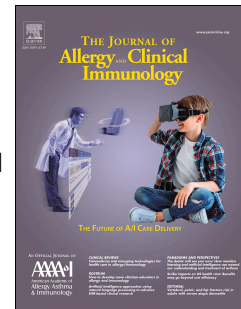


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Underrepresentation of Blacks and Hispanics in Allergy and Immunology training and certification pipeline

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Title: Underrepresentation of Blacks and Hispanics in Allergy and Immunology training and certification pipeline

Short title: Underrepresentation in A/I fellowship and certification

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Diversity and equity in medicine work are essential to equitable high-quality health care delivery. Where the specialty of allergy and immunology stands and where it is headed depends on realistic understanding of the current status and identifying opportunities for improvement. This paper explores the lack of diversity in the allergy and immunology education pipeline and clinical practice in the United States (US).

Serving Diverse Communities: Health care disparities in allergic diseases significantly impacts underserved Black and Hispanic communities. Blacks are at significantly higher risk for asthma and have twice the risk of asthma mortality than whites (mortality rate of 23.9 per million in Blacks versus 9.9 in Whites in 2019).(1) Similar worse outcomes are reported in other atopic diseases such as food allergy.(2)

Increasing the number of specialized physicians from the same racial and ethnic background can improve the trust, reach and access for underserved populations because patients tend to trust a physician with whom they identify. “Workforce diversity ensures a source of physicians who disproportionately care for underserved communities, and serve as advocates for marginalized individuals, which are critical components of achieving health equity,” said Chief Diversity, Equity, and Inclusion Officer William A. McDade, MD, PhD. (3) However, the racial diversity of the US by far surpasses the limited diversity in the medical work force (4, 5). In 2019, Blacks, Hispanics and Native Americans comprised 13.3%, 19.8% and 1.6% of the US population but only 5.0% ,5.8% and 0.3% of practicing physicians, respectively.(5, 6)

Pipeline underrepresentation (medical school, feeder residencies, and allergy and immunology fellowships): The demographics of advanced training programs in the US reflect a persistent underrepresentation of racial minorities.(7) Among 308 Allergy and Immunology fellowship trainees in 2019-2020, 47.5% were White and 20.2% were Asian while only 5.1% and 6.1% were Black and Hispanic, respectively. (3, 7)

Unfortunately, the data are not promising improvement in the near future, and Allergy and Immunology is not unique. A review of 10-year Accreditation Committee for Graduate Medical Education (ACGME) data shows the percentage of Blacks in all fellowships has ranged from a high of 5.4% in 2014 to a low of 1.5% in 2020 and the percentage for Hispanic has ranged from 2.7% to 4.9% during the same time frame.(7) This is a direct result of the disproportionality low numbers of Blacks and Hispanics among medical school graduates. As a result, same low numbers are seen in the Allergy and Immunology feeder residencies of Internal Medicine and Pediatrics. Between 2010 and 2020, only 5.3% and 6.2% of US medical school graduates were Black and Hispanic, respectively. (7) It follows that in the same period, Internal Medicine residency were comprised of 3.9% to 5.1% Blacks and 4.3% to 6.3% Hispanics and Pediatric residency was comprised of 3.8% to 5.1% Blacks and 5.1% to 8.4% Hispanics, respectively.(7)

We reviewed the American Association of Medical Colleges (AAMC) data for number and percentage of applicants and residents in a timeline that started in 2017 when they applied to

Internal Medicine, Pediatrics or combined Internal Medicine/Pediatrics residency programs to 2020 when they finished residency and qualified to apply for fellowship in 2020 (Table1). An alarming issue is the down trending number of individuals of underrepresented minorities from residency applicants to matched residents, to fellowship applicants, and finally to matched fellows (Figure 1). We also see a downward trend for Black and Hispanic medical school applicants, medical school matriculants, and medical school graduates which sounds a growing alarm for years to come (Table 1). This forecasts a malfunctioning and concerning pipeline for training of future allergy and immunology specialists, academicians and leaders.

Underrepresentation in the Allergy and Immunology Workforce: It stands to reason that with a slim pipeline there has been and will be a gross underrepresentation in the workforce. In fact, there is a paucity of data regarding the race and ethnicity of the total allergist and immunologist workforce, including those meeting standards for board certification. The last comprehensive allergy-immunology workforce report published by the American Academy of Allergy and Immunology (AAAAI) in 2012 revealed a marginal increase from 3% underrepresented minorities in 1999 to 5% in 2004, which remained unchanged in 2009.(8)

According to a recent report from the AAMC, if underserved populations had health care use patterns across all specialties similar to populations with fewer access barriers, demand could rise by an additional 74,100 to 145,500 physicians.(9) U.S. 2018 to 2033 growth projections for the non-Hispanic Black population is 13.3% and 31.4% for the Hispanic population. This report highlighted that physician service needs will grow proportionately faster for minority populations. More than 37,000 black non-Hispanic physicians and 41,000 Hispanic physicians will be needed to meet the demand signal.

Data on the demographics of certified physicians nationally and in the specialty of allergy and immunology is lacking. As for many American Board of Medical Specialties member boards, the American Board of Allergy and Immunology (ABAI) intentionally does not capture race and ethnicity data on certification candidates or diplomates. Although the premise of a single high standard for all remains a central component of the board certification community, recent events and research have highlighted the need for purposeful identification of unintentional bias in assessments and certification programs. The Board of Directors of ACGME conducted its first diversity, equity, and inclusion workshop in 2019-2010, focusing on implicit bias and reverse ideation. The event and its programs aimed to identify barriers and challenges to successful production of a diverse medical workforce. (3) ABAI along with other boards are now planning to seek and monitor race and ethnicity for the purpose of eliminating unrecognized bias and increasing opportunities for representational diversity in governance.

Leadership in Allergy and Immunology and its role: In the quest for diversity and inclusion in medicine, strong leadership shapes the vision and path and can remove structural and institutional barriers. If minority physicians are not in leadership positions, training institution vision, mission, budgets, policy and procedures may never embrace racial equity needed to ensure a fully diverse pipeline and workforce.(3) To overcome this burden, physicians of color

need to be trained, mentored, nurtured and promoted when ready to be able to lead the way for future generations.

Data on the racial and ethnical construct of current and future leaders is lacking and represents yet another unmet need. An author inquiry revealed that the AAAAI does not currently track the race and ethnic demographics of the Division Directors Committee or the national Program Directors Assembly co-sponsored by the AAAAI and the American College of Allergy, Asthma and Immunology. In the absence of verifiable self-reported race and ethnicity data, an estimate of the percentage of volunteer ABAI Directors and Committee members from communities of color is historically less than 10-15% (unpublished observation by ABAI leadership).

Advancing the knowledge: One of the problems in combating health care inequity is limited knowledge on what works to achieve racial equity in healthcare. It is an ongoing responsibility of academia to generate this knowledge. Academicians from underrepresented backgrounds serve as catalysts for diversity and disparity of healthcare research. Support and encouragement of such important research in our field entails findings solutions on how to combat underrepresentation within Allergy and Immunology academicians and clinicians.

Structural inequities are tightly embedded in society and consequently in medicine. Lack of diversity in the Allergy and Immunology workforce coupled with deficits in all components of the pipeline is a recipe for continued failure to meet the ever-growing needs of diverse patient populations afflicted with allergic and immunologic disorders. There is a desperate need for diversity and inclusion focused specialty data, recruitment, leader development & outcomes-based research. Leadership matters deeply in such efforts, from culture to finances. Improving outreach, taking a holistic approach to the fellowship program selection process, and focusing on mentorship of underrepresented groups are essential steps to foster diversity. To address this significant underrepresentation, it is essential to start at earlier ages, to create a stronger inflow for the pipeline. This entails exposing underrepresented minorities elementary and middle school students to the biomedical sciences, while encouraging and supporting minority high school students to increase and engage their interest and potential to enter the "pre-med" track in college. Closer collaboration of at-large organizations including the American Academy of Allergy, Asthma and Immunology, and the American College of Allergy, Asthma and Immunology with the National Medical Association and National Hispanic Medical Association as the largest organizations representing African-American and Hispanic health professionals could be an important step to increase the number of minority students entering the physician pipeline. Finally, medical education is expensive, and physicians often start their careers with large debts. Programs designed for financial support of medical students or trainees from underserved underrepresented populations might be necessary in incentivizing physicians from underrepresented minorities to continue advanced medical trainings in subspecialties. This can potentially help their decision to continue with fellowship training after residency instead of starting to practice right away and increase their representation in subspecialties.

Increasing diversity across generations in our specialty is key to advancing our field and fulfilling our mission and goals as educators, researchers and physicians.

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Table 1: Racial and ethnic breakdown of applicants and matched medical students, residents and fellows show a narrowing pipeline with each stage of medical training.

Percentage of individuals in each group	Applicants to IM, pediatrics or IM/pediatrics in 2017	Matched residents to IM, pediatrics or IM/pediatrics in 2017	Applicants to Allergy and Immunology fellowship in 2020	Matched Allergy and Immunology fellows in 2020	Medical school applicants 2019	Medical Students 2020	Medical school graduates 2020
Native American	0.41	0.6	0.00	0	0.5	0.2	0.28
Asian	31.27	21.8	34.09	39.1	20.3	19.2	21.3
Black or African American	9.65	5.5	2.27	2.27	8.4	7.1	6.2
Hispanic	9.23	7.5	7.95	3.3	6.2	6.2	5.3
Native Hawaiian or Other Pacific Islander	0.17	0.2	0.57	0	0.1	0.2	0.1
White	38.75	50.8	45.45	46.7	46.8	49.8	54.6
Other	10.50	11.69	8.52	8.63	17.7	17.4	12.22

Legend: First 4 columns show percentages of each racial/ethnic group in a timeline that started in 2017 when residency applicants applied and matched to residency [internal medicine (IM), pediatrics or combined IM/Pediatrics residency programs] to 2020 when the same group applied and matched to Allergy and Immunology fellowship in 2020. Last 3 columns show racial/ethnic percentages for medical school applicants, medical students and medical school graduates. Data from AAMC reports; 2017-2020. Data on the matched Allergy and Immunology fellows in 2020 is from a survey of Allergy and Immunology program directors conducted by a task force of the Program Directors Assembly.

US Population
(Census 2020)

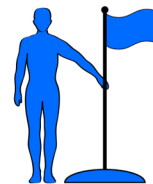
Medical School

IM & Peds
Hospital

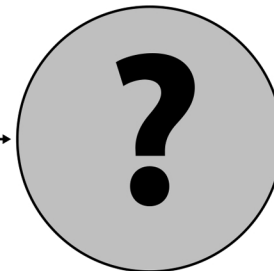
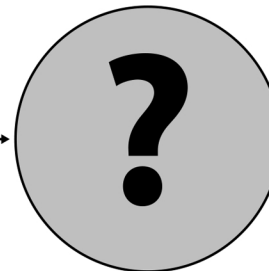
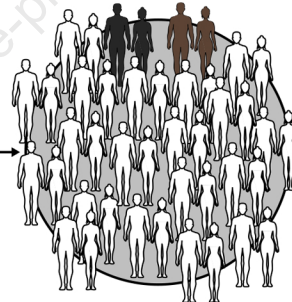
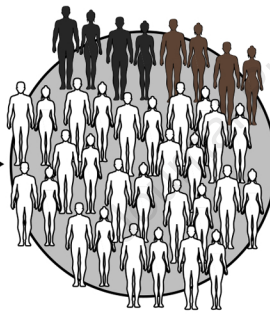
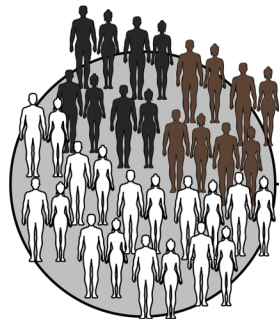
AI Fellowship

Allergy and
Immunology
Practice

Leadership



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Asian:	19.2%
Black or African American:	7.1
Hispanic:	6.2
Native American:	0.2
Native Hawaiian or Other Pacific Islander:	0.2
White:	49.8
Other/Unknown:	17.3

21.8%
5.5
7.5
0.6
0.2
50.8
13.6

39.1%
2.2
3.3
0
0
46.7
8.6