

Highlighting Disparities within Ophthalmology and Strategies for Mitigation

Olufemi E Adams, M.D.¹, Olufunmilola Adeleye M.B.A.², Kristine M Nachbor, M.S.¹, Mildred MG Olivier, M.D.³

¹University of Minnesota, ²Mayo Clinic Alix School of Medicine, ³Ponce Health Sciences University

Introduction

- Black and African Americans make up about 13% of the U.S. population but only 5% of physicians. Among these, only 2.5% of ophthalmology residents identify as Black.

- The inequities of healthcare are pervasive in ophthalmology in both access to care and clinical outcomes in various aspects of ophthalmology.

- Our project was multifaceted in nature and focused on the efforts taken at the University of Minnesota in promoting education and awareness of the racial disparities which exists within ophthalmology and discuss strategies for mitigation.

- Structural racism and its impact on healthcare delivery and outcomes was discussed with this project by highlighting the racial demographics within ophthalmology, presenting data on clinical outcomes in the setting of healthcare disparities, and discussing the work being performed to mitigate these at the national level.

Methodology

Study Design

- This was a single center project highlighting the specific details of the work presented at the University of Minnesota department of ophthalmology and visual neurosciences during a Grand Rounds talk.

- We (OA and MG) presented a real-world case of a patient in which their ophthalmic clinical outcome was affected in part due to a specific race-related disparity.

- Furthermore, specific instances of racial disparities within the literature were reviewed and data was presented on these. We focused on the fields of cataracts surgery, glaucoma, cornea and retina.

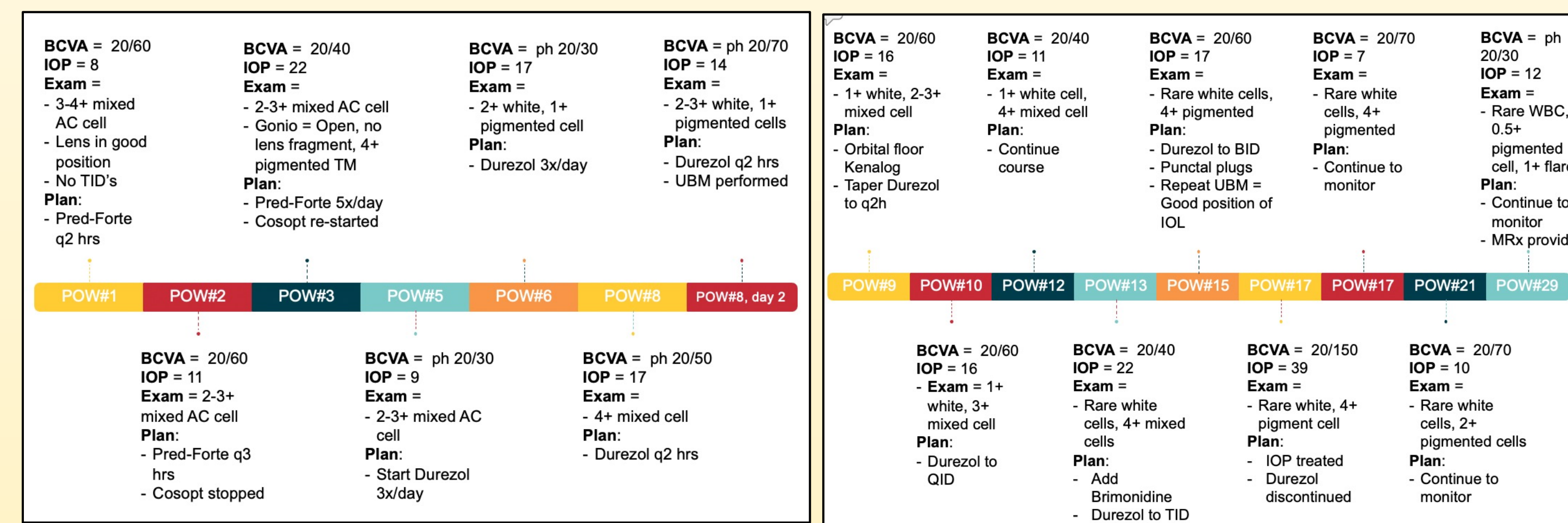
- We also presented demographic data both within the department, highlighting previous University of Minnesota trainees who were identified as black, and detailed the current demographics of current trainees and practicing ophthalmologists nationwide.

- Additionally, we highlighted programs presented by the American Academy of Ophthalmology which focuses on fostering and promoting a more diverse work field.

Results

Case Presentation

- A 76-year-old African American male underwent uncomplicated cataract surgery of which the post-operative course was complicated by persistent anterior uveitis (PAU).
- African Americans are more likely to develop PAU than whites (RR, 11.3; 95% CI, 6.4-20.2; P < 0.0001)*



Cataract Surgery

- Cataracts are the leading cause of blindness worldwide.
- Data from the National Health and Nutritional Examination Survey asked "Have you ever had a cataract operation".
- Results – Prevalence of Cataract Surgery:**
 - Non-Hispanic Whites: 19.3% (NHANES III), 18.4% (NHANES)
 - Non-Hispanic Blacks: 16.4% (NHANES III), 13.5% (NHANES)
 - $P = 0.018$ (NHANES III), <0.001 (NHANES)
- A Retrospective Cohort study within the U.S. Medicare System and the Veterans Health Administration (VHA) patient population was conducted. The study examined the rate of undergoing cataract surgery at 1 and 5 years after a diagnosis of cataracts.
- Results – At 5 years, black vs white race was associated with a decreased odds of undergoing cataract surgery**
 - Medicare: OR, 0.79 [95% CI, 0.78-0.81]
 - VHA: OR, 0.75 [95% CI, 0.73-0.76]
- The Baltimore Eye Survey identified that *the age-adjusted risk of unoperated senile cataracts causing blindness in black individuals was 5.25x compared to white individuals*

Glaucoma

- African Americans are 4-5x more likely to develop primary open angle glaucoma compared to White Americans, and 6.6x more likely to be blind from glaucoma.
- A retrospective Longitudinal study compared patients in Medicaid vs a large U.S. managed care network and explored the proportion of patients who underwent glaucoma testing within the first 15 months of a new diagnosis.
- Results:**
 - Medicaid patients (n = 3394), Commercial Health Insurance (n = 18,372).
 - Medicaid Patients had a 67% decrease odd (OR – 0.33, 95% CI: 0.31 – 0.36), (35%) of undergoing visual field testing compared to commercial insured group (63%).
 - White patients had a 63% decreased odd (OR = 0.37, CI:0.33-0.42)
 - Black patients had a 73% decreased odd (OR = 0.27, CI:0.23-0.31)
 - Hispanic patients had a 52% decreased odd (OR = 0.48, CI:0.37-0.61).

- The American Academy of Ophthalmology sponsors several programs aimed at mitigating these disparities



Cornea

- Corneal tissue is the most common tissue transplanted in the U.S.
- African Americans have a higher risk of graft failure as highlighted in several studies:

Penetrating Keratoplasty Outcome Disparity Primary Studies:

Price et al, 2003	2.4 (RR) (1.5-3.8), (p <0.001)
Sugar et al, 2009	2.6 (1.60-4.22), (p <0.001)
Niziol et al, 2013	4.95 (HR) (1.49016.39), (p = 0.0089)
Sugar et al, 2015	2.1 (1.1-4.1), (p = 0.002)

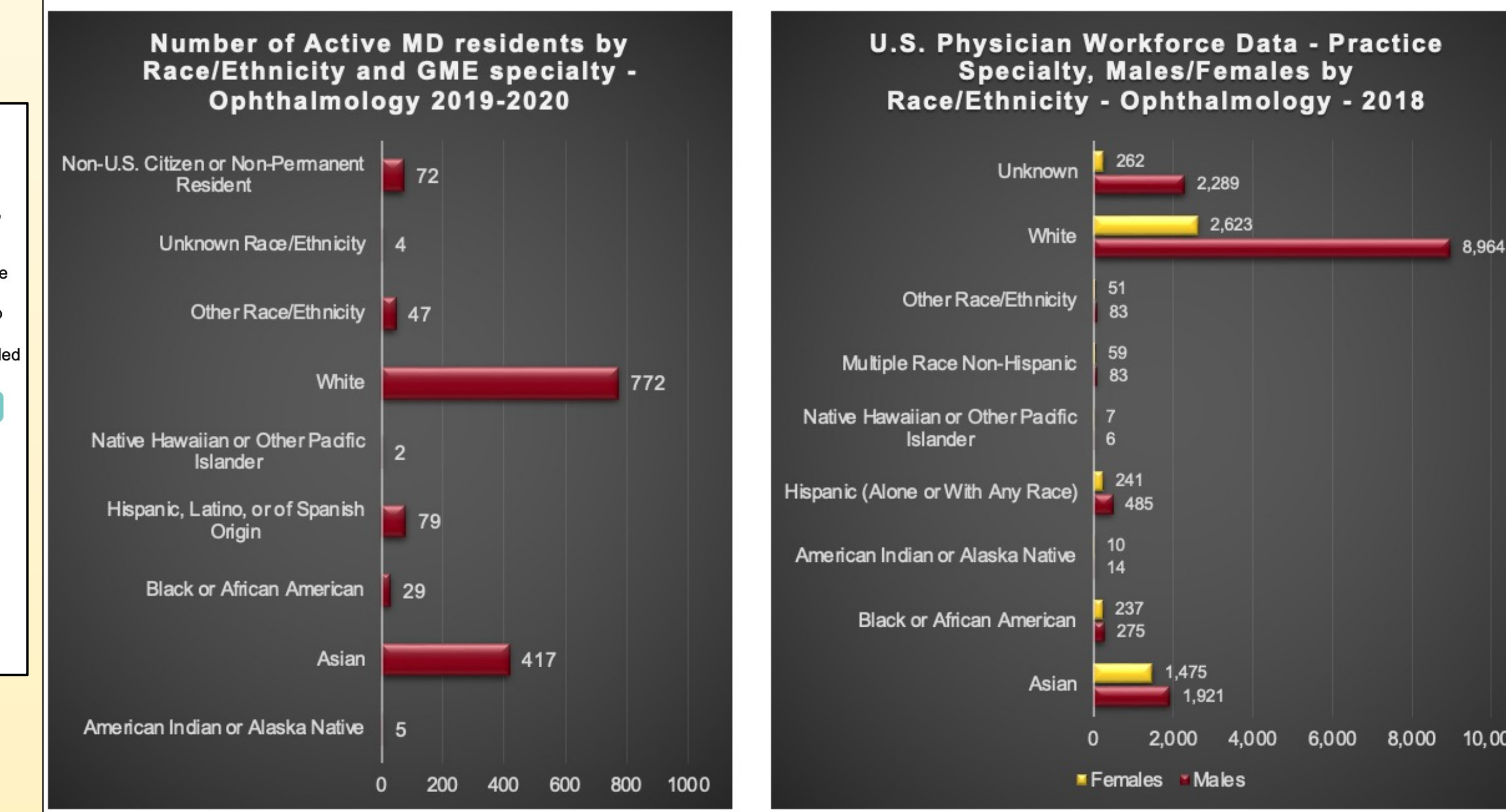
Retina

- Diabetic Retinopathy is the leading cause of new onset blindness in working age Americans.
 - African Americans are less likely to receive an eye examination compared to non-Hispanic whites.
 - Hispanic patients are less likely to have screening tests for diabetes.
- The veterans Affairs Diabetes Trial identified the prevalence of diabetic retinopathy with scores of >40 (as designated by the ETDRS study).
 - Hispanic (36%) – difference compared to non-Hispanic whites, p <0.05
 - African Americans (29%) – difference compared to non-Hispanic whites, p <0.05
- These differences were not explained by age, duration of diagnosed diabetes, A1c or other factors*



Minority Ophthalmology Mentoring (MOM)

Demographics in Ophthalmology



Discussion

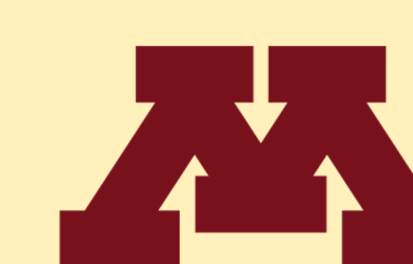
With the degree of racial disparities that exist within ophthalmology it is imperative to focus on strategies to mitigate these including focusing on recruitment for a more diverse, representative work-force, and educating trainees and practitioners of specific disparities which may affect the clinical outcomes of specific patient populations.

Acknowledgements

- All authors have no relevant financial disclosures
- No funding or grant support was provided for this project
- All authors attest that they meet the current ICJME guidelines for Authorship.

References

- Riley WJ. Health disparities: gaps in access, quality and affordability of medical care. *Trans Am Clin Climatol Assoc.* 2012;123:167-174. <https://www.meritryhealth.com/assets/pdf/checked/1/ANNIVERSARY.pdf>
- Reddy AK, Patnaik JL, Miller DC, Lynch AM, Palestine AG, Pantcheva MB. Risk Factors Associated with Persistent Anterior Uveitis after Cataract Surgery. *Am J Ophthalmol.* 2019 Oct;208:62-68. doi: 10.1016/j.ajo.2019.02.016. Epub 2019 Feb 19. PMID: 30794788.
- Neatrou K, McAlpine A, Owens TB, Trivedi RH, Poole Perry LJ. Evaluation of the etiology of persistent iritis after cataract surgery. *J Ophthalmic Inflamm Infect.* 2019;9(1):4. Published 2019 Feb 18. doi:10.1186/s12345-019-0172-2
- Shahbazi S, Stuchnick J, Warner-Hillard CW. A Cross-Sectional Retrospective Analysis of the Racial and Geographic Variations in Cataract Surgery. *PLoS One.* 2015;10(11):e0142459. Published 2015 Nov 5. doi:10.1371/journal.pone.0142459
- Zhang X, Colch MF, Ryskulova A, et al. Vision health disparities in the United States by race/ethnicity, education, and economic status: findings from two nationally representative surveys. *Am J Ophthalmol.* 2012;154(6 Suppl):S53-62.e1. doi: 10.1016/j.ajo.2011.08.045
- Wu AM, Wu CM, Tseng VL, et al. Characteristics Associated With Receiving Cataract Surgery in the US Medicare and Veterans Health Administration Populations. *JAMA Ophthalmol.* 2018;136(7):738-745. doi:10.1001/jamaophthalmol.2018.1361
- Sommer A, Tielisch JM, Katz J, Quigley HA, Gottsch JD, Javitt JC, Martone JF, Royall RM, Witt KA, Ezrin S. Racial differences in the cause-specific prevalence of blindness in east Baltimore. *N Engl J Med.* 1991 Nov 14;325(20):1412-7. doi: 10.1056/NEJM199111143252004. PMID: 1922252.
- Friedman DS, Wolfs RC, O'Colmain BJ, Klein BE, Taylor HR, West S, Leske MC, Mitchell P, Congdon N, Kempen J. Eye Diseases Prevalence Research Group. Prevalence of open-angle glaucoma among adults in the United States. *Arch Ophthalmol.* 2004 Apr;122(4):532-8. doi: 10.1093/ajophthalmol.2004.122.4.532
- Tielisch JM, Sommer A, Katz J, Royall RM, Quigley HA, Javitt J. Racial variations in the prevalence of primary open-angle glaucoma. The Baltimore Eye Survey. *JAMA.* 1991 Jul 17;266(3):369-74. PMID: 2056646.
- Elam AR, Andrews C, Musch DC, Lee PP, Stein JD. Large Disparities in Receipt of Glaucoma Care between Enrollees in Medicaid and Those with Commercial Health Insurance. *Ophthalmology.* 2017;124(10):1442-1448. doi:10.1016/j.ophtha.2017.05.003
- Muir KW, Alder B, Thomas A, Crowell SS, Stinnett SS, Lee PP. Trust in the provider and glaucoma-related blindness. *ISRN Ophthalmol.* 2012 Jun 20;2012:393917. doi: 10.5402/2012/393917. PMID: 24555127; PMCID: PMC3912570.
- Ling JD, Mehta V, Fathy C, Rapoport Y, Zhang MM, Daniels A, Kohanim S. Racial Disparities in Corneal Transplantation Rates, Complications, and Outcomes. *Semin Ophthalmol.* 2016;31(4):337-44. doi: 10.3109/08820538.2016.1154162. Epub 2016 Apr 19. PMID: 27092728.
- Fathy C, Patel S, Sternberg P Jr, Kohanim S. Disparities in Adherence to Screening Guidelines for Diabetic Retinopathy in the United States: A Comprehensive Review and Guide for Future Directions. *Semin Ophthalmol.* 2016;31(4):364-77. doi: 10.3109/08820538.2016.1154170. Epub 2016 Apr 26. PMID: 27116205.
- Emanuel N, Sacks J, Klein R, Reda D, Anderson R, Duckworth W, Abiraju C, Veterans Affairs Diabetes Trial Group. Ethnicity, race, and baseline retinopathy correlates in the veterans affairs diabetes trial. *Diabetes Care.* 2005 Aug;28(8):1954-8. doi: 10.2337/diacare.28.8.1954. PMID: 16043738. <https://www.aamc.org/data-reports/students-residents/interactive-data-report-residents/2020/table-b5-md-residents-race-ethnicity-and-specialty>
- <https://www.aamc.org/data-reports/workforce/data-table-1-2-practice-specialty-females-race-ethnicity-2018>



UNIVERSITY OF MINNESOTA
Driven to Discover®