Ophthalmology Departments Remain Among the Least Diverse Clinical Departments at US Medical Schools

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Abstract

Objective: The current demographics of the physician workforce, including ophthalmologists, do not reflect the diverse US population, which has implications for addressing health disparities in the US. The demographics of ophthalmology department faculty may influence the recruitment of under-represented students into the field of ophthalmology. This study sought to determine how the racial/ethnic demographics of ophthalmology department faculty compare to other clinical departments at US medical schools.

Design: Secondary data analysis of medical school faculty demographic data from the 2019 American Association of Medical Colleges Faculty Roster.

Participants: Clinical faculty and department chairpersons at US Medical Schools.

Methods: We analyzed the racial/ethnic demographics of clinical department faculty and department chairpersons using data from the 2019 American Association of Medical Colleges Faculty Roster. We calculated the proportion of under-represented minority (URM) faculty in ophthalmology and in 17 other individual clinical departments. We analyzed these data for statistically-significant differences between ophthalmology and other clinical departments. In addition, we compared the percentage of URM physicians among ophthalmology faculty to the proportion of URM persons among graduating US medical students and in the US population using data from the Medical School Graduation Questionnaire and the US census respectively.

Main measures: The proportion of URM persons, defined as Black, Hispanic/Latino, Native American, or Native Hawaiian/Pacific Islander among clinical faculty and department chairs.

Results: Ophthalmology faculty at US medical schools are less racially/ethnically diverse than graduating US medical students and the general US population. When compared to 17 other clinical departments, ophthalmology has the third-lowest proportion of URM faculty, with only radiology and orthopedic surgery having a smaller proportion of URM faculty. These differences
were statistically significant in the majority of departments evaluated (12 out of 18). There was no statistically-significant difference in the proportion of URM department chairs in ophthalmology compared to most other clinical departments, though the absolute number of URM department chairs in ophthalmology is low at only 8 chairpersons.

**Conclusions:** More work must be done to increase the recruitment of URM physicians into ophthalmology faculty positions to obtain parity with other clinical departments and with the diverse patient population that physicians serve.
Background

The United States population is rapidly diversifying, with minority populations comprising 38% of the population in 2014 and expected to exceed 50% by 2044 according to the U.S. census bureau.\(^1\) Despite these population changes, the physician workforce has remained less diverse, with only 12% of U.S. MD physicians being under-represented minorities (URM) in medicine, defined as Black, Hispanic/Latino, Native American, and Native Hawaiian/Pacific Islander.\(^2\) Creating a physician workforce that reflects the diverse patient population in its care is a just and equitable goal in its own right, but also has implications for health disparities in the U.S. as URM physicians are more likely to work in impoverished areas and areas federally designated as medically underserved.\(^3,4\) Additionally, patients who see physicians of their own ethnicity rate their physicians as more likely to engage them in participatory decision-making about treatment choices.\(^5\) A diverse physician workforce would provide patients with access to diverse physicians, improve cross-cultural communication and would lead to more patient involvement in care, higher levels of patient satisfaction, and better health outcomes.\(^5\)

The disparities in representation of Black, Hispanic/Latino, and Native American physicians extend to the field of ophthalmology as well. In 2015, Xierali et al. reported that only 6% of ophthalmologists with direct patient care were URM physicians.\(^6\) This percentage increased to 7.2% when examining physicians who graduated in 1980 or later, and to 7.7% when examining the number of URM ophthalmology residents in 2014.\(^6\) There was no significant change in the percentage of URM ophthalmology residents in the decade from 2005 to 2014, with the number of Hispanic/Latino and Native American residents remaining relatively unchanged, and the number of Black residents decreasing slightly.\(^6\) According to data from the Association of University Professors of Ophthalmology, the percentage of URM applicants matching into ophthalmology ranged from 4.9% to 10.8% from 2016 to 2019, with an average of 8.4%. These applicants consisted only of Black or Hispanic/Latino candidates, as no Native Americans or Native Hawaiian/Pacific Islanders participated during those years.\(^7\) Currently,
URM physicians are on average more likely to practice in primary care than white physicians, and almost a quarter of Native American physicians in particular practice in family medicine. The significant racial/ethnic disparities in vision health and access to eye care provide one reason why ensuring a diverse workforce should be a priority to the field of ophthalmology. In this study we analyze the most recent available data on the racial/ethnic composition of ophthalmology faculty at US medical schools and compare it to the demographics of other clinical departments, to the demographics of graduating medical students, and to the US population.
Methods

We obtained demographic data regarding ophthalmology faculty and other department faculty from the annual report “U.S. Medical School Faculty,” a set of data tables released by the American Association of Medical Colleges (AAMC). This annual data report is based on the AAMC Faculty Roster, a comprehensive database of the demographic, education, and employment characteristics of faculty members at accredited U.S. MD-granting medical schools. The roster was started in 1966 and contains records on approximately 176,000 active faculty and 300,000 inactive faculty. Participation in the database by medical schools is voluntary. Participating schools identify faculty roster representatives who submit data to the roster annually.

We defined underrepresented minorities (URM) as persons listed under American Indian or Alaskan Native; Black or African American; Hispanic, Latino, or of Spanish origin; Native Hawaiian or other Pacific Islander; and Multiple races – Hispanic/Latino (those who are reported as Hispanic/Latino and at least one other race). Those listed as White, Asian, multiple races– non-Hispanic/Latino, other, and unknown were considered non-URM. The categories of Multiple race– Hispanic/Latino and Multiple races– non-Hispanic/Latino allow for unduplicated counts of faculty, as Hispanic/Latino is often recorded as an ethnic category in addition to race. The faculty roster dataset reports faculty data for 18 department “classifications” in the clinical sciences so that disparately named but similar departments across medical schools can be evaluated as one. For example, neurosurgery and cardiac surgery are included together under the surgery department classification.

Using racial/ethnic demographic data from the 2019 AAMC Faculty Roster, we calculated the proportion of URM faculty members in the 18 available clinical department classifications, which included ophthalmology. The 2019 faculty report excluded 63 faculty across all departments and 3 chairs due to missing data about gender. We compared the racial/ethnic composition of faculty across clinical departments using the "N-1" Chi-squared test.
as recommended by Campbell (2007) and Richardson (2011)\textsuperscript{14,15} using MedCalc statistical software (MedCalc Software). P < 0.05 was considered to be statistically significant. In addition, we compared faculty racial/ethnic composition to the composition of graduating U.S. medical students in 2019 based on the Medical School Graduation Questionnaire, an annual survey administered to all graduating U.S. medical students.\textsuperscript{16} Faculty composition was also compared to the U.S. population using data from U.S. Census Bureau American Community Survey 2018.\textsuperscript{17}
Results

In 2019, there were 157,993 clinical faculty members reported across 18 department classifications. Of these, 3,060 were ophthalmology faculty. Table 1 shows a summary of ophthalmology faculty members by reported race/ethnicity. Of the 3,060 faculty, 208 (6.8%) are reported as URM. For each racial category with URM, there are wide discrepancies between their representation among ophthalmology faculty and their representation in graduating medical students and the general U.S. population. Black physicians represented only 2.3% of ophthalmology faculty despite representing 6.7% of graduating medical students and 12.7% of the population. Physicians who identified as Hispanic/Latino alone represented 2.3% of ophthalmology faculty, 8.6% of graduating medical students, and 18.3% of the population. With only 1 Native American faculty member in ophthalmology reported, American Indian/Alaska Native physicians represent 0.03% of ophthalmology faculty, 0.9% of graduating medical students, and 0.9% of the population. Examining the demographics of ophthalmology department chairs revealed a lower representation of URM physicians than in ophthalmology faculty. Of the 106 ophthalmology department chairs reported in this database, 81.1% of chairs are white and 11.3% are Asian. There were 4 black, 4 Hispanic/Latino, and zero Native American or Pacific Islander chairs.

Examining the demographics of the 18 clinical departments as a whole reveals that 15,559 (9.8%) of the 157,993 clinical faculty in 2019 were URM, significantly higher than the 6.8% of ophthalmology faculty that were URM physicians (P<0.01) (Figure 1). When ophthalmology faculty demographics are compared against the other 17 clinical departments, ophthalmology is the third lowest in terms of percentage of URM faculty, above only radiology (6.7%) and orthopedic surgery (6.1%) (Figure 1). Otolaryngology, often considered a comparable specialty to ophthalmology given that it is also a relatively small surgical subspecialty, had a higher percentage of URM faculty than ophthalmology with 7.2% URM faculty, but this difference was not statistically significant (P = 0.5). URM physicians represented
a statistically significant (P <0.01) smaller portion of ophthalmology faculty compared to pediatric (11.1%), internal medicine (9.8%), and surgery faculty (9.3%). The departments with the highest percentages of URM faculty were obstetrics & gynecology (15.7%), public health & preventative medicine (14.3%), and family practice (13.2%), and these proportions were statistically significant in comparison to ophthalmology.

Examining the demographics of the 2398 department chairs in US medical schools across the 18 clinical departments shows that 9.3% of chairs are URM physicians (Figure 2), which closely mirrors the 9.6% of clinical faculty who are URM physicians. Among ophthalmology department chairs, only 7.5% are URM physicians, but this did not represent a statistically significant difference from percentage of total department chairs. In fact, only one department, family practice, had a statistically significant difference in percentage of URM department chairs when compared to ophthalmology, with 16.8% of family practice chairs being URM physicians.
In 2009, the Liaison Committee on Medical Education (LCME) adopted accreditation guidelines that require medical schools to make efforts to increase the accessibility of medical education to students from diverse backgrounds. The proportion of Black, Hispanic/Latino, and Native American students among medical school matriculants has been increasing, but these groups remain underrepresented when compared to the growing US population and this representation has not significantly changed in the past 10 years. Meanwhile, the diversity of medical school faculty has been increasing but has not kept pace with the diversifying medical student body nor the US population. Disparities exist in the advancement of URM faculty in academic medicine, with URM faculty advancing at lower and slower rates. Previous studies also show lower career satisfaction among URM faculty at academic medical centers. The dearth of URM faculty has implications for URM medical students for whom faculty mentorship may play an important role in their success in medical school. Creating a diverse faculty body in the field of ophthalmology may improve further recruitment of URM students into the field.

In this study, we found that Black, Hispanic/Latino, Native American, and Native Hawaiian/Pacific Islander physicians remain under-represented among ophthalmology faculty relative to their representation in the general population and U.S. medical school graduates, and relative to other many other clinical departments. Ophthalmology faculty were the third-least diverse in terms of URM faculty among the 18 clinical departments analyzed. These results emphasize the need for more efforts to recruit under-represented minorities to the field of ophthalmology. While recent match data suggest a slight increase in URM applicants in ophthalmology in the past 3 years, longer term studies have not shown any significant increase in URM ophthalmology residents in the past decade, despite an increasingly diverse group of medical school graduates from which to draw. A diverse physician workforce has implications for patient satisfaction and outcomes. Multiple studies have shown that African Americans and other minority patients often receive
differential and less optimal technical health care than white Americans.\textsuperscript{26–28} Improving diversity in the ophthalmology workforce may improve cross-cultural communication, lead to higher quality of care, more patient involvement in care, adherence to treatment and better outcomes.\textsuperscript{5}

In 2016, the American Academy of Ophthalmology established the Minority Ophthalmology Mentoring program, dedicated to helping URM medical students become competitive ophthalmology residency applicants. Students participating in the program are paired with a faculty mentor, participate in programming at the AAO annual conference, and receive USMLE preparatory materials. By 2019, over 50 students had participated, and the program continues to grow in popularity and gain support from industry partners and professional societies.\textsuperscript{29,30} It remains to be seen what long-term effect this program will have on the number of URM ophthalmology applicants, but data shows that participation in the program increased students’ interest in pursuing careers in ophthalmology.\textsuperscript{30} Additional programs from the National Medical Association such as the long-standing Rabb-Venable Excellence in Ophthalmology Research program, founded in 2000, have also served an important role to nurture URM trainees.

Beyond mentoring URM trainees, Aguwa et al. further outlines efforts that must be made at all levels to diversify the ophthalmology workforce, ranging from unbiased promotion practices, cultural competency training, and involving more URM faculty in the medical school and residency application processes.\textsuperscript{31} Efforts to increase diversity should be collaborative between both minority-specific organizations and larger organizations which should make strong commitments to increasing diversity.

Some limitations of this study are that people who identify as multiple races are reported in aggregate, which may obscure nuances in the data. For example, approximately half of the Native Americans in the U.S. identify as Native American and another race.\textsuperscript{32} Reporting multiracial people in aggregate may therefore underestimate the number of Native Americans. This is an important issue to consider in the reporting of racial/ethnic data as the population of
multiracial Americans continues to grow.\textsuperscript{33} Additionally, data was obtained from multiple sources so there could be minor discrepancies, but reflect the most accurate information available. Working towards an ophthalmology workforce that reflects the diverse U.S. population is an important goal and may be part of the solution in addressing vision health disparities in the U.S. It is a challenging and important task that the field of ophthalmology must prioritize.
References


Figure 1. Percentage of URM faculty in clinical departments at US medical schools, with the absolute proportion listed in parenthesis. * Indicates a statistically significant difference in the percentage of URM faculty in a department when compared to ophthalmology, p < 0.05. Ophthalmology is highlighted in red for emphasis.

Figure 2. Percentage of URM physicians holding clinical department chairs in 2019, with the absolute proportion listed in parenthesis. * Indicates a statistically significant difference in the percentage of URM department chairs when compared to ophthalmology department chairs, p < 0.05. Ophthalmology is highlighted in red for emphasis.
Ophthalmology department faculty at US medical schools are significantly less diverse than most other clinical departments in regards to the proportion of under-represented minority physicians, ranking the third-lowest of 18 departments analyzed.
<table>
<thead>
<tr>
<th>Discipline</th>
<th>Faculty Size</th>
<th>Total Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Faculty</td>
<td>15,559</td>
<td>179,280</td>
</tr>
<tr>
<td>Obstetrics &amp; Gynecology</td>
<td>1,017</td>
<td>11,902</td>
</tr>
<tr>
<td>Public Health &amp; Preventive Medicine</td>
<td>6,468</td>
<td>72,651</td>
</tr>
<tr>
<td>Family Practice</td>
<td>119</td>
<td>1,323</td>
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<tr>
<td>Other Clinical Sciences</td>
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<td>3,832</td>
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<tr>
<td>Pediatrics</td>
<td>2,625</td>
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<td>Emergency Medicine</td>
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<td>6,572</td>
</tr>
<tr>
<td>Psychiatry</td>
<td>1,117</td>
<td>12,788</td>
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<tr>
<td>Anesthesiology</td>
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<td>Internal Medicine</td>
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<tr>
<td>Physical Medicine &amp; Rehabilitation</td>
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<tr>
<td>Surgery</td>
<td>1,507</td>
<td>17,527</td>
</tr>
<tr>
<td>Neurology</td>
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<td>5,876</td>
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<tr>
<td>Dermatology</td>
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<td>1,384</td>
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<tr>
<td>Pathology (Clinical)</td>
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<td>3,853</td>
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<tr>
<td>Otolaryngology</td>
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<td>1,880</td>
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<tr>
<td>Ophthalmology</td>
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<td>2,406</td>
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<td>Radiology</td>
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<td>7,995</td>
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<tr>
<td>Orthopedic Surgery</td>
<td>250</td>
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<tr>
<td>Racial/Ethnic Group</td>
<td>Percentage of Ophthalmology Faculty (number)a</td>
<td>Percentage of Ophthalmology Department Chairs (number)a</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>---------------------------------------------</td>
<td>--------------------------------------------------------</td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td>0.03 (1)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Asian</td>
<td>27.6 (846)</td>
<td>11.3 (12)</td>
</tr>
<tr>
<td>Black or African American</td>
<td>2.3 (70)</td>
<td>3.8 (4)</td>
</tr>
<tr>
<td>Hispanic, Latino, or of Spanish origin</td>
<td>2.3 (71)</td>
<td>3.8 (4)</td>
</tr>
<tr>
<td>Native Hawaiian or other Pacific Islander</td>
<td>0.07 (2)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>White</td>
<td>60.3 (1844)</td>
<td>81.1 (86)</td>
</tr>
<tr>
<td>Multiples races</td>
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<td></td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>2.1 (64)</td>
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<tr>
<td>Non-Hispanic/Latino</td>
<td>1.9 (59)</td>
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<td>Other</td>
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<tr>
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<td>0 (0)</td>
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<tr>
<td>Total URM*</td>
<td>6.8 (208)</td>
<td>7.6 (8)</td>
</tr>
<tr>
<td>Total</td>
<td>(3060)</td>
<td>(106)</td>
</tr>
</tbody>
</table>

Table 1: Ophthalmology faculty numbers by race/ethnicity

*total URM refers to sum of Black, Hispanic/Latino, American Indian, Native Hawaiian, and Multiple race – Hispanic.

a AAMC faculty roster 2019
b Medical School Graduation Questionnaire 2019, percentages may not sum to 100% as multiple responses were allowed.
c U.S. Census American Community Survey 2018