should be implemented in a way that takes into consideration the variability of bias, influential factors on the individual learner, potential reactions and responses and training elements that are most applicable to those responsible for patient care. For faculty who design and deliver these programs there is often little guidance to prepare them to effectively manage these issues which is problematic for two reasons. First, unconscious bias educational trainings often involve emotionally charged discussions involving race, systematic oppression and social inequities which can quickly disrupt the learning environment and derail course objectives [106]. Second, it suggests a lack of standards in how training should be conducted which allows for a significant amount of variability when it comes to objectives, formats and style which presents a challenge to examining their

effectiveness. There is a need for a pedagogical approach to teaching unconscious bias to health care professionals that develops both skilled facilitators and learners.

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Appendices

Appendix A: Overview of Studies Associating Unconscious Bias to Patient Outcomes

Appendix A Overview of Studies Examining the Association of U.S. Healthcare Professionals' Implicit Bias and Patient Health Outcomes											
Review	Author	Year	Sample			Patient Type		Method			
			Who	Size	Method	Hypothetical or Real	Study Design	IB Measure	IB Type	Association w/Health Outcomes	
HALL	Blair	2013	Primary Care Physicians	210	convenience	Hypothetical	Cross-sectional	IAT	Race	NA	
HALL	Blair	2013	Primary Care Physicians	138	Convenience	Real	Cross-sectional	IAT	Race	None	
HALL	Blair	2014	Primary Care Providers	138	Convenience	Real	Cross-sectional	IAT	Race	None	
HALL	Cooper	2012	Primary Care Providers	40	Convenience	Real	Cross-sectional	IAT	Race and Medical Compliance	Communication	
HALL	Hagiwara	2013	Primary Care Physicians	14	Convenience	Real	Cross-sectional	IAT	Race	Communication	
HALL	Hausmann	2015	Physicians	14	Convenience	Real	Cross-sectional	IAT	Race	Spinal Cord Injuries	
HALL	Penner	2010	Primary Care Physicians	15	Convenience	Real	Cross-sectional	IAT	Race	Interactions	
HALL	Sabin	2008	Pediatricians	95	Convenience	Hypothetical	Cross-sectional	IAT	Race Attitude, Compliant Patient, Quality	none	
HALL	Sabin	2012	Pediatricians	86	Convenience	Hypothetical	Cross-sectional	IAT	Race, Medical Compliance, Quality	Treatment	

Appendix A Overview of Studies Examining the Association of U.S. Healthcare Professionals' Implicit Bias and Patient Health Outcomes											
Review	Author	Year	Sample			Patient Type		Method			Associ w/He: Outco
			Who	Size	Method	Hypothetical or Real	Study Design	IB Measure	IB Type		
Fitzgerald	Barnhart	2006	Physicians	544	Random	Hypothetical	Cross-sectional	Assumption	Race, Gender	None	
Fitzgerald	Kales	2005	Psychiatrists	321	Convenience	Hypothetical	Cross-sectional	Assumption	Race and Gender	None	
Fitzgerald	Kales	2005	Primary Care Physicians	178	Convenience	Hypothetical	Cross-sectional	Assumption	Race and Gender	none	
Fitzgerald	Lutfey	2009	Generalist	128	Random	Hypothetical	Cross-sectional	Assumption	Race, Gender, Age, SES	Diagnosis	
Fitzgerald	Lutfey	2010	Primary Care Physicians	256	Random	Hypothetical	Cross-sectional	Assumption	Race, Gender, Age, SES	Diagnosis	
Fitzgerald	Maserejian	2009	Primary Care Physicians	128	Random	Hypothetical	Cross-sectional	Assumption	Race, Gender, Age, SES	Diagnosis	
Fitzgerald	Maserejian	2009	Primary Care Physicians	256	Random	Hypothetical	Cross-sectional	Assumption	Race, Gender, Age, SES	Diagnosis	
Fitzgerald	McKinlay	2007	Primary Care Physicians	128	Random	Hypothetical	Cross-sectional	Assumption	Race, Gender, Age, SES	Treatment Diagnostic	
Fitzgerald	Tamayo-Sarver	2003	ER Physicians	2872	Random	Hypothetical	Cross-sectional	Assumption	Race	none	
Fitzgerald	Barnato	2011	Hospital Physicians	33	Convenience and Probability	Simulation	Cross-sectional	Assumption	Race	None	
Fitzgerald	Burgess	2008	Primary Care Physicians	382	Random	Hypothetical	Cross-sectional	Assumption	Race	none	
Fitzgerald	Moskowitz	2012	Physicians	27	Convenience	Hypothetical	Cross-sectional	Subliminal Priming	Race	Diagnosis	
Fitzgerald	Stepanikova	2012	Primary Care Physicians	81	Random	Hypothetical	Cross-sectional	Subliminal Priming	Race	Diagnosis	

Appendix A Overview of Studies Examining the Association of U.S. Healthcare Professionals' Implicit Bias and Patient Health Outcomes														
Review	Author	Year	Who	Sample			Patient Type				Method			Associ w/He: Outco
				Size	Method	Hypothetical or Real	Study Design	IB Measure	IB Type	Assoc w/He: Outco				
Dehon	Haider	2014	Surgeons	248	Convenience	Hypothetical	Prospective	IAT	Race and Class	none				
Dehon	Haider	2015	Surgeons	215	Convenience	Hypothetical	Prospective	IAT	Race and class	none				
Dehon	Oliver	2014	Primary Care Physicians	543	Convenience	Hypothetical	Cross- sectional	IAT	Race	none				
Dehon	Puumala	2016	ER Physicians	48	Convenience	Hypothetical	Cross- sectional	Other	Race	none				
	Penner	2016	Oncologists	130	Convenience	Hypothetical	Cross- sectional	IAT	Race	Communic:				
			Total	7375										

Appendix B: Summary of Unconscious Bias Intervention Studies

Appendix B Summary of Studies Evaluating the Effectiveness of Unconscious Bias Interventions in Pre-Health Professionals							
Author	Type of Bias	Intervention Method	Effective	Study Population	Methods	Analysis	Control
O'Brien (2010)	Obesity	Tutorial on uncontrollable reasons for obesity (genes/environment)	Yes	health promotion/public health bachelor's degree seeking students	pre-post	ANOVA	No
Rukavina (2010)	Obesity stereotype: fat/lazy versus thin/motivated	Classroom & service-learning components, including perspective taking	No	kinesiology pre-professionals	Pre-Post	ANOVA; MANOVA	Yes
Woodcock (2013)	Race: black/white	Ex. 1: Conditioning links between self and black	No	psychology students	posttest only	ANOVA	Yes
Devine (2012)	Race: black/white	Multi-faceted prejudice habit-breaking intervention including perspective taking	Yes	psychology students	Pre-Post	general linear models	Yes
Wallaert (2010)	Race: black/white	Ex. 1 Told to avoid stereotyping on IAT	Yes	psychology students			No
Wallaert (2010)		Ex. 2: Conditioning links between self and black (replication and extension)	Yes	psychology students			No
Stone (2019)	Racial Bias	Active Learning Workshop	Yes	Medical students	Pre-Post	Bivariate Correlations and Descriptive Statistics	No

Appendix C: Email Solicitation



MEMBER Insight Exchange

Share your insights with us

Your opinions are important to us. Our latest survey focuses on implicit bias testing and strategies to address, and thereby support, culturally appropriate patient-centered care.

Provide your insights into health disparities. Tell us what you think in this [brief survey](#).

Thank you for your continued participation in the AAFP's marketing research efforts and the invaluable insights you've provided.

Sincerely,
AAFP Marketing Research Team

[Take Survey »](#)

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Appendix D: AAFP Implicit Bias Survey

For purpose of this study we are defining Implicit (or Unconscious) Bias as the following:

Implicit bias is the unconscious collection of stereotypes and attitudes that we develop toward certain groups of people, which can affect our patient relationship and care decisions.

1. How familiar are you with the term “implicit bias” as described above?
 - Very familiar, have clear understanding of the term
 - Somewhat familiar, only heard of the term but never had a clear understanding of the meaning
 - Not at all familiar, never heard the term before now
2. Have you ever participated in implicit bias training?
 - Yes
 - No
3. How important do you think it is that implicit bias training should be included in the following?

	Very Important	Important	Neutral	Not Important	Not at all important
Medical School Education					
CME activities (Live or self-study)					
Residency training					

4. Have you ever taken an implicit bias test? The most common example is the implicit association test (IAI).
 - Yes
 - No
5. Please add any other comments or observations for educating family physicians about implicit bias and strategies to address it to support culturally appropriate, patient-centered care, and reduce health disparities.

Appendix E: AAFP Unconscious Bias Interview Guide

Location: Penn Convention Center; Room 3018, Philadelphia, PA

Group #1: Wednesday, Sept. 25; 1:00 to 2:30 PM – Criteria - Completed implicit bias training

Group #2: Thursday, Sept. 26; 11:00 to 12:30 PM – Criteria - No implicit bias training

I. Welcome/Introductions (5 minutes)

- My name is (Staff Name). The primary purpose of this discussion is to hear your thoughts on implicit bias training.
- ◆ Before we get started, here are some ground rules and points of information:
 - Discuss housekeeping rules
- ◆ REINFORCE OBJECTIVITY: Not looking for consensus, negative comments won't hurt, honest opinions are most helpful.
- ◆ CONFIDENTIALITY. Everything you say here will be kept strictly confidential. Nothing said in this group will ever be addressed with any individual by name. We would ask also that you similarly maintain the confidentiality of what is said in the group.
- ◆ AUDIOTAPING: This session is being audio taped so we can write an accurate report and we don't have to be taking notes throughout the discussion.
- Tell us about yourself, where you live, and where you work? What is your practice setting?

II. General Perceptions of Implicit Bias

- When you hear the term "implicit or unconscious bias" what comes to mind first? How would you explain this term to someone that wasn't familiar with it?
- [SHOW DEFINITION ON THE SCREEN]
Implicit bias is the unconscious collection of stereotypes and attitudes that we develop toward certain group of people, which can affect our patient relationships and care decisions.
- Based on this definition described on the screen, what are some examples of how implicit bias might be played out in a medical practice/setting? Describe scenarios in detail. PROBE:

- Differential treatment of patients by race, gender, weight, age, language, religion, ethnic background, income, specific diseases, or insurance status, etc.
- How does implicit bias contribute to health disparities? How might it influence clinical care? What is the clinical outcome of implicit bias? PROBE:
 - Patient behavior and decisions – higher treatment dropout, lower participation in screening, delays in seeking help, lack of filling prescriptions, etc.
- How serious of issue do you believe implicit bias is impacting the health of patients? If yes, how?
- In order to address the impact of implicit bias on clinical care decisions, what has your organization or practice implemented? Do you work as a group/team to uncover implicit biases and develop strategies to address them?
- What actions can you as a family physician do to combat implicit bias?

III. General Perceptions of Implicit Bias Training

IF PARTICIPATED IN TRAINING ASK:

- [SHOW OF HANDS] How many have participated in implicit bias training? How many years ago? What were the drivers of participating in the training?
- What did you value most from the training?
 - Increase awareness
 - Mindfulness
 - Change behavior
- Did you put in a practice any of the strategies you learned during the training? If yes, which ones? If no, why not?
- How confident are you in your ability to recall knowledge learned from the training? If yes, please explain? If no, why not?
- [SHOW POTENTIAL OUTCOMES ON THE SCREEN] Have you experienced any changes in any of the following as a result of the training? If yes, please explain how? Give examples.
 - Job satisfaction
 - Cultural competence
 - Patient-centered care/relationships
 - Communication skills (body language and verbal cues)
 - Perspective-taking
 - Learned to slow down

- Learn/educate your blind spots
- What are the shortcomings of implicit bias training? Barriers?
- How important do think is it that implicit bias training be included in the medical school training? Residency training? CME activities?

IF NO TRAINING ASK:

- [SHOW OF HANDS] How many have participated in implicit bias training? Have you had any opportunities to participate in training? If yes, when, and where? Why didn't you participate?
- If you had the option to participate in implicit bias training, what would be the key drivers for participation? What would be the expected benefits? Value proposition?
- What type of training would you find most valuable?
- How important do think is it that implicit bias training be included in the medical school training? Residency training? CME activities?

IV. AAFP's Resources on Implicit Bias

- How should the AAFP communicate the value of implicit training to family physicians? Where should we focus our messaging? What would be compelling? Probe:
 - Facts/numbers/statistics
 - Illustrative examples
 - Narratives
 - Testimonials
 - Theory to action
- How should the AAFP motivate family physicians and their teams to adopt strategies for controlling implicit bias?
- SHOW CONCEPT OF AAFP's IMPLICIT BIAS WEBSITE? CONCEPT? QUALITY IMPROVEMENT? AS PART OF A WIDER PROGRAM? CME ACTIVITY
- Thanks for your time.

Appendix F: Consent for Participation in a Research Study

Title Protocol # 19-358

The American Academy of Family Physicians (AAFP) Center for Diversity and Health Equity: Identifying Family Physicians' Values, Knowledge and Barriers Regarding Implicit Bias Training

Investigators

Danielle D. Jones

Invitation to Participate

As a member of the AAFP you are being asked to participate in a focus group discussing perceptions and knowledge of implicit (unconscious) bias and its effects on patient health outcomes. The main purpose of this study is to create new knowledge for the benefit of informing the development and implementation of future implicit bias training and education curricula. Research studies may or may not benefit the people who participate. Research is voluntary, and you may change your mind at any time. There will be no penalty to you if you decide not to participate, or if you start the study and decide to stop early. This consent form explains what you should do if you are in the study. It also describes the possible risks and benefits. Please read the form carefully and ask as many questions as you need to, before deciding about this research. You can ask questions now or anytime during the study. The researchers will tell you if they receive any new information that might cause you to change your mind about participating. This research study will take place as part of the American Academy of Family Physicians Family Medicine Experience (FMX).

Who will Participate

24 members of the AAFP have been invited to participate in one of two focus groups during FMX. Eligible participants were identified based on a short survey disseminated to the Member Insight Exchange asking about participation in implicit bias training.

Purpose

The purpose of this study is to understand physicians' knowledge, perceptions, behaviors, and skills associated with implicit bias education and training. Participants will be asked about their behaviors following an implicit bias training as well as barriers to participating in training.

Procedures

Participation in this study consist of a group interview that will last approximately 1.5 hours. The study takes place at the Penn Convention Center; Room 3018 on Wed. Sept. 25; 1:00 to 2:30 PM and again on Thursday, Sept. 26; 11:00 to 12:30 PM in Philadelphia, PA. Both sessions will be audio-recorded so that the researchers have an accurate record of the interview and notes will stored securely on a password protected network in accordance with the AAFP's record management requirements.

Voluntary Participation

Research studies may or may not benefit the people who participate. Research is voluntary, and you may change your mind at any time. There will be no penalty to you if you decide not to participate, or if you start the study and decide to stop early. This consent form explains what you should do if you are in the study. It also describes the possible risks and benefits. Please read the form carefully and ask as many questions as you need to, before deciding about this research. You can ask questions now or anytime during the study. The researchers will tell you if they receive any new information that might cause you to change your mind about participating.

Fees and Expenses

There is no monetary cost to the participants.

Payments for Participation

Members will receive a \$150 gift card for their participation.

Risks and Inconveniences

The interview questions may be personal. Some of the questions might be embarrassing or uncomfortable. You are free not to answer any questions. The risk for someone outside of the research study to learn of your participation or responses is low. Your name will not be used in any publication or presentation about this research. There may be other risks of the study that are not yet known.

Benefits

Researchers hope that the information collected from this study may be useful in understanding physician educational and training needs and improve the quality of care delivered to patients.

Alternatives to Study Participation

Participation in this study is voluntary. Deciding not to participate will have no effect on your membership in the AAFP.

Confidentiality

Interviews be audio-recorded and transcribed so that the researchers have an accurate record. All audio and notes will be stored securely on a password protected network in accordance with the AAFP's record management requirements. While every effort will be made to keep confidential all of the information you complete and share, it cannot be absolutely guaranteed. Individuals from the American Academy of Family Physician's

Institutional Review Board (a committee that reviews and approves research studies) and Federal regulatory agencies may look at records related to this study for quality improvement and regulatory functions.

Future Use

Subject's information will not be used or distributed for future research.

In Case of Injury

Although it is not the AAFP's policy to compensate or provide medical treatment for persons who participate in studies, if you think you have been injured as a result of participating in this study, please contact Jennifer Farris, AAFP IRB Assistant, at 913-906-6134 or *jfarris@aafp.org*

Questions

If you have any questions about the study that you are participating in you are encouraged to contact Danielle Jones, the investigator, at 913-906-6319 or djones@aafp.org. If you have any questions about your rights as a research subject, you are encouraged to contact Jennifer Farris, AAFP IRB Assistant, at 913-906-6134 or jfarris@aafp.org. Signing here means that you have read the information provided in this Informed Consent Form and have had your questions answered to your satisfaction, and voluntarily agree to participate in this study. This consent or a copy of this consent will be kept

_____	_____	_____
Printed Name (Participant)	Signature	Date

_____	_____	_____
Printed Name (Investigator)	Signature	Date