

COVID-19 and the Integrated Plastic Surgery Match: An Update on Match Trends by Applicant Location

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Background: COVID-19 significantly impacted the residency match process. Away rotations and in-person interviews were canceled in 2021, resulting in a geographic shift in integrated plastic surgery match results. Although several of these limitations were lifted during the 2022 cycle, the resulting geographic outcomes have yet to be described. This study aims to determine whether the changes seen during the previous cycle persisted despite loosened restrictions.

Methods: Integrated plastic surgery match results and applicants' home institutions from the 2022 match cycle were determined using publicly available data. Geographic data from this cycle were then compared with pre-COVID-19 match cycles (2016–2020) and the COVID-19-affected 2021 match cycle.

Results: Eighty percent ($n = 68$) of US integrated plastic surgery programs were included in this study. In 2022, 18.42% of applicants matched at their home institution compared with 25.12% in 2021. There was no significant difference in home, state, or regional match rates between 2022 and the five cycles preceding the pandemic (2016–2020). Combining these data to reflect the non-COVID-19-affected cycles (2016–2020 and 2022) and comparing to the COVID-19-affected cycle (2021), a significant difference in rates of home matches ($P = 0.0395$) was identified.

Conclusions: A significant increase in home institution match rates was not noted during the 2022 cycle. This return to pre-COVID-19 rates is likely attributed to the loosening of restrictions and more opportunities for interaction between applicants and programs outside of their home institution. (*Plast Reconstr Surg Glob Open* 2022;10:e4527; doi: 10.1097/GOX.0000000000004527; Published online 26 September 2022.)

INTRODUCTION

The COVID-19 pandemic has had wide-ranging impacts on virtually every aspect of society, and the national residency matching program has been no exception. Over the past 2 years, the Association of American Medical Colleges (AAMC) has adjusted limitations of fourth-year medical students applying to residency as the climate of the pandemic evolved. Away rotations, which had previously been a staple for fourth-year medical students, were suspended in May 2020, and institutions were strongly encouraged to conduct all residency interviews virtually.^{1–4} Although some restrictions (virtual interviews and limited away rotations)

offer the benefit of saving applicants a significant amount of money, the restrictions are not without consequences⁵ and must be carefully weighed, especially when applicants are applying into competitive specialties such as plastic surgery.⁷ Such restrictions drastically limited applicants' exposure to residency programs outside of their home institution. Numerous studies evaluating 2021 match data showed a significant increase in applicants matching at their home institutions compared with previous years.^{8–15} The link between these changes and the COVID-19 pandemic has been described in detail. Among students interested in plastic surgery, COVID-19 not only affected the residency application process but also negatively impacted these students' confidence in their medical education.¹⁶ However, what has yet to be explained is whether these changes represent a permanent shift in match patterns or whether pre-COVID-19 patterns will reemerge with time.

With the continued research, development, and distribution of COVID-19 vaccines, society at large has seen a shift toward some pre-COVID-19 activities. Correspondingly, the AAMC partially lifted limitations during the 2022 match cycle, allowing applicants

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to attend one away rotation; interviews, however, were still conducted virtually.¹⁷ The importance of away rotations on the residency match process has been well described.^{18,19} Away rotations not only provide applicants an opportunity to spend meaningful time with a program and make a lasting impression on those involved in interview decision-making, but they can also increase an applicant’s overall competitiveness at a given program.²⁰ As a consequence, the changes seen during the 2021 match cycle come as little surprise. What remains to be described is whether or not these changes persisted during the 2022 match cycle despite partially lifted restrictions.

Although the follow-on effects of the pandemic have been largely unpredictable, it seems reasonable to expect a return to prepandemic patterns of geographic match results as restrictions on away rotations lessen and programs potentially return to in-person interviews. This study aims to investigate the geographic distribution of the 2022 integrated plastic surgery match results and compare these findings to both prepandemic and midpandemic match results.

METHODS

Integrated plastic surgery residency programs were identified using the Fellowship and Residency Electronic Interactive Database Access. The 2022 applicants who matched at each program and their medical schools were identified using a combination of official program websites and social media accounts (Facebook, Instagram, and Twitter). Additional match data from the 2016–2021 match cycles were collected for all remaining programs using current resident [postgraduation year (PGY) 1 through PGY6] profiles available on programs’ official websites. Programs without available information were queried via emails sent to the program coordinators. Programs were excluded if home institution data could not be obtained for each resident that matched between the 2016 and 2022 match cycles. All independent plastic surgery residents/fellows were also excluded.

Using the compiled 2016–2022 match results, each applicant and current resident were assigned to one of four categories: “home match,” “in-state,” “in-region,” or “neither.” Applicants and current residents were assigned “home match” if they matched at the integrated plastic surgery residency program affiliated with their medical school. Similarly, those who matched at residency programs in the same state as their medical school were assigned “in-state.” Applicants and residents were assigned “in-region” if they matched at a program in the same

Takeaways

Question: What was the geographic distribution of the 2022 integrated plastic surgery match results and how did this distribution compare to prepandemic (2016–2020) and midpandemic (2021) match results?

Findings: Aggregated home institution match rates from non-COVID-affected years (2016–2020 and 2022) differed significantly from home institution match rates during the 2021 cycle.

Meaning: The marked increase in home institution match rates seen during the 2021 integrated plastic surgery match cycle appears to represent a transient departure from baseline rather than foundational shift in geographic match data.

region as their medical school, as defined by the United States Census Bureau’s four statistical regions. All remaining applicants and residents were assigned “neither.”

RESULTS

From the 68 programs with available data, in 2022, 18.42% matched to home institutions, 23.68% matched in-state, and 48.68% matched in-region. In 2021, 25.12% matched to home institutions, 30.76% matched in-state, and 55.10% matched in-region (Table 1).

Comparing match year 2022 (PGY0) to aggregated non-COVID-19-affected match years (2016–2020) revealed no significant differences in home, state, or regional match rates (Figs. 1–3). There were also no significant differences in comparing match year 2022 (PGY0) to aggregated non-COVID-19-affected match years (2016–2020) outside home institution, state, or region. Comparing non-COVID-19 match years (2016–2020 and 2022) to the COVID-affected match year (2021) revealed a significant difference in rates of home match and outside home match rates ($P = 0.0395$; Fig. 4), without any significant difference in or out of state and in or out of regional match rates (Table 2).

DISCUSSION

Guidelines from the AAMC evolved from eliminating away rotations and in-person interviews altogether at the height of the pandemic during the 2021 match cycle, to lifting some restrictions on away rotation during the 2022 match cycle. The importance of geography in the residency match process predates the COVID-19 pandemic.⁶ Residency programs have demonstrated a preference

Table 1. Percentage of Students Matching to Their Home Institution, State, and Region, 2016–2022

Match Year	No. Programs	No. Students	Average % Home Match	Average % in State Match	Average % in Region Match
2016 (PGY6)	68	144	17.18	20.96	43.75
2017 (PGY5)	68	149	18.08	27.18	44.30
2018 (PGY4)	68	154	17.89	26.35	52.59
2019 (PGY3)	68	151	14.61	29.59	52.32
2020 (PGY2)	68	143	19.79	28.26	48.25
2021 (PGY1)	68	147	25.12	30.76	55.10
2022 (PGY0)	68	152	18.42	23.68	48.68

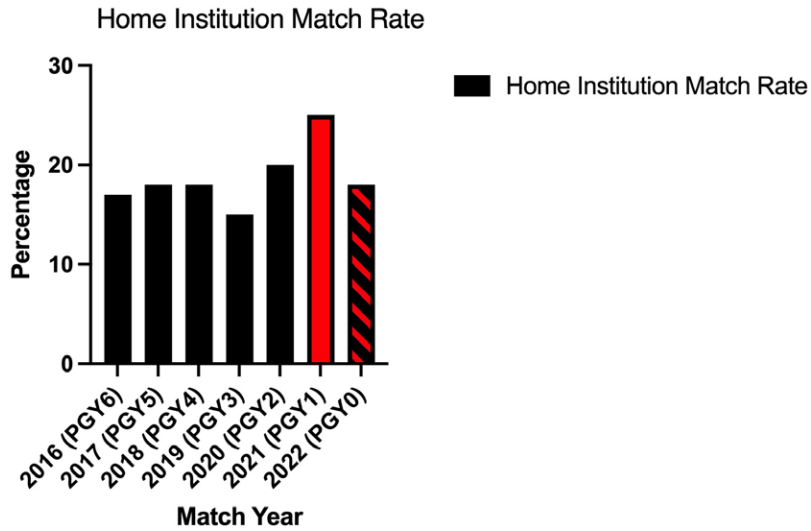


Fig. 1. Home institution match rates from years 2016–2022 (COVID-affected years in red and partially affected year with additional black diagonal lines).

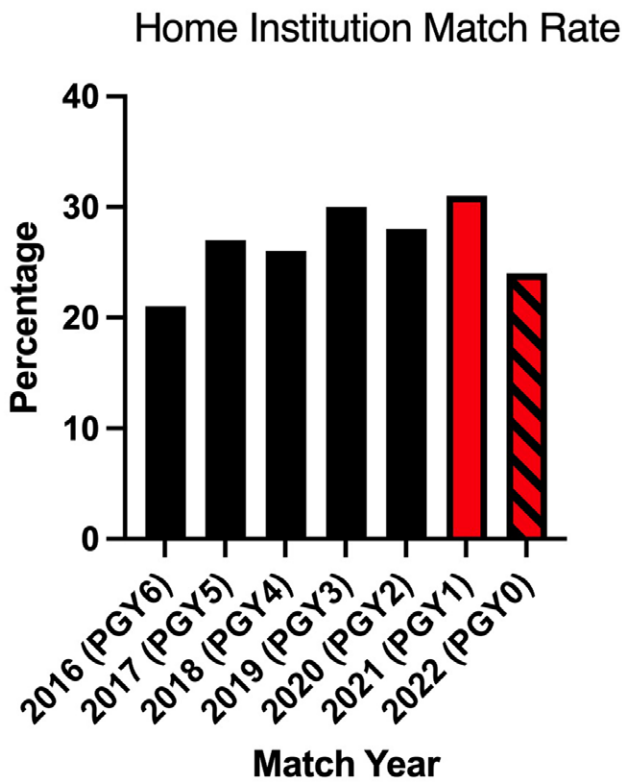


Fig. 2. In-state institution match rate from years 2016–2022 (COVID-affected years noted in red and partially-affected year with additional black diagonal lines).

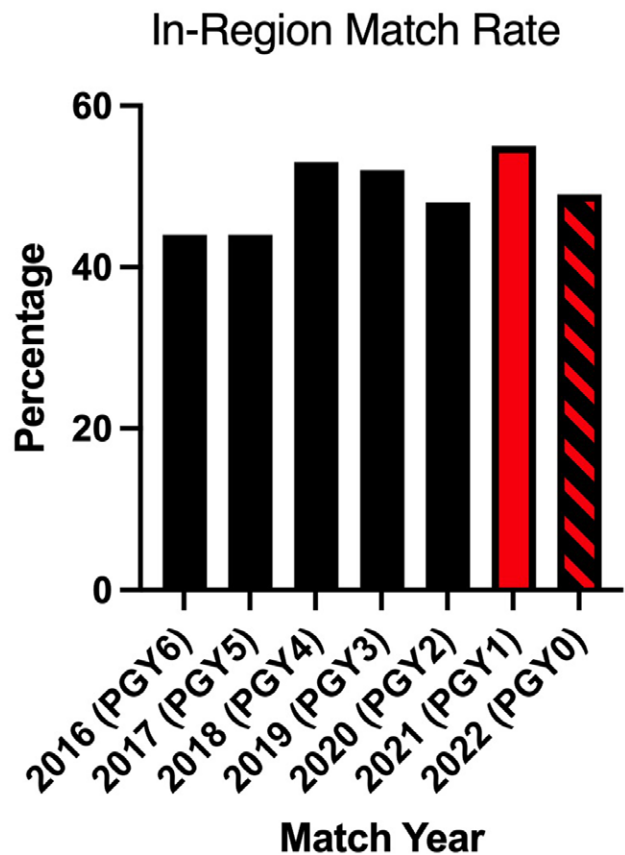


Fig. 3. Regional institution match rate from years 2016–2022 (COVID-affected years noted in red and partially affected year with additional black diagonal lines).

toward the “known” of an applicant at their home institution as opposed to the “less-known” or “unknown” of an applicant who did or did not do an away rotation, respectively. This preference has been observed not only in plastic surgery but also in other surgical subspecialties as well.^{21–24}

Despite such history, this selection bias toward home medical students may not be in a program’s best interest as they could benefit from trainees with diverse backgrounds. Some institutions have proposed methods to address this

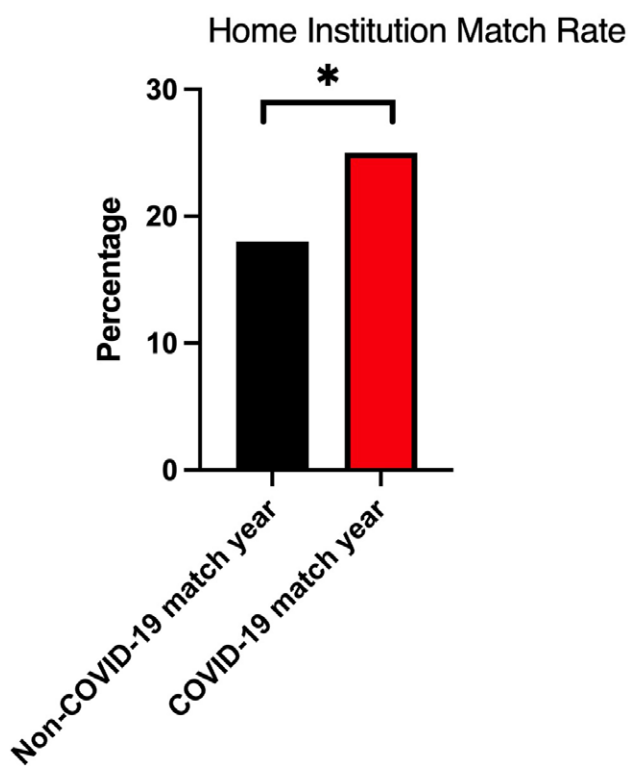


Fig. 4. Aggregated home institution match rates from COVID-19-affected (2021) and non-COVID-19-affected (2016–2020 and 2022) years (COVID-affected year noted in red).

issue.²⁵ The COVID-19 pandemic forced residency programs to develop virtual means by which to interview and engage with applicants. The virtual tools developed may serve as useful adjuncts to traditional methods of away rotations and in-person interviews in the future. They may help eliminate existing selection bias and help level the playing field from a financial perspective since away rotations and in-person interviews are incredibly expensive for applicants; however, early results are inconclusive.²⁶

A central question has yet to be answered, and the goal of this study was to investigate whether the effects of COVID-19 during the 2021 match cycle reflect a transient departure from baseline or foundational shift in geographic match data. We found that applicants participating in the 2022 match cycle were no more likely to have matched at their home institution than they were in previous, non-COVID-19-affected years. When adding the most recent match data and comparing the aggregated non-COVID-19-affected years to the COVID-affected 2021 match year, there remains a significant difference in rates of matching at home institutions (Table 2). These results

suggest that the rates of students matching at their home institution observed during the 2021 match cycle were more likely an anomaly than evidence of a more permanent change altogether. There was an interesting decrease in the percentage of applicants matching to their home institution in the 2019 match, although it did not reach a level of significance. Plausible explanations for this discrepancy may be due to an increase in the number of applications or students performing away rotations during that match cycle. Although the 2022 match cycle was certainly affected by COVID-19 (limitations on the number of away rotations and virtual interviews), the return of away rotations coinciding with a return to normal match patterns could suggest that away rotations play a more significant role in matching students to outside institutions than in-person interviews.¹⁰

Armed with this information, applicants should feel encouraged to engage with away rotations similarly to how they would in pre-COVID-19 years. Given that a large majority of students (~80%) will match at a non-home institution, returning to away rotations remains a significant advantage to students in an era where matching into an integrated plastic surgery residency program is as competitive as ever. This effect is further compounded by the fact that in-person interviews, an integral component of the plastic surgery match process, have yet to resume. As restrictions continue to lessen in the coming years, we expect to see a continued return to baseline match rates for home institutions and geographic distribution.

This study has several limitations, some or all of which would benefit from further investigation. First, this study was conducted using only publicly available resident lists and social media posting and could be impacted by sampling bias. It is possible that programs without publicly available resident data are more likely to be smaller, less well-known programs. These programs may be more likely to be ranked lower on an applicant’s rank list and, therefore, interact with the match algorithm in a much different manner than their larger counterparts. Their absence in our analysis may affect the applicability of these results to plastic surgery residency programs as a whole. This study also did not evaluate applicants who did not match, especially for those without a home plastic surgery program. Additionally, our study did not interrogate all factors that could also impact the geographic distribution of match outcomes such as personal connections, locations where applicants grew up, programs where applicants did their away rotations, and academic performance. Finally, because this study focused on integrated plastic surgery residency programs, results may not be extrapolated

Table 2. Comparison of COVID-19-affected Match Year (2021) to Non-COVID-19-affected Match Years (2016–2020 and 2022), Percentage of Students Matching to Their Home Institution, State, and Region, 2016–2022

Match Year	No. Programs	No. Students	Average % Home Match	Average % In-state Match	Average % In-region Match
Non-COVID-19-affected match year	68	893	17.69 [*]	25.73	48.16
COVID-19-affected match year	68	147	25.12 [*]	30.76	55.10

^{*}P value significant at <0.05 (P = 0.039).

to other specialties or other residency pathways within plastics.

Despite these limitations, this study underscores the importance of reflection and adaptation when considering the evolution of surgical trainee selection. The changes made as a result of the COVID-19 pandemic remind us that the residency match process need not be a stagnant doctrine, but can instead flex to the needs of its participants. The results described herein highlight several opportunities to steer the match process in a direction that promotes diversity and equity among applicants. Although away rotations and in-person interviews may provide the ideal opportunity for applicants and programs to familiarize themselves with one another, these methods can be cost-prohibitive for some students and, according to these most recent match results, not entirely necessary. It is possible that the patterns observed during the heart of the COVID-19 pandemic were a result of the playing field being leveled for applicants with less financial resources available to devote to traveling around the country to spend time with potential residency programs. Analysis of data from the National Resident Matching Program would be a logical next step to take to better understand the impact of the lessening of COVID-19 restrictions on other match statistics such as the number of interviews applicants accepted or the number of programs they ranked. Data from the 2023 match cycle, during which there will be no restrictions on away rotations but interviews will be limited to a virtual format, will also provide a more accurate picture of the lasting effect—or lack thereof—of COVID-19 on match patterns. Ultimately, having access to objective data will be helpful for applicants and program directors interested in being intentional and aware when navigating the post-COVID-19 years in the residency match process. If nothing else, the tumult of COVID-19 has afforded us all a lesson in adaptability and served as a catalyst for conversations which, if used discerningly, can lead to meaningful change in the equity of the integrated plastic surgery match process.

CONCLUSIONS

Owing to decreased institutional restrictions on away rotations, home match rates during the 2022 match cycle differed significantly from the preceding year. In contrast to the 2021 match cycle (PGY1) which noted a significant increase in match rates at home institutions, the effect of COVID-19 on the home match rate for incoming 2022 integrated plastic surgery interns (PGY0) was noted by a return to previous prepandemic levels of match rates at home institutions.

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