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Testimony of:

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Associated Medical Schools of New York (AMSNY)

New York State Academic Dental Centers (NYSADC)

At a Joint Budget Hearing of

The New York State Assembly/Senate Committees on Health

&

The New York State Senate Committee on Finance &

The New York State Assembly Committee on Ways and Means

January 23, 2024

9:30AM

Hearing Room B

Good afternoon, Chairs Weinstein, Krueger, Paulin and Rivera and other distinguished members of the New York State Legislature. Thank you for this opportunity to testify on the Executive budget proposal for state fiscal year 2025.

Thank you for this opportunity to testify about healthcare workforce issues that are of particular importance to New York State's medical and dental schools.

My name is Jonathan Teyan, President and Chief Executive Officer of the Associated Medical Schools of New York (AMSNY) and the New York State Academic Dental Centers (NYSADC).

AMSNY is the consortium of the academic medical centers in New York and we strive to be the voice of medical education in the state. To that end, we advocate for policies that help advance the education and training of physicians, support biomedical research and provide New Yorkers with access to the very best clinical care.

NYSADC is the consortium of the six dental schools in New York State and works to advance dental education and address disparities in oral health care, particularly as it pertains to access and treatment for individuals with intellectual or other developmental disabilities.

AMSNY runs collaborative programs across the medical schools and has for decades invested in initiatives that create pathways to careers in medicine. The Diversity in Medicine Program, which launched in 1991 and has been supported by New York State since 2001, consists of a large and growing portfolio. These initiatives offer opportunities to talented students who are committed to becoming physicians and who have demonstrated resilience in overcoming adversity on the path to medical school. Many of the students who come through one of our 19 programs will continue on to practice medicine in underserved communities and an even greater number will remain in New York practicing medicine for many years to come.

I would first like to thank the Legislature for its unwavering support for the Diversity in Medicine Program and Diversity in Medicine Scholarship. The recent expansion of Diversity in Medicine – which now encompasses 17 programs throughout the state and the Scholarship program – is due to the recognition by the Legislature and the Governor that investing in a diverse physician workforce is a key component in addressing health disparities in New York State.

AMSNY's Diversity in Medicine Program

The AMSNY Diversity in Medicine programs are both opportunity programs for students and healthcare workforce development programs focused on improving the health and welfare of New York State.

AMSNY's Diversity in Medicine programs offer opportunities to talented students who are committed to becoming physicians and who have demonstrated resilience in overcoming adversity on the path to medical school. The programs consider students' academic potential within the context of their paths traveled, including life circumstances, other responsibilities during their academic careers and access to resources and opportunities. AMSNY's Diversity in Medicine programs also seek to expand diversity in the physician workforce in order to reduce healthcare disparities, improve outcomes and address inequities in New York State. Students in these programs have a demonstrated commitment to addressing healthcare disparities and health inequities through medicine, science, research and advocacy. As examples, the programs look to such experiences as working with disadvantaged communities and other alignment with the AMSNY Diversity in Medicine mission.

Mission and Impact

Short-term Impact
AMSNY's Diversity in Medicine programs aim to support students interested in medicine and develop future physicians by removing barriers and expanding opportunities for eligible students to pursue careers in medicine and the biomedical sciences.

Medium-term Impact
AMSNY's Diversity in Medicine programs aim to create a supportive community conducive to learning, collaboration and professional growth. A diverse and inclusive medical student population benefits all learners during their medical education.

Long-term Impact
AMSNY's Diversity in Medicine programs seek to expand diversity in the physician workforce in order to reduce healthcare disparities, improve health outcomes and address inequities in New York State. Since 1985, AMSNY has supported an array of pipeline programs across the state with the intent of expanding the pool of students choosing careers in health and medicine. The goal of these programs is to provide academic enrichment and support to students from educationally and/or economically underserved backgrounds.

AMSNY oversees 17 programs as part of its Diversity in Medicine program that ultimately lead students into medical school, including post-baccalaureate programs at the Jacobs School of Medicine & Biomedical Sciences, University at Buffalo, the Norton College of Medicine at SUNY Upstate, the Renaissance School of Medicine at Stony Brook University, SUNY Downstate Health Sciences University and New York Medical College. These programs are remarkably effective; 93% of students who participate in AMSNY's post-baccalaureate program at the University at Buffalo enter medical school and 85% graduate. 94% of the students in our Master's degree post baccalaureate programs enter medical school.

The other Diversity in Medicine programs are offered along the educational continuum, including:

- More than 500 students in the Pathways to Careers in Medicine and Research Program at City College of New York, and the Learning Resource Center at CUNY School of Medicine.

- More than 220 students participating in 10 programs at the Bronx Community Health Leaders with Montefiore Medical Center/Albert Einstein College of Medicine; Icahn School of Medicine at Mount Sinai; Mentoring in Medicine, Inc.; Norton College of Medicine at SUNY Upstate Medical University; NYU Grossman School of Medicine; NYU Long Island School of Medicine; Renaissance School of Medicine at Stony Brook University; SUNY Downstate Health Sciences University; Touro College of Osteopathic Medicine; and University of Rochester School of Medicine and Dentistry.

Diversity in Medicine Scholarship Program

Paying for medical school is a daunting challenge. A majority of medical school graduates complete their education with the assistance of student loan financing. The median level of principal debt for students graduating in 2020 was $200,000 (based on public and private MD-granting schools, including undergraduate debt). Including accrued interest, median student debt is more than $230,000.
In SFY 2017-2018, AMSNY received a $500,000 investment from the State to launch the Diversity in Medicine Scholarship program. The scholarship—indexed to the average cost of SUNY medical school tuition— helps students by eliminating the financial barrier to medical school. In 2023-2024, the Legislature increased the funding to $1 million, enabling us to award 18 scholarships annually to students who have completed one of the Diversity in Medicine post-baccalaureate programs. In return, the scholarship awardees commit to working for at least two years in an underserved area in New York. Scholarship students are entering all fields of medicine: primary care, internal medicine, emergency medicine, anesthesiology and urology among others.

These students are deeply committed to practicing in underserved areas of New York State – areas where all of these specialties are needed. In addition, AMSNY has been able to leverage the State's investment to secure funding from the Mother Cabrini Health Foundation, which is supporting an additional 15 scholarship awardees.

For State Fiscal Year 2024-2025, AMSNY is requesting level funding for the Diversity in Medicine program at $3.644 million to continue the historic expansion of these programs to meet the needs of students and continue to help address workforce shortfalls. We were pleased to see this appropriation included in the Governor's Executive Budget proposal. AMSNY also requests that the Legislature again appropriate $1 million for the Diversity in Medicine Scholarship to fund another 18 scholarships for students who will return and care for communities in need in New York State.

Closing

Thank you for the opportunity to testify today and for your continued support of academic medicine. I welcome any questions you may have.

Respectfully submitted,
Jonathan Teyan, President and Chief Executive Officer

AMSNY Member Institutions
Albany Medical College
Albert Einstein College of Medicine
Columbia University Vagelos College of Physicians and Surgeons
CUNY School of Medicine
Icahn School of Medicine at Mount Sinai
Jacobs School of Medicine and Biomedical Sciences, the University at Buffalo
NYU Langone Health
New York Institute of Technology College of Osteopathic Medicine
New York Medical College
Renaissance School of Medicine at Stony Brook University
School of Medicine and Dentistry at the University of Rochester Medical Center
SUNY Downstate Health Sciences University
Norton College of Medicine at SUNY Upstate Medical University
Touro College of Osteopathic Medicine
Weill Cornell Medicine
Zucker School of Medicine at Hofstra/Northwell

NYSADC Member Institutions
Columbia University College of Dental Medicine
New York University College of Dentistry
Stony Brook University School of Dental Medicine
Touro College of Dental Medicine
University at Buffalo School of Dental Medicine
University of Rochester School of Medicine & Dentistry

Appendix A: Diversity in Medicine Program Outcomes

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Diversity in Medicine Program Portfolio

The 2023-24 New York State budget appropriated $3.644 million to support the AMSNY Diversity in Medicine Program, an increase of $1.2 million over the prior year and an increase of $2.4 million over 2021-22. After more than a decade of flat or declining budgets for Diversity in Medicine, these increases represent an historic investment by the State in programs for students who have overcome adversity on the path to medical school and an investment to improve healthcare outcomes for all New Yorkers.

The support from the State has enabled AMSNY to expand the number of students enrolled in its post-baccalaureate programs and increase stipend support. The post-baccalaureate programs are the cornerstone of Diversity in Medicine, providing conditional acceptance to medical school for students who successfully complete the program requirements. AMSNY currently supports five post-baccalaureate programs throughout the state:

Jacobs School of Medicine and Biomedical Sciences, the University at Buffalo, SUNY. The AMSNY Post-Baccalaureate Program is the flagship of the Diversity in Medicine program and has enrolled its 33rd cohort this year. Since its inception in 1991, the program has graduated more than 500 practicing physicians.

New York Medical College, MS in Interdisciplinary Basic Medical Sciences

Norton College of Medicine at SUNY Upstate Medical University, MS in Medical Technology

Renaissance School of Medicine at Stony Brook University, MS in Biomedical Sciences

SUNY Downstate Health Sciences University, MS in Physiology

In addition to the post-baccalaureate programs, AMSNY's Diversity in Medicine Program continues to support **CUNY School of Medicine's** Learning Resource Center, which provides talented and gifted students with the resources, skills and support they need to succeed in college and medical school. Since its inception, the program has provided thousands of counseling and workshop hours to students.

Since 2002, AMSNY has supported a program that pairs undergraduate students at **City College of New York** with scientists funded by National Institutes of Health to conduct laboratory research and prepare students to enter MD or PhD programs.

AMSNY is continuing to support **MAP to Success: A Medical Application Preparation Program,** with two students at New York Medical College and one student at Renaissance School of Medicine at Stony Brook University.

Diversity in Medicine Expansion Programs
In response to the 2023-24 funding increase, AMSNY issued a request for proposals (RFP) in April 2023 to identify effective and innovative pre- and post-matriculation programs that prepare students to enter medical school and support their success during their medical education. The Diversity in Medicine Program is supporting 10 programs identified through the RFP process in 2023-24:

Center for Scientific Diversity (CSD) Leveraging AIM-HI for Well Being (LAB) Program (Icahn School of Medicine at Mount Sinai) will support and expose students who are underrepresented in medicine to careers as physicians and physician-scientists by highlighting research and clinical engagement. The CSD LAB will engage students at the high school, undergraduate, post-baccalaureate, and medical school levels.

Bronx Community Health Leaders (Albert Einstein College of Medicine) will enhance competency-based skills identified by the American Association of Medical Colleges (AAMC) through didactic seminars, clinical exposure, and longitudinal peer mentorship.

Bridge to Clerkship (CUNY School of Medicine) aims to facilitate success for M2 students who choose to delay entry into M3 clerkships to better prepare for the USMLE Step I exam. Students will partake in a curriculum consisting of supplementary instruction by peer tutors, clinical examinations, wellness seminars, and access to Step I subscription resources.

Rising Docs (Mentoring in Medicine, Inc.) will assist students who have been rejected by medical schools by enabling the development of critical social, emotional, and academic skills necessary to matriculate to medical schools. Rising Docs is a 12-week virtual program that will provide students will hard skills and Social Emotional Learning.

Envision Scholars Academy (NYU Long Island School of Medicine) will provide exposure to medicine, professional development and mentorship to tenth and eleventh-grade high school students and freshman and sophomore college students. Students will participate in hands-on workshops that cover a range of medical disciplines with a focus on primary care specialties and attend professional development workshops.

Expanded Stony Brook Underrepresented Pre-Med Scholars (eSUPREMES) Program (Stony Brook University/Renaissance School of Medicine) aims to adequately prepare students who are underrepresented in medicine from Stony Brook University, neighboring schools and community colleges for admission into Renaissance School of Medicine at Stony Brook University. The program will provide faculty and peer mentorship, didactic courses, MCAT preparation and research opportunities.

Expanding Support for URiM Students at URSMD (University of Rochester School of Medicine and Dentistry) will expand the support for students from underrepresented backgrounds in medicine through the Bridge to Mentorship initiative. The expanded support includes components such as asynchronous problem-solving, individualized/group tutoring, and professional development sessions provided by former medical students.

Upstate Public Health Scholars Program (Norton College of Medicine at SUNY Upstate Medical University) aims to create pathways into medicine for applicants from disadvantaged backgrounds by defraying the costs of tuition and living expenses for Public Health Scholars.

Supporting, Educating and Enriching Diversity (SEED) Mentoring Program (NYU Grossman School of Medicine) will provide mentorship to medical students who are underrepresented in medicine, emphasizing professional development, community building and education.

Touro College of Osteopathic Medical Master's Program – Expanding the Bridge to Medical School (Touro College of Osteopathic Medicine) will provide support for applicants who are underrepresented in medicine in the Master of Science Program and improve matriculation into medical school. Upon successful completion of the post-baccalaureate program, students will be offered direct matriculation into the entering DO class and obtain a Master of Science in Interdisciplinary Studies in Biological and Physical Science.

Associated Medical Schools of New York
Diversity in Medicine Program
2022–2023 Program Outcomes Data

Post-Baccalaureate & Master's Degree Programs

School	Program Type
Jacobs School of Medicine & Biomedical Sciences, the University at the Univeristy at Buffalo	Post-Baccalaureate Program
New York Medical College	Master of Science (MS) Degree in Basic Medical Sciences
Norton College of Medicine at SUNY Upstate Medical University	Master of Science (MS) Degree in Medical Technology
Renaissance School of Medicine at Stony Brook University, SUNY	Master of Science (MS) Degree in Biomedical Sciences
SUNY Downstate Health Sciences University	Master of Science (MS) Degree in Physiology

93% **OF STUDENTS COMPLETED THE PROGRAM & MATRICULATED INTO MEDICAL SCHOOL**

Student Demographics	American Indian/ Alaska Native	Black/African American	Hispanic/Latinx	Two or More Races/Ethnicities
	4%	50%	29%	13%

Other Diversity in Medicine Pipeline Programs

Institution	Program	Outcomes (percent of participating students)
CUNY School of Medicine	Learning Resource Center	➢ 95% of students who participated in the Pre-Matriculation Program would recommend the program to incoming classes ➢ 98% rated peer tutoring effective ➢ 97% rated academic workshops effective
City College of New York	Pathways to Careers in Medicine and Research	➢ 100% presented their research at a scientific conference

AMSNY's Diversity in Medicine Program is supported by grant funding from the New York State Department of Health.

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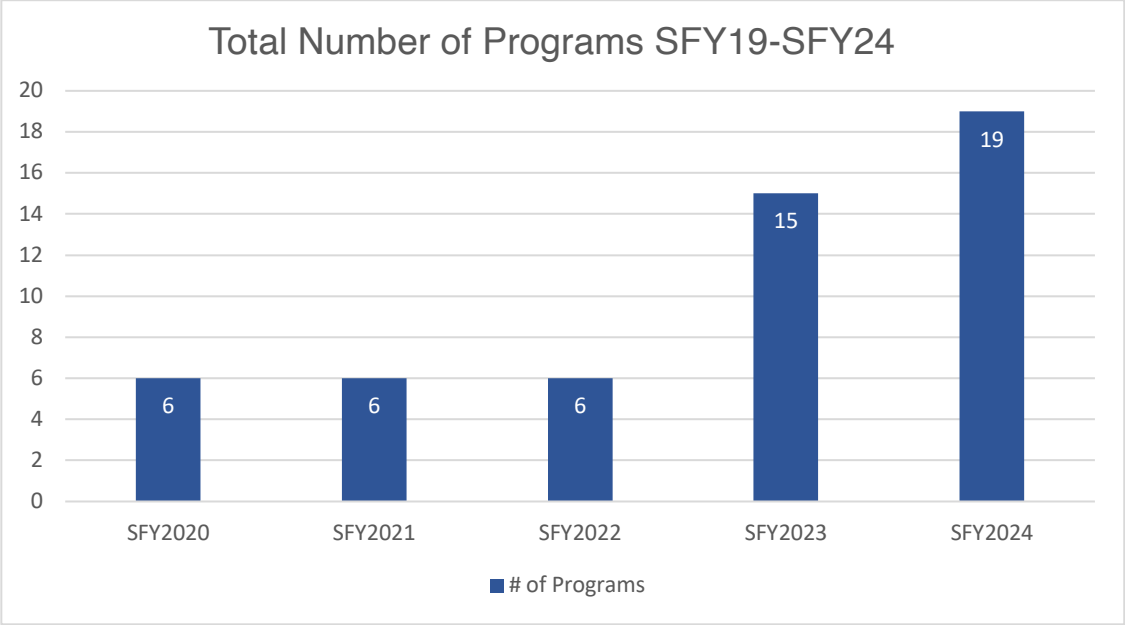
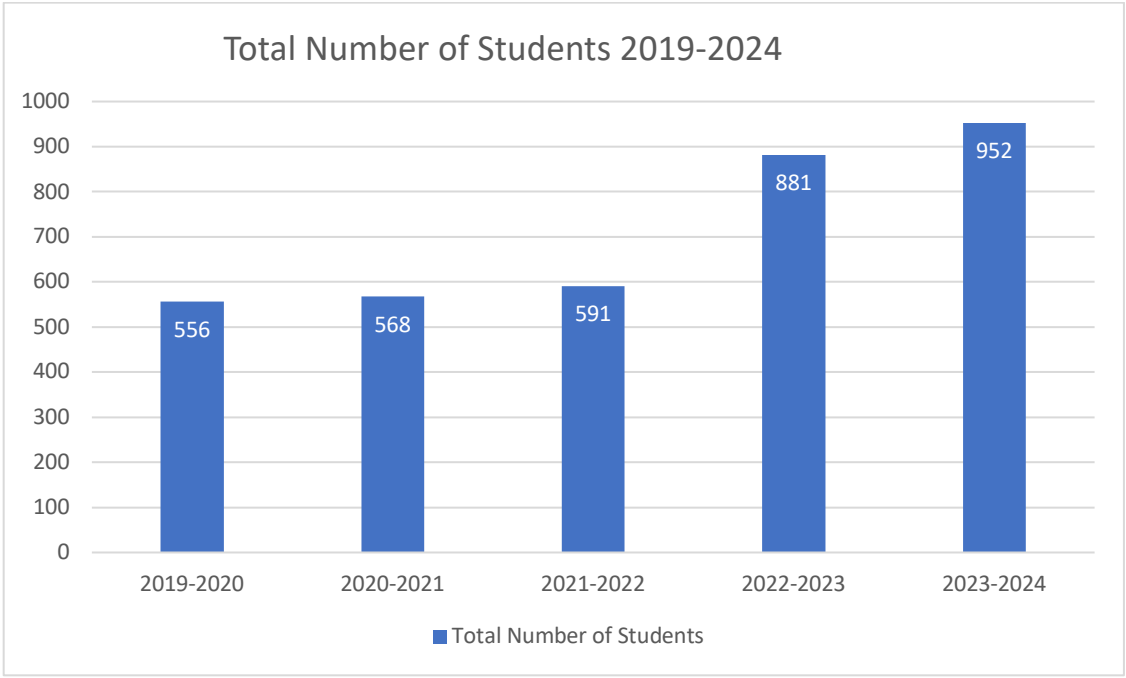
AMSNY Diversity in Medicine Programs Report

AMSNY program enrollment over the past 5 years

Overview

For the 2023-24 program year, AMSNY is supporting 19 programs, an increase from 15 programs in SFY2023 and 952 students, an increase from 881 students in 2022-23.





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Total Number of Students Per Program

2023-24 Diversity in Medicine Program	Fall 2023 Number of Students
Post-Baccalaureate/Master's Programs	
Jacobs School of Medicine & Biomedical Sciences, the University at Buffalo	24
New York Medical College	8
Norton College of Medicine at SUNY Upstate Medical University	8
Renaissance School of Medicine at Stony Brook University	0
SUNY Downstate Health Science University	10
Pathways to Careers in Medicine and Research (City College of New York)	19
CUNY Learning Resource Center	557
MAP to Success: A Medical Application Preparation Program	
New York Medical College	2
Renaissance School of Medicine at Stony Brook University	1
Expansion Programs	
AIM-HI for Well Being Program (Icahn School of Medicine at Mount Sinai)	15
Bridge to Clerkship (CUNY School of Medicine)	24
Bronx Community Health Leaders (Albert Einstein College of Medicine)	126
Envision Scholars (NYU Long Island School of Medicine)	29
eSUPREMES (Renaissance School of Medicine at Stony Brook University)	10
Expanding Support for URiM Students (University of Rochester School of Medicine and Dentistry)	34
Expanding the Bridge to Medical School (Touro College of Osteopathic Medicine)	10
Public Health Scholars (Norton College of Medicine at SUNY Upstate Medical University)	7
Rising Docs (Mentoring in Medicine, Inc.)	17
SEED Mentoring Program (NYU Grossman School of Medicine)	51
TOTAL NUMBER OF STUDENTS	**952**

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Diversity in Medicine Scholarship 2023-24

The seventh scholarship application cycle opened on May 1, 2023, with 45 applications successfully submitted. **There were 33 awards available for the 2023-24 academic year.** Eleven applicants had previously been awarded the scholarship for the first time in the 2022-23 academic year and were awarded a second year of support given their good academic standing. The remaining 22 awards were available for those to be interviewed.

The Scholarship Review Committee comprised 14 individuals, 12 of whom are members of AMSNY's Committee for Diversity and Multicultural Affairs (CDMA). Each applicant had two committee members review their application and interview them. Applications were scored and a round-table discussion with the Review Committee resulted in the final selection of 22 scholarship recipients. Award letters were sent out on August 1, 2023.

The data below shows the statistics for this year's recipients.

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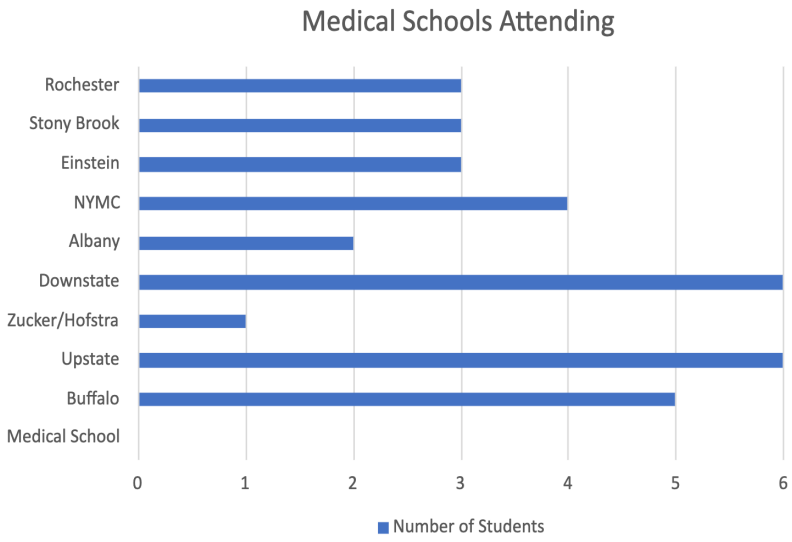
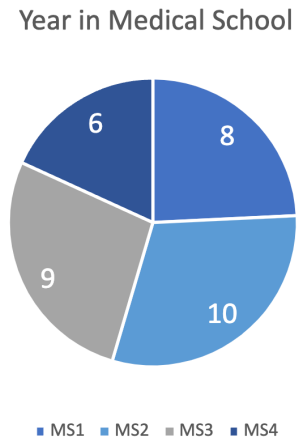
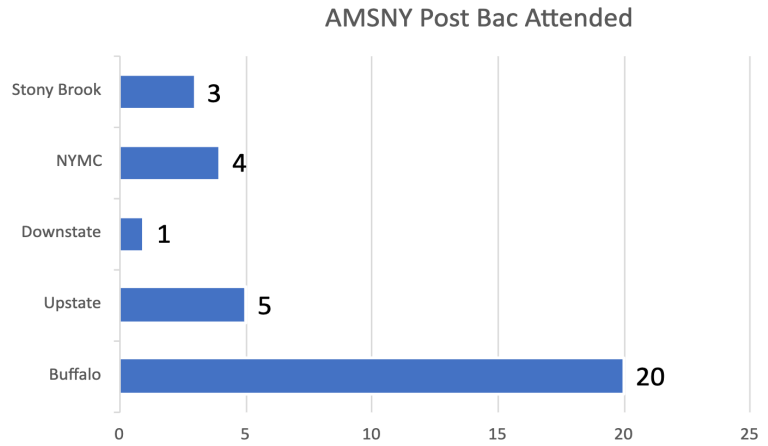
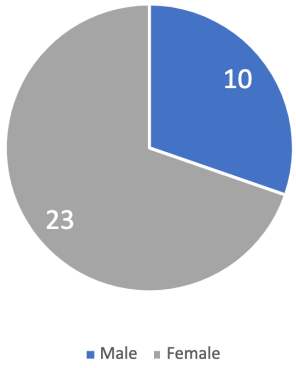
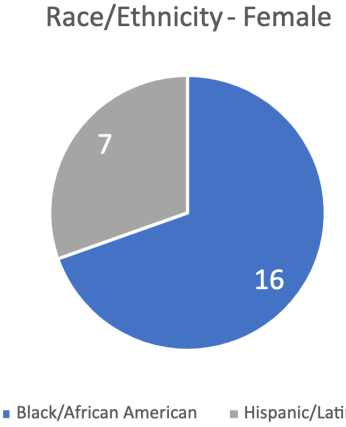
2023-2024 Diversity in Medicine Scholarship Recipients (*n* = 33)

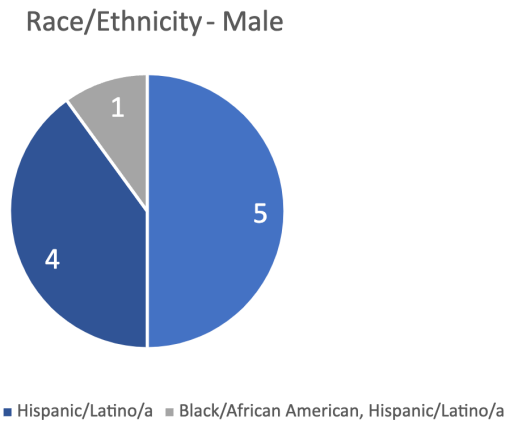












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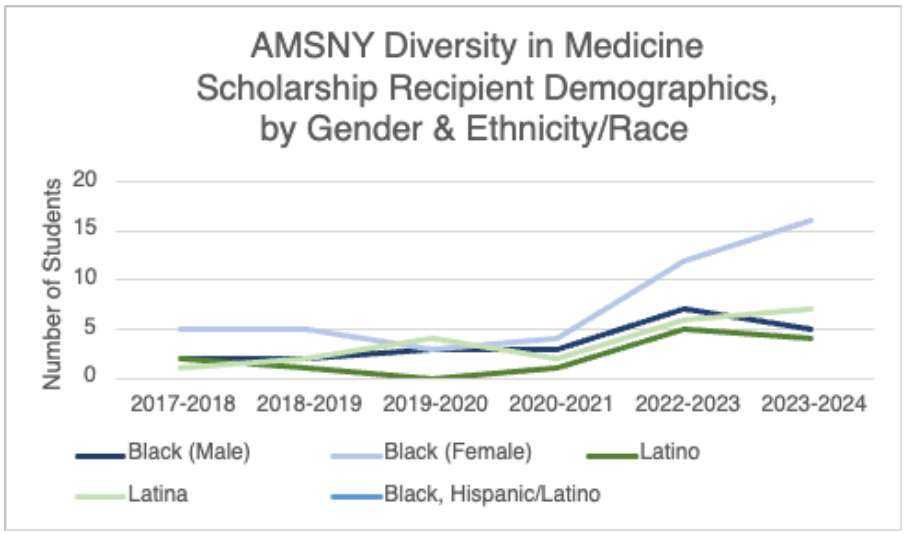

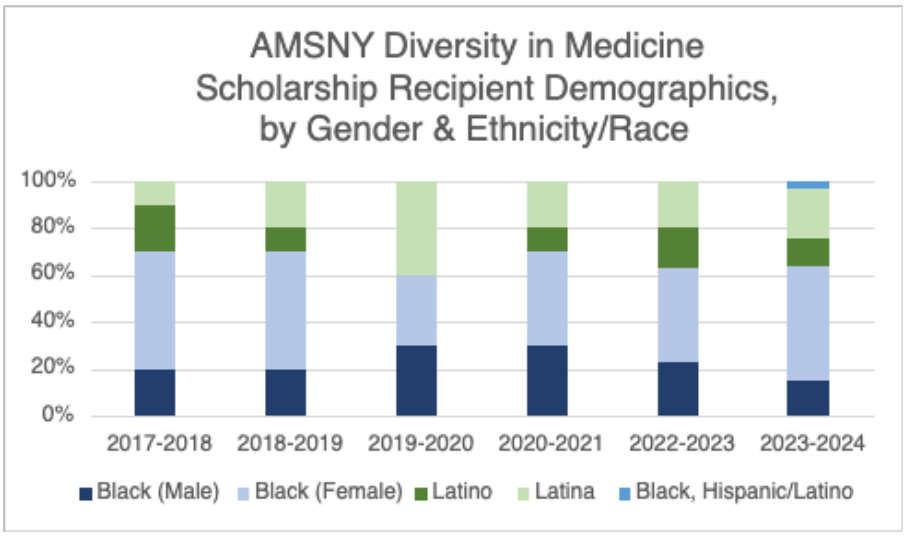

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Appendix B: Black Representation in the Primary Care Workforce

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JAMA Network Open

Original Investigation | Equity, Diversity, and Inclusion

Black Representation in the Primary Care Physician Workforce and Its Association With Population Life Expectancy and Mortality Rates in the US

John E. Snyder, MD, MS, MPH; Rachel D. Upton, PhD; Thomas C. Hassett, PhD; Hyunjung Lee, PhD, MS, MPP, MBA; Zakia Nouri, MA; Michael Dill, MAPP

Abstract

IMPORTANCE Studies have suggested that greater primary care physician (PCP) availability is associated with better population health and that a diverse health workforce can improve care experience measures. However, it is unclear whether greater Black representation within the PCP workforce is associated with improved health outcomes among Black individuals.

OBJECTIVE To assess county-level Black PCP workforce representation and its association with mortality-related outcomes in the US.

DESIGN, SETTING, AND PARTICIPANTS This cohort study evaluated the association of Black PCP workforce representation with survival outcomes at 3 time points (from January 1 to December 31 each in 2009, 2014, and 2019) for US counties. County-level representation was defined as the ratio of the proportion of PCPs who identifed as Black divided by the proportion of the population who identified as Black. Analyses focused on between- and within-county influences of Black PCP representation and treated Black PCP representation as a time-varying covariate. Analysis of between-county influences examined whether, on average, counties with increased Black representation exhibited improved survival outcomes. Analysis of within-county influences assessed whether counties with higher-than-usual Black PCP representation exhibited enhanced survival outcomes during a given year of heightened workforce diversity. Data analyses were performed on June 23, 2022.

MAIN OUTCOMES AND MEASURES Using mixed-effects growth models, the impact of Black PCP representation on life expectancy and all-cause mortality for Black individuals and on mortality rate disparities between Black and White individuals was assessed.

RESULTS A combined sample of 1618 US counties was identified based on whether at least 1 Black PCP operated within a county during 1 or more time points (2009, 2014, and 2019). Black PCPs operated in 1198 counties in 2009, 1260 counties in 2014, and 1308 counties in 2019—less than half of all 3142 Census-defined US counties as of 2014. Between-county influence results indicated that greater Black workforce representation was associated with higher life expectancy and was inversely associated with all-cause Black mortality and mortality rate disparities between Black and White individuals. In adjusted mixed-effects growth models, a 10% increase in Black PCP representation was associated with a higher life expectancy of 30.61 days (95% CI, 19.13-42.44 days).

CONCLUSIONS AND RELEVANCE The findings of this cohort study suggest that greater Black PCP workforce representation is associated with better population health measures for Black individuals, although there was a dearth of US counties with at least 1 Black PCP during each study time point. Investments to build a more representative PCP workforce nationally may be important for improving population health.

JAMA Network Open. 2023;6(4):e236687. doi:10.1001/jamanetworkopen.2023.6687

Key Points

Question Is Black representation in the US primary care physician (PCP) workforce associated with population health outcomes?

Findings In this cohort study of survival outcomes for 1618 US counties, Black PCPs operated in less than half of all counties during each of 3 time points assessed (2009, 2014, and 2019). On average, every 10-percent increase in county-level Black PCP representation was associated with 31-day higher age-standardized life expectancy among Black individuals. Higher Black PCP representation levels were also associated with lower all-cause mortality rates among Black individuals and with reduced mortality rate disparities between Black and White individuals.

Meaning These findings suggest that greater representation of Black PCPs in the PCP workforce is associated with improved survival-related outcomes for Black individuals.

+ Invited Commentary

+ Supplemental content

Author affiliations and article information are listed at the end of this article.

Introduction

Various studies have shown correlations between higher primary care service availability and better population health outcomes.[1-11] For example, Basu et al[1] demonstrated that higher county-level primary care physician (PCP) supply is associated with increases in life expectancy and decreases in cardiovascular, cancer, and respiratory cause-specific mortality. Despite the established public health benefits for primary care, access to primary care services remains uneven across the nation, partly due to an insufficient number and uneven distribution of PCPs.[12] However, PCP workforce shortfalls are just one facet of existing accessibility challenges. Patients in the health care safety net—that is, those with geographic, financial, insurance-related, linguistic, racism- or discrimination-related, and other barriers—experience disproportionate difficulties in accessing primary care and other essential health services.[13-19] Life expectancy disparities between Black and White individuals have persisted for decades and have improved only modestly over time.[20-22] While primary care availability appears to be important for everyone, some studies stratified by race suggest that there may be a more powerful inverse association between access and mortality for Black individuals.[2,6]

Prior work suggests that racial and ethnic minority PCPs provide a disproportionately large share of care nationally to racial and ethnic minority individuals, low-income and uninsured patients, and other historically underserved groups.[23,24] Accordingly, building a more racially and ethnically diverse physician workforce has been cited as a means for expanding access to high-need specialties; providing more culturally competent care to racial, ethnic, and linguistic minority populations; offering patients greater choice for seeking care in line with their preferences; strengthening care quality; reducing health disparities; and better meeting the needs of the nation's diverse populace.[23-31] However, Black individuals and other racial and ethnic minority individuals have historically been underrepresented in the majority of health professions that require multiple years of advanced training, including medicine.[32-34]

Beyond the moral imperative to create equitable health career opportunities for all and to build a more diverse, representative physician workforce, the literature on the beneficial health outcomes from doing so primarily appears to focus on care access and utilization, patient adherence, physician communication, and patient experience of care measures.[35-39] Evidence around any potential gains in clinical and public health outcomes from diversifying the physician workforce is more limited, and existing work in this area often focuses specifically on physician-patient racial concordance.[25,40-42] As such, this investigation explores whether there is a county-level association between the degree of Black representation in the primary care workforce and key population health markers, including all-cause mortality rates, age-adjusted life expectancy, and all-cause excess mortality rates, a measure of health disparities between Black and White individuals.

Methods

This cohort study was deemed exempt from institutional review board review under US Department of Health and Human Services regulations by the Alpha Independent Review Board. Informed consent was waived because it was not practicable to obtain consent from large numbers of physicians for a retrospective study. Data in the American Medical Association (AMA) Physician Masterfile are commonly used for research and other purposes, and physicians may opt out from their information being listed in this data set. The study followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guideline.

Independent Variables

This investigation was modeled partly after work by Basu et al[1] to assess how primary care accessibility relates to public health outcomes, but this study examined the influence of Black representation levels. Specifically, PCPs were defined as the number of non–federally employed physicians, excluding medical residents, actively practicing in the contiguous US, Alaska, and Hawaii

in the outpatient setting in general practice, family medicine, general internal medicine, and general pediatrics. Practice information was acquired from the AMA Physician Masterfile for 3 years (January 1 to December 31 for 2009, 2014, and 2019), and physician race and ethnicity data were retrieved from the Association of American Medical Colleges (AAMC) databases, which compile self-reported information from multiple sources, as described previously.[33,43] The AAMC race and ethnicity data are presented as a single variable with the following categories: American Indian or Alaska Native, Asian or Asian American, Black or African American, Hispanic or Latino (of any race), Native Hawaiian or other Pacific Islander, White, and other; the latter category includes individuals either identifying with more than 1 race and ethnicity descriptor and those with unknown or unclassifiable information on race and ethnicity. County-level population data on race and ethnicity were sourced from the 2009 to 2019 American Community Survey 5-year estimates.[44] Black representation levels in the PCP workforce were measured using the following formula:

$$\text{Community representativeness ratio} = \frac{\left(\frac{\text{No. of Black PCPs in a county}}{\text{All PCPs in a county}}\right)}{\left(\frac{\text{No. of Black individuals in a county}}{\text{All individuals in a county}}\right)}$$

The community representativeness ratio is 1.0 when county-level Black representation levels in the PCP workforce match the proportion of community members identifying as Black. A representativeness ratio greater than or less than 1.0 indicates overrepresentation or underrepresentation of Black individuals in the PCP workforce relative to the community, respectively. This approach to measuring Black representation levels is advantageous because it is insensitive to both population and workforce magnitude, aiding in the comparison of counties of different size, and it is similar to the measure used in a recent publication looking at the racial and ethnic diversity of the health workforce.[45] However, the ratio presented here uses a slightly different denominator—the whole population, rather than the working-age population—as the current study focused on population-level health care access instead of occupational opportunity. Both measures align with how the AAMC defines minority group underrepresentation in medicine and how this topic has been studied previously.[33,46,47]

Outcomes

County-level, age-standardized life expectancy at birth and all-cause mortality rates (primary study outcomes) for 2009, 2014, and 2019 were derived from deidentified death records obtained through a data use agreement with the National Center for Health Statistics, using population counts from the US Census Bureau. Death records report race as a single variable (nonbridged), inclusive of Hispanic or Latino and non-Hispanic or non-Latino ethnicity, following 1997 guidelines from the Office of Management and Budget.[48] Life expectancy and all-cause mortality rates were calculated for entire county populations and county Black populations using an approach aligned with the University of Wisconsin Population Health Institute[49] County Health Rankings and Roadmaps program and using the equations presented in Arias et al.[50] Life expectancy was defined as the estimated mean number of years a person could expect to live (from birth), according to age-specific mortality rates. A measure of the all-cause mortality rate disparity between Black and White individuals was also included as a study outcome variable. This disparity was calculated using the method applied by Benjamins et al[51] to assess relative inequities between Black and White individuals using mortality rate ratios among these populations.

Covariates

Following the example established by prior work, county-level covariates (**Table 1**) included the following: rural or urban designation,[53] percentage living under the poverty threshold,[54] percentage of uninsured individuals,[55] median age,[56] percentage who identified as Hispanic,[56] ratio of men per 100 women,[56] percentage with less than a high school degree,[57] median home value,[58]

unemployment percentage,[59] percentage of Medicare-enrolled individuals,[60] age-adjusted percentage of adult tobacco smokers,[49] percentage of adults with obesity,[49] average daily density of fine particulate matter (air pollution),[49] and number of hospital beds.[61]

Statistical Analysis

This longitudinal analysis examined whether between- and within-county influences of Black PCP representation (as a time-varying covariate) were associated with county-level life expectancy and age-adjusted all-cause mortality rates for Black individuals, after controlling for covariates.[1] Because Basu et al[1] found that alternative geographic levels of study such as primary care service area and hospital referral region showed similar health care–seeking patterns, this study focused solely on county-level analyses. The combined sample comprised 1618 counties identified as having at least 1 Black PCP during 1 or more study time points (ie, 2009, 2014, or 2019) to ensure the use of nonzero representativeness ratios.

Table 1. Characteristics and Covariates With Potential to Confound Measurement of the Association Between PCP Workforce Sufficiency and Life Expectancy or Mortality[a]

Characteristic	Mean (95% CI) 2009	2014	2019	County change, 2009 to 2019[b]
Independent variable				
Black PCP workforce ratio, median (95% CI)[b,c]	0.69 (0.63 to 0.74)	0.77 (0.71 to 0.84)	0.85 (0.80 to 0.92)	0.04 (0.03 to 0.06)
Total physicians per 100 000 population median (95% CI)[b,c]	61.90 (59.74 to 64.14)	61.11 (58.50 to 63.33)	60.19 (57.65 to 62.64)	0.14 (−0.52 to 0.48)
Covariate				
Age, y[d]	38.02 (37.81 to 38.23)	39.37 (39.14 to 39.60)	40.21 (39.97 to 40.44)	2.19 (2.09 to 2.28)
Hispanic population, %[d]	15.97 (15.97 to 15.98)	17.84 (17.84 to 17.85)	18.97 (18.96 to 18.97)	2.99 (2.98 to 3.00)
Sex ratio (men per 100 women), %[d]	96.33 (96.00 to 96.51)	96.54 (96.50 to 96.60)	96.67 (96.66 to 96.68)	0.34 (0.31 to 0.36)
Census rural county population, %[d]	8.51 (8.50 to 8.51)	8.18 (8.18 to 8.19)	8.01 (8.00 to 8.01)	−0.50 (−0.51 to −0.50)
Home value, $[d]	149 006.10 (144 107.10 to 153 905.10)	146 687.10 (142 525.10 to 150 849.2)	171 916.30 (166 643.80 to 177 188.70)	22 910.14 (21 469.96 to 24 350.31)
Poverty rate, %[c]	14.19 (14.18 to 14.19)	15.43 (15.43 to 15.44)	12.21 (12.20 to 12.21)	−1.98 (−1.98 to −1.97)
Uninsured rate for individuals aged <65 y, %[c]	17.22 (17.22 to 17.23)	13.51 (13.50 to 13.51)	10.77 (10.77 to 10.78)	−6.45 (−6.45 to −6.44)
Medicare enrollment, %[d]	NA[e]	NA	21.38 (21.15 to 21.62)	NA
Unemployed rate, %[d]	9.27 (9.27 to 9.28)	6.19 (6.19 to 6.20)	3.65 (3.65 to 3.66)	−5.62 (−5.63 to −5.62)
Less than high school education, %[d]	NA	NA	13.23 (12.96 to 13.50)	NA
Air pollution[d]	NA	NA	8.18 (8.11 to 8.26)	NA
Adult obesity, %[d]	NA	NA	33.83 (33.55 to 34.12)	NA
Adult smoking, %[d]	NA	NA	20.93 (20.73 to 21.13)	NA
No. of hospital beds, median (95% CI)[b,d]	NA	NA	121.50 (110.00 to 138.00)	NA
Dependent outcome variable				
Black life expectancy at birth, age-adjusted, y	76.64 (76.42 to 76.87)	77.06 (76.84 to 77.28)	77.12 (76.89 to 77.35)	1.09 (0.53 to 1.66)
Black age-adjusted mortality	906.19 (874.91 to 937.48)	880.21 (851.36 to 909.06)	868.33 (843.39 to 892.77)	−42.72 (−78.32 to −7.12)
Mortality rate disparity between Black and White individuals, median (range)[b]	1.13 (1.11 to 1.15)	1.11 (1.09 to 1.13)	1.10 (1.08 to 1.12)	−0.01 (−0.03 to 0.00)

Abbreviations: NA, not applicable; PCP, primary care physician.

[a] All independent and dependent variables were reported at the county level for 1618 counties identified as having 1 or more Black PCPs. Counties that did not contain at least 1 Black PCP were not included. County-level age-adjusted life expectancy from birth estimates for Black individuals (based on the subsample of 1618 counties) were slightly higher than national estimates reported by the US Centers for Disease Control and Prevention National Vital Statistics System (NVSS).[52] National life expectancy from birth estimates for Black individuals reported by NVSS was 74.50, 75.60, and 74.80 years for 2009, 2014, and 2019, respectively. The 95% CIs for the median were calculated using the CIQUANTDF option in SAS, version 9.4, to request nonparametric, distribution-free confidence limits for the 50th percentile (median). The 95% CIs for reported percentages (variables denoted with the "%" symbol) were calculated based on binomial proportion tests, which examined whether 2 proportions were equivalent or were statistically significantly different using 95% CIs. The number of physicians per county and the geographic variation in medical costs were both considered for inclusion as covariates but were ultimately excluded from the models because these variables were found to be highly collinear with the number of hospital beds.

[b] Variables where the median is reported instead of the mean as a result of high levels of right skewness. In the analysis, right skewness was addressed through the log-transformation of these variables.

[c] Indicates whether an estimator or study covariate was included in the final mixed-effects regression models as a time-varying covariate using data values from 2009, 2014, and 2019, such that between- and within-county influences for the estimator or study covariate were examined.

[d] Indicates whether a study covariate was included in the final mixed-effects regression models for only 2019.

[e] Cells with NA denote where values were not readily present in 2009 or 2014 for publicly available data sets.

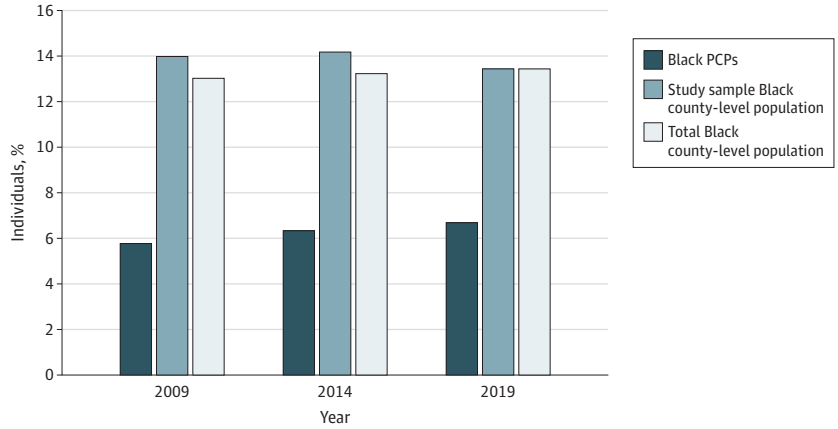
After testing several models for the level 1 residuals (eg, homoscedastic, autoregressive error structure, etc), mixed-effects growth models with an unstructured residual covariance matrix were used (1) to regress life-expectancy, age-adjusted all-cause mortality rates, and a log-transformed measure of mortality rate disparity between Black and White individuals on the log-transformed representativeness ratio within each county and (2) to estimate the between- and within-county components of variation for these outcomes, treating the Black representativeness ratio as a time-varying covariate.[62] The outcome of all-cause mortality rate disparity between Black and White individuals and the aforementioned Black representativeness ratio were log-transformed to reduce positive skewness. To examine whether the associations between Black PCP representation and health outcomes were contingent on county poverty levels as a social determinant of health, moderation analysis assessed the statistical interaction of Black PCP representation with poverty. The association between the total number of PCPs per 100 000 population and each survival outcome also was tested to determine whether differences arose when comparing results for Black PCP representation vs all PCPs. *P* values were 2 sided, with α set to .05 to determine statistical significance. Sensitivity analyses and diagnostics examined (1) whether results met model-based assumptions and (2) if findings remained consistent when extreme residual observations or outliers were removed or when assessing the alternate representation ratio with the corrective constant. All analyses were performed in SAS, version 9.4 (SAS Institute). Data analyses were performed on June 23, 2022.

Results

Black Representation in the PCP Workforce

In this cohort study, Black PCPs comprised 6.3% of the combined sample (present in 1618 counties), and most counties (55.8%) with at least 1 Black PCP were urban. Median representativeness ratios (95% CIs) ranged from 0.69 (0.63 to 0.74) in 2009 to 0.85 (0.80 to 0.92) in 2019, suggesting that Black PCPs tended to be underrepresented relative to the county-level Black population. The percentage of Black PCPs for each time point was 5.7%, 6.3%, and 6.7%, respectively, whereas Black individuals comprised between 13.0% and 13.4% of the total US county-level population from 2009 to 2019 (**Figure 1**). In examining each time point, the number of counties with at least 1 Black physician was 1198, 1260, and 1308 counties in 2009, 2014, and 2019, respectively—consistently less than half of all 3142 Census-defined US counties as of 2014. There was a 9.8% increase in the number of US counties with 1 or more Black PCPs across this period. The percentage of US counties with 1 or more physician (irrespective of race and ethnicity) ranged from 90.9% to 94.2% in 2009, 2014, and 2019.

Figure 1. Percentage of Black Primary Care Physicians (PCPs) vs County-Level Black Population



Across all study years, individuals identifying as Black comprised a smaller percentage of the PCP workforce relative to the study population of 1618 US counties and all 3142 US counties. The total Black county-level population percentage included all counties in the contiguous US, Alaska, and Hawaii.[63]

Association of Black PCP Workforce Representation With Life Expectancy and All-Cause Mortality

Small improvements in age-adjusted life expectancy and mortality rates were seen nationally for Black individuals and for the US population between 2009, 2014, and 2019. Analyses were limited to the subset of 1618 counties with at least 1 Black PCP to ensure the use of nonzero representativeness ratios. In mixed-effects growth models, between-county influences of Black PCP representation indicated that a 10% increase in Black representation levels was associated with higher life expectancy for Black individuals by 30.61 days (95% CI, 19.13 to 42.44 days) ([0.88 × log(1.10)] × 365 = 30.61 days; statistical guidelines were used for interpreting log-transformed estimators in general linear and/or linear mixed models, while multiplying the final value by 365 to convert life expectancy to days based on a standard, 365-day calendar year[64]) and lower all-cause mortality among Black individuals by 12.71 deaths per 100 000 (95% CI, −14.77 to −10.66) (**Table 2**). A 10% higher level of Black representation in the PCP workforce also was associated with an estimated 1.2% lower disparity between Black and White all-cause mortality rates (95% CI, −1.29% to −1.05%), meaning that higher Black representation was associated with smaller mortality differences between Black and White individuals. Additionally, within-county influences

Table 2. Results of Mixed-Effects Regression Models Associating Black PCP Representation and County-Level Covariates With Study Outcomes and Moderation Analysis[a]

Variable	Survival outcome for Black individuals			
	Model 1: life expectancy, y (95% CI)	Model 2: all-cause mortality rate (95% CI)	Model 3: log(mortality rate disparity between Black and White individuals) (95% CI)	Model 4: statistical moderation, life expectancy, y (95% CI)
Log(Black PCP workforce ratio)				
Between counties	0.88 (0.55 to 1.22)	−133.37 (−154.93 to −111.82)	−12.19 (−13.43 to −10.95)	0.59 (0.39 to 0.79)
Within counties	0.04 (−0.21 to 0.30)	−35.34 (−58.86 to −11.81)	−2.44 (−3.65 to −1.23)	0.06 (−0.19 to 0.32)
Interaction of between-counties log(Black PCP workforce ratio) × Poverty rate	NA[b]	NA	NA	0.04 (0.01 to 0.07)
Poverty rate				
Between counties	−0.10 (−0.15 to −0.06)	1.30 (−3.04 to 5.63)	−0.14 (−0.41 to 0.12)	−0.09 (−0.13 to −0.04)
Within counties	0.00 (−0.07 to 0.06)	2.25 (−5.10 to 9.59)	0.16 (−0.20 to 0.52)	−0.00 (−0.06 to 0.06)
Uninsured rate				
Between counties	−0.06 (−0.11 to −0.01)	1.55 (−3.36 to 6.46)	0.14 (−0.16 to 0.44)	−0.06 (−0.11 to −0.01)
Within counties	−0.14 (−0.23 to −0.06)	0.35 (−9.45 to 10.15)	0.05 (−0.42 to 0.52)	−0.14 (−0.22 to −0.05)
Time[c]	−0.23 (−0.52 to 0.06)	−17.57 (−51.43 to 16.29)	−0.03 (−1.65 to 1.59)	−0.22 (−0.51 to 0.07)
Ratio of men per 100 women, %	0.04 (0.02 to 0.06)	−3.88 (−5.65 to −2.10)	−0.21 (−0.32 to −0.11)	0.04 (0.02 to 0.06)
Rural status	1.06 (0.63 to 1.50)	−24.10 (−65.56 to 17.35)	−1.83 (−4.36 to 0.70)	1.06 (0.63 to 1.49)
Home value, $, median (95% CI)	0.02 (−0.00 to 0.04)	0.56 (−1.58 to 2.70)	0.20 (0.07 to 0.34)	0.02 (−0.00 to 0.04)
Hispanic population, %	0.04 (0.02 to 0.06)	−1.12 (−3.26 to 1.02)	−0.02 (−0.15 to 0.11)	0.03 (0.01 to 0.06)
Unemployed rate, %	0.11 (−0.05 to 0.26)	2.01 (−12.67 to 16.68)	0.73 (−0.17 to 1.62)	0.10 (−0.05 to 0.25)
Less than high school education, %	0.03 (−0.03 to 0.09)	0.02 (−5.86 to 5.90)	−0.09 (−0.45 to 0.27)	0.02 (−0.04 to 0.09)
Adult obesity, %	−0.08 (−0.12 to −0.04)	−0.80 (−4.54 to 2.94)	−0.20 (−0.42 to 0.03)	−0.07 (−0.11 to −0.03)
Adult smoking, %	−0.11 (−0.20 to −0.03)	21.45 (12.95 to 29.95)	0.57 (0.05 to 1.09)	−0.13 (−0.22 to −0.04)
Medicare enrollment, %	−0.02 (−0.06 to 0.02)	0.00 (−4.01 to 4.01)	−0.08 (−0.32 to 0.17)	−0.02 (−0.06 to 0.02)
Air pollution	−0.13 (−0.24 to −0.01)	20.74 (9.31 to 32.16)	1.27 (0.57 to 1.98)	−0.13 (−0.24 to −0.01)
Log(No. of hospital beds)	−2.65 (−0.95 to 4.35)	−95.62 (−268.90 to 77.66)	−1.20 (−12.10 to 9.71)	−2.46 (−0.75 to 4.16)

Abbreviations: NA, not applicable; PCP, primary care physician.

[a] Median age was not included as a final study covariate due to issues regarding collinearity and a zero-order Pearson correlation between median age and Medicare enrollment percentage that exceeded 0.85. Unstandardized fixed effects with corresponding 95% CIs for between-county influences reported in Table 2 will neither match previously reported results of a 30.61-day increase in life expectancy, nor match between-county influence results for specified reductions in all-cause mortality and mortality rate disparities between Black and White individuals associated with a 10% increase in the (log-transformed) Black PCP workforce ratio.

[b] Cells with NA denote cases where mixed-effects regression models did not include tests for statistical moderation, such that the interaction between the Black PCP workforce representativeness ratio and county-level poverty rates was not examined.

[c] Time refers to a constructed variable generated such that 2009 was coded as 0, 2014 was coded as 1, and 2019 was coded as 2. This variable was used to assess whether each survival outcome exhibited statistically significant increases or decreases over time.

suggested that during a given year of heightened workforce diversity, counties with higher-than-typical representativeness (relative to their average, underlying level of Black PCP representation) exhibited reduced mortality (−35.34 [95% CI, −58.86 to −11.81]) and a relatively smaller difference in all-cause mortality rates between Black and White individuals (−2.44 [95% CI, −3.65 to −1.23]).

Moderation Analysis

In examining the statistical interaction between Black PCP representation and poverty (0.04 [95% CI, 0.01-0.07]; Table 2), increases stemming from the between-county influence of Black physician representation were associated with enhanced life expectancy among Black individuals across all levels of poverty. Yet enhanced life expectancy was greater among US counties with high poverty, relative to counties with low to average poverty (**Figure 2**).

Association Between Total PCPs and Outcome Measures

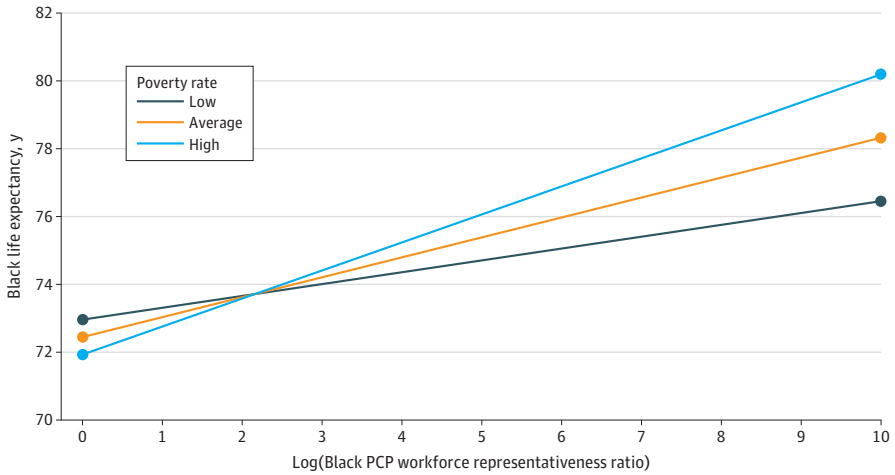
Mixed-effects growth models indicated that after controlling for study covariates, only the within-county influence of the total number of PCPs per 100 000 population was inversely associated with disparities in all-cause mortality rates between Black and White individuals (−1.16 [95% CI, −2.04 to −0.28]; **Table 3**).

Discussion

In this cohort study, moderate workforce diversity gains occurred in the 10-year period from 2009 to 2019, with a 9.8% increase in the number of US counties with 1 or more Black PCPs. In 2019, US Census population estimates reported that more than 70% of all US counties (excluding Puerto Rico) had 1 or more Black residents; however, the results of this study suggested that over half of all US counties had no Black PCPs during each time point. Among the counties that did, Black PCPs tended to be underrepresented relative to the Black county-level population (ie, median representativeness ratios <1.00). Comparatively, the percentage of US counties with 1 or more PCP (irrespective of race and ethnicity) ranged from 90.9% to 94.2% in 2009, 2014, and 2019.

This longitudinal study used multilevel or mixed-effects growth models to examine counties with 1 or more Black PCPs to determine whether increases in Black PCP representation levels were associated with better mortality outcomes among Black individuals. Greater Black PCP representation levels were associated with longer life expectancy and were inversely associated with

Figure 2. Statistical Moderation Analysis: Plot of 2-Way Interaction Between the Log-Transformed Black Primary Care Physician (PCP) Workforce Representativeness Ratio (Between-County Influence) With Poverty Rates (Between-County Influence)



Estimated values (95% CIs) for the simple slopes at low poverty rates (1 SD below the mean), average poverty rates (0 for mean-centered poverty), and high poverty rates (1 SD above the mean) were 0.34 (0.07 to 0.62), 0.59 (0.39 to 0.79), and 0.83 (0.58 to 1.09), respectively. The simple slopes depicting the association between Black PCP representation and life expectancy were statistically significant at each level of poverty (low, average, and high), yet were greater for counties with high poverty (ie, with the simple slope for high poverty being equal to 0.83) compared with those with low or average poverty levels.[65] Further, in terms of percentage increases, these results can be mathematically reformulated to show that a 10% increase in Black PCP workforce representation is associated with an 11.83-day (95% CI, 2.44 to 21.57), 20.53-day (95% CI, 13.57 to 27.48), or 28.87-day (95% CI, 20.18 to 37.92) increase in life expectancy for low, average, and high poverty levels, respectively. This mathematical reformulation is based on standard statistical guidelines for interpreting log-transformed predictors in general linear or linear mixed models.[64]

all-cause mortality rates for Black individuals. Greater representation also was associated with a smaller difference in all-cause mortality rates between Black and White individuals. Moderation analysis suggested that the association between Black PCP representation and life expectancy was greater in counties with high poverty levels compared with counties with low or average poverty levels. Primary care availability, as measured by the total number of PCPs per 100 000 population, did not have a statistically significant association with life expectancy or mortality rates among Black individuals after controlling for other covariates, while within-county influences were associated with a reduced difference in all-cause mortality rates between Black and White individuals. Taken together, these findings suggest that Black PCP workforce representation levels are relevant to and potentially affect Black population health.

This investigation builds on prior work demonstrating the importance of primary care as well as the value of diversity, inclusion, and equity in the PCP workforce. Primary care physicians are a source of continuous, comprehensive care for their patients, serving to prevent and manage disease across the lifespan and coordinating the care provided to their patients elsewhere in the health care system. In addition, PCPs promote patient physical, mental, and general health and well-being; engage patients in actively participating in the management of their own health; often address the broader determinants of health within patients' environment; and work to ensure equitable patient access to necessary health resources.[66,67] Various studies have shown correlations between the higher

Table 3. Results of Mixed-Effects Regression Models Associating Total Primary Care Physicians per 100 000 Population and County-Level Covariates With Study Outcomes[a]

Variable	Survival outcomes for Black individuals, model 5: log(mortality rate disparity between Black and White individuals) (95% CI)
Log(total PCPs per 100 000 population)	
Between counties	0.68 (−0.89 to 2.24)
Within counties	−1.16 (−2.04 to −0.28)
Poverty rate	
Between counties	0.35 (0.01 to 0.70)
Within counties	0.32 (−0.33 to 0.97)
Uninsured rate	
Between counties	0.56 (0.20 to 0.92)
Within counties	0.05 (−0.66 to 0.75)
Time[b]	0.51 (−2.07 to 3.08)
Ratio of men per 100 women, %	−0.22 (−0.34 to −0.10)
Rural status	−14.43 (−17.51 to −11.36)
Home value, $, median (95% CI)	0.72 (0.54 to 0.89)
Hispanic population, %	−0.16 (−0.32 to −0.01)
Unemployed rate, %	0.41 (−0.73 to 1.54)
Less than high school education, %	0.08 (−0.32 to 0.48)
Adult obesity, %	0.46 (0.20 to 0.72)
Adult smoking, %	0.28 (−0.33 to 0.89)
Medicare enrollment, %	−0.19 (−0.49 to 0.11)
Air pollution	7.17 (6.33 to 8.00)
Log(No. of hospital beds)	8.96 (−9.09 to 27.01)

Abbreviation: PCP, primary care physician.

[a] Median age was not included as a final study covariate due to issues regarding collinearity and a zero-order Pearson correlation between median age and Medicare enrollment percentage that exceeded 0.85.

[b] Time refers to a constructed variable generated such that 2009 was coded as 0, 2014 was coded as 1, and 2019 was coded as 2. This variable was used to assess whether each survival outcome exhibited statistically significant increases or decreases over time.

availability of primary care services and desired population health outcomes, such as lower all-cause and cause-specific mortality.[1-11] Racial differences frequently observed in population health outcomes studies are generally considered to result from fixable health system factors, such as differences in the availability and quality of care.[68-70] Race as a study variable, in and of itself, is not considered a biological determinant of health outcomes; rather, it is a social construct that serves as a proxy measure for the structural inequities inherent in our society, and specifically in the health system.[69,70] Empirical evidence shows that individuals belonging to minority racial and ethnic groups experience discrimination within the US health care system that adversely affects their access to, utilization of, experience in receiving, and outcomes from health care services.[17,19,71-73]

Physician-patient race concordance for Black individuals appears to often be associated with improved outcome metrics in some of these arenas, and some Black patients may prefer to seek care from racially concordant physicians due in part to the value placed on certain shared aspects of culture and experience.[23,35,37-39,74,75] Although building a more diverse and representative physician workforce should not be a means to reinforce care segregation or to deemphasize the need to strengthen all physicians' cultural competency, it does broaden patients' choices for selecting PCPs and may offer outcome benefits for Black and other racial and ethnic minority patients.[35,37-39,42] A more diverse workforce in research and leadership roles, able to leverage a wide array of personal and professional experiences in such positions, can additionally aid in shaping more broadly relevant and inclusive research and policy agendas.[28]

However, Black individuals are underrepresented in the majority of health professions that require multiple years of advanced training, including medicine, and numerous barriers limit the entry of Black students into medical careers.[32-34,76-78] Potential interventions to address this include implementing changes in the processes for admissions, hiring, and promotions at universities, such as holistic review, and efforts to better nurture an educational and training environment that is structured for inclusion.[79,80] The Health Resources and Services Administration, the primary federal agency supporting health care delivery to geographically isolated and medically underserved individuals, offers resources to support building an increasingly diverse national health workforce through its Health Careers Opportunity Program, Scholarships for Disadvantaged Students program, and Centers of Excellence program.[32] Efforts to expand structural diversity within the health workforce, meaning to improve the numeric or proportional racial and ethnic mix of practicing PCPs, can be complemented by other strategies. These include strengthening cultural competency curricula and implementing educational approaches that elevate the principles of diversity, equity, and inclusion, such as engaging health professional students and trainees in diverse learning experiences in terms of race and ethnicity and gender (curricular diversity) and providing opportunities for students and trainees to interact with peers from different racial and ethnic backgrounds than themselves (interactional diversity).[81,82] Example programs include Doctors Back to School from the AMA[83] and the Action Collaborative for Black Men in Medicine from the AAMC,[84] in partnership with the National Medical Association.

Limitations

This study has several limitations. Although Basu et al[1] found that health care–seeking patterns were similar across different levels of geography, this study was performed solely at the county level, and people do not necessarily seek primary care solely in their county of residence. Further, geographic proximity to health care is not equivalent to access. Since race and ethnicity was captured as a single variable in the PCP data set used for this analysis, this means that only physicians who self-identified as Black were characterized as such. In addition, life expectancy and mortality are multifactorial concepts, and mortality data categorized using race and ethnicity–based markers do not describe homogenous populations. This study attempted to control for important covariates with potential to confound the results (eg, health insurance access) but additional cultural factors likely play a role, including language and immigration status, although these are difficult to account for with currently available data. The associations identified between Black representation and the

study outcomes do not imply causation. This study also does not investigate whether physician-patient racial concordance is occurring during care delivery. County-level Black representation in the physician workforce may serve as a marker for other community-based and health system factors that affect living environments and health outcomes for Black individuals.

Conclusions

In this longitudinal cohort study of the PCP workforce in US counties where there were Black PCPs, higher levels of Black representation within the physician workforce were observed to be directly associated with longer life expectancy and inversely associated with all-cause mortality rates and all-cause mortality rate disparities for Black individuals. Hence, Black representation levels likely have relevance for population health, supporting the need to expand the structural diversity of the health workforce. Future investigations may examine the likely myriad factors behind this finding, the extent to which physician-patient racial concordance plays a role in this observation, and the effects that efforts to diversify the health workforce ultimately have on population health.

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SUPPLEMENT.

Data Sharing Statement