

Assessing the Impact of the COVID-19 Pandemic on Geographic Residency Placement Relative to Medical School Location

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ABSTRACT

Background The 2020–2021 residency application cycle was altered to reduce COVID-19 transmission, with moves to all virtual interviews and no away rotations for medical students. These changes may have affected how students ranked residency programs, such as choosing programs near their medical schools.

Objective To determine if a larger percentage of medical students matched to residency programs in the same state as their medical schools in 2021 vs 2018–2020.

Methods We searched the webpages or emailed student affairs deans of the 155 Liaison Committee on Medical Education accredited MD programs to attain medical school match lists. Differences in the percentage of students matching to residency programs in the same US state as their medical schools in 2021 vs 2018–2020 were compared using chi-square tests.

Results We recorded 36 021 of 79 406 (45%) National Resident Matching Program, 759 of 1720 (44%) ophthalmology, and 586 urology MD residency matches between 2018 and 2021. The percentage of students matching to residency programs in the same state as their medical schools was 35.9% in 2021 versus 34.3% in 2018–2020 ($P = .005$). Students were more likely to match to programs in the same state as their medical schools in 2021 if they attended a public medical school (40.3% vs 38.5%, $P = .009$) or applied into specialties where $\geq 50\%$ of students traditionally perform away rotations (32.2% vs 30.2%, $P = .031$).

Conclusions There was a small difference in the percentage of medical students matching to residency programs in the same state as their medical schools in 2021 vs 2018–2020.

Introduction

Major modifications to the 2020–2021 residency application cycle were adopted in the United States and elsewhere to mitigate the spread of COVID-19. Applicant interviews were conducted virtually and away rotations highly discouraged, which caused angst among program directors and applicants, given their importance in ranking decisions.^{1,2} Due to the lack of away rotations and in-person interviews, some have speculated that medical students may have been more likely to match to or near their home institutions in 2021 compared to prior years.³

Several surveys published since the 2021 match day have evaluated medical student perceptions of virtual interviews and the lack of away rotations.^{4–6} Notably, over 80% of students described assessing program culture and “fit” with program faculty and residents over a virtual interview format as moderately or very

challenging,⁴ and most preferred in-person interviews despite the time and cost savings associated with a virtual format.⁵ Most students also found the lack of away rotations difficult,⁴ given that away rotations expose students to their desired fields and enable them to signal interest in particular programs and develop advocates at non-home institutions.⁷ Yet, only a few subspecialty-focused studies have compared the geographic patterns of matched medical students in 2021 versus prior years.^{8,9} Here, we evaluate whether US allopathic medical students were more likely to match to residency programs in the same state as their medical schools in 2021 vs 2018–2020.

Methods

We searched the webpages of the 155 US Liaison Committee on Medical Education (LCME)–accredited MD programs and identified medical schools with publicly available match lists consistently reported from 2018–2021 as of April 19, 2021. If data were not publicly available, we emailed medical school student affairs deans to request de-identified match lists from 2018–2021. Our requests to the National Resident Matching Program (NRMP) to collaborate and access a full de-identified dataset were not granted. We then

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Editor's Note: The online version of this article contains tables detailing the specialty choice of students included and all National Resident Matching Program matched allopathic medical students from 2018–2021 and the percentage of students matching to residency programs in the same state as their medical schools in 2021 vs 2018–2020.

used the Electronic Residency Application Service (ERAS) Participating Programs and Specialties list¹⁰ to standardize specialty entry and the FREIDA institutional database¹¹ to code medical school and residency program states.

We divided specialties into surgical and non-surgical,¹² specialties where $\geq 50\%$ and $< 50\%$ of students perform away rotations,¹³ and specialties where the mean United States Medical Licensing Examination (USMLE) Step 1 scores of matched students were ≥ 240 and ≤ 230 .¹⁴ Scores of ≥ 240 and ≤ 230 were chosen to look at specialties with mean scores greater than the 60th and less than the 40th percentiles, respectively.¹⁵ Between-group differences and 95% CIs as well as χ^2 tests were used to compare the percentage of students matching to residency programs in the same US state as their medical schools in 2021 vs 2018–2020 overall and by specialty, specialty type (surgical and non-surgical), specialties where $\geq 50\%$ and $< 50\%$ of students perform away rotations, and specialties with mean Step 1 scores ≥ 240 and ≤ 230 using R version 2.14.0 (R Foundation for Statistical Computing, Vienna, Austria). $P < .05$ defined statistical significance.

The University of Pennsylvania Institutional Review Board approved this study.

Results

We recorded 36 021 of 79 406 (45%) NRMP,¹⁶ 759 of 1720 (44%) ophthalmology,^{17,18} and 586 (total number unavailable) urology medical student residency matches from 2018–2021 from 61 LCME-accredited schools. Forty-two (69%) public medical schools were included, and the most common regions in which medical schools resided were the South Atlantic (23%, 14 of 61), East North Central (18%, 11 of 61), and Middle Atlantic (16%, 10 of 61; TABLE). Private and western medical schools were underrepresented. The distribution of specialties observed in our dataset was similar to the distribution of specialties among all NRMP-matched allopathic medical students (online supplementary data).

A total of 35.9% of students matched to residency programs in the same state as their medical schools in 2021 compared to 34.3% in 2018–2020 ($P = .005$; online supplementary data). Students attending public medical schools were more likely to match to residency programs in the same state as their medical schools in 2021 vs 2018–2020 (40.3% vs 38.5%, $P = .009$) as were students matching to specialties where the mean USMLE Step 1 score was ≥ 240 (35.7% vs 30.8%, $P = .002$) and $\geq 50\%$ of students traditionally perform away rotations (32.2% vs 30.2%, $P = .031$). A higher percentage of students

TABLE

Characteristics of 61 LCME-Accredited Medical Schools Included and All LCME-Accredited Medical Schools

Location/Type of MD School	LCME MD Schools Included (n=61), n (%)	All LCME MD Schools (n=155), ^a n (%)
Distribution by region		
Northeast	16 (26)	36 (23)
New England	6 (10)	10 (6)
Middle Atlantic	10 (16)	26 (17)
South	24 (39)	57 (37)
South Atlantic	14 (23)	31 (20)
East South Central	3 (5)	9 (6)
West South Central	7 (11)	17 (11)
Midwest	19 (31)	35 (23)
East North Central	11 (18)	23 (15)
West North Central	8 (13)	12 (8)
West	2 (3)	23 (15)
Mountain	0 (0)	7 (5)
Pacific	2 (3)	16 (10)
Medical school type		
Private	19 (31)	64 (41)
Public	42 (69)	91 (59)

Abbreviations: LCME, United States Liaison Committee on Medical Education.

^a Four LCME MD schools are in Puerto Rico and not included in the counts for distribution by region.

matched to residency programs in the same state as their medical schools in 2021 for dermatology (44.6% vs 34.3%, $P = .018$), combined internal medicine–pediatrics (40.1% vs 28.2%, $P = .008$), and orthopedic surgery (37.8% vs 31.5%, $P = .037$). We observed no other significant differences by specialty.

Discussion

We found a very small increase in the percentage of students matching to residency programs in the same state as their medical schools in 2021 compared to 2018–2020. Larger differences were observed for some specialties, such as dermatology and combined internal medicine–pediatrics, but these findings require further examination due to study limitations.

Virtual interviews, COVID-19, and the absence of away rotations may have all contributed to the differences we observed. Interestingly, students matching into specialties where $\geq 50\%$ of students perform an away rotation were more likely to match to residency programs in the same state as their medical schools. In prior years, a considerable percentage of students matched to programs where they did away rotations,¹⁹ and the absence of away rotations may have limited students' abilities to signal

interest or develop advocates at non-home institutions. Students who attended public medical schools were also more likely to stay in the same state for residency in 2021. Since students who attend public schools are more likely to be in-state residents,²⁰ they may have favored staying in the same state as their medical schools, given that proximity to family has been increasingly prioritized during the pandemic for Americans in general.²¹

Subspecialty-focused studies have also explored residency placement relative to medical school location in 2021. One study among matched urology applicants⁸ found no difference in the median distance between medical school and residency program in 2021 vs 2016–2020, while another among matched plastic surgery applicants⁹ found students were more likely to match to their home programs in 2021 vs 2015–2020, but no more likely to match to programs in the same state as their medical schools in 2021, which is consistent with our results for plastic surgery. Both studies utilized data from publicly available webpages and social media sites as opposed to school-reported match lists.

This study is limited by the lack of a full dataset, with a little less than half of medical schools included and western and private schools underreported. Thus, the data may not generalize to all US medical schools. We also excluded osteopathic students, who comprised approximately 22% of matched students from 2018–2021, which limits the application of the results to these students. Some of our subgroup comparisons that showed small significant differences may be spurious, since we did not adjust the alpha level despite the large number of comparisons we made. We also used US states as a proxy for geographic placement, which ignored nearby border crossings and did not control for the student's home state.

Future research regarding residency geographic preferences might focus on students underrepresented in medicine who may be disparately affected by the change to virtual interviews and reduced opportunities for away electives. In addition, the relationship of residency geographic preference to home state or region, considering shortages in many states, should be considered. Qualitative methods may be needed to understand how medical student ranking decisions have been affected in the virtual recruitment era.

Conclusions

We observed a very small increase in the percentage of students matching to residency programs in the same state as their medical schools in 2021 vs 2018–2020.

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