

Recent Trends in the Effect of Race and Gender on the Orthopaedics Match

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INTRODUCTION: Orthopaedic surgery traditionally has had a reputation for being a competitive specialty that is less accessible to women and racial minorities. Considering the recent spotlight on diversity and its merits in patient care, orthopaedics has been facing increased scrutiny from the medical community for its relative lack of diversity. Such pressure has prompted leaders of the orthopaedics community to make efforts to increase participation of women and minorities in the field by means such as raising awareness and pipeline programs. We aim to explore the trends of the risk of not matching, comparing proportions of women and minorities in the applicant pools versus proportions in residency programs.

METHODS: The study was IRB exempt. The authors collected ACGME data books for years 2015-2016 to 2021-2022 to obtain demographic information of orthopaedic residents in training during each of those academic year. The pool of corresponding applicants (for example: residents in training during the 2021-2022 academic year would consist of five classes, made up of applicants from 2016-2017 through 2020-2021) was then tabulated from ERAS statistics which are publicly available on the AAMC website. The race and gender composition of the applicant pool was compared to that of corresponding enrolled residents to calculate the relative risk of not matching of women compared to men, racial minorities (Blacks, Hispanics, Asians, Native Americans) compared to Whites.

RESULTS: For all applicants to orthopaedics in 2010-2011 to 2014-2015, when compared to the gender make-up of residents in training during the 2015-2016 year, women were more likely to match when compared to men (RR 0.83 [95% CI 0.76 to 0.89]; $p < 0.001$, Table 1). This was reversed for residents in training in 2020-2021, when women were had a greater risk of not matching (RR 1.08 [1.004 to 1.15]; $p = 0.038$). All racial minority groups had a higher risk of not matching compared to White applicants for all cycles, peaking for residents in training in 2020-2021 (Table 2, Figure). The trendline improved for residents in the following year.

DISCUSSION AND CONCLUSION: Racial minorities were increasingly less likely to match into orthopaedics relative to White applicants until 2021. In 2021 there was an improvement in this trend for all studied racial minorities despite their continued disadvantage compared to White applicants. Although the exact explanation for this phenomenon is unclear, it is possibly affected by the 2020-2021 application-match being the first cycle when the audition and interview process was done almost entirely in a virtual setting. There are limitations to the study such as inability to analyze possible confounding variables such as AOA status, board scores, school ranking, and reapplications. Additionally, findings are a moving average of five years, as single-year data is not available. Despite these limitations, the study reflects general shifts in orthopaedic surgery match rates based on demographic data and could inspire future studies such as investigating pipeline contributions and granular data.

Table 1: Relative Risk of Not Matching (ref. Men)

Residency Year	Women	p-values
2015-2016	0.83 (0.76 to 0.89)	< 0.001
2016-2017	1.00 (0.93 to 1.07)	0.92
2017-2018	0.99 (0.92 to 1.06)	0.72
2018-2019	1.06 (0.99 to 1.14)	0.10
2019-2020	1.07 (0.99 to 1.15)	0.10
2020-2021	1.08 (1.004 to 1.15)	0.038
2021-2022	1.00 (0.94 to 1.07)	0.92

Table 2: Relative Risk of Not Matching (ref. White)

Residency Year	Black	Hispanic	Asian	Native
2015-2016	1.55 (1.47 to 1.63)	1.55 (1.47 to 1.64)	1.55 (1.49 to 1.62)	1.67 (1.51 to 1.85)
2016-2017	1.52 (1.44 to 1.61)	1.55 (1.46 to 1.64)	1.70 (1.63 to 1.76)	1.70 (1.53 to 1.88)
2017-2018	1.50 (1.41 to 1.60)	1.53 (1.44 to 1.62)	1.63 (1.57 to 1.70)	1.74 (1.58 to 1.91)
2018-2019	1.57 (1.48 to 1.68)	1.59 (1.49 to 1.68)	1.57 (1.50 to 1.65)	1.88 (1.72 to 2.05)
2019-2020	1.83 (1.69 to 1.97)	1.92 (1.79 to 2.06)	2.18 (2.07 to 2.29)	2.26 (2.02 to 2.53)
2020-2021	1.93 (1.78 to 2.09)	2.35 (2.21 to 2.50)	3.11 (2.98 to 3.26)	2.93 (2.70 to 3.12)
2021-2022	1.72 (1.59 to 1.86)	1.47 (1.36 to 1.60)	2.81 (2.70 to 2.91)	2.67 (2.51 to 2.84)

All years for all races, $p < 0.001$

Figure

