

Ophthalmology Residency Match Outcomes for 2011

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Purpose: To determine the match rate and predictors of matching into an ophthalmology residency.

Design: Population-based, cross-sectional study.

Participants: All 746 candidates who submitted an application for the 2011 ophthalmology residency match.

Methods: The Ophthalmology Residency Matching Program applicant database was reviewed to determine applicant characteristics and match outcomes. For US seniors, multivariate regression analysis was performed to determine predictors of matching.

Main Outcome Measures: Match rate and predictors of US seniors matching.

Results: Rank lists were submitted by 622 applicants, among whom 458 (74%) matched. The match rate was higher for US seniors (83%) than for independent applicants (41%; $P < 0.001$). US seniors who matched were more likely to be Alpha Omega Alpha medical honor society members (odds ratio [OR], 2.94; 95% confidence interval [CI], 1.16–7.29), to attend medical schools ranked in the top 40 according to National Institutes of Health funding (OR, 2.25; CI, 1.14–4.43), and to have ranked more programs (OR, 1.44; CI, 1.29–1.60). Those ranking 6 to 10 programs had an 80% to 90% chance of matching, and those ranking more than 10 programs had a greater than 90% chance of matching. No clear benefit was observed by ranking additional programs once 11 had already been ranked. Average US Medical Licensing Examination Step 1 scores were 239 ± 14 and 223 ± 18 for applicants who were matched and unmatched, respectively; this difference was significant by univariate analysis ($P < 0.001$) but not by multivariate regression ($P = 0.163$).

Conclusions: Ophthalmology ranks among the most competitive specialties in medicine. Those most likely to match were US seniors who maintained academic excellence beginning in their preclinical years. A finite relationship exists between ranking a greater number of programs and having a greater chance of matching.

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All ophthalmology residency candidates must apply for a position through the Ophthalmology Residency Matching Program (OMP). The OMP was established in 1977 under the auspices of the Association of University Professors of Ophthalmology to coordinate residency appointments. Administered by the San Francisco Matching Programs, the OMP uses a universal application that all candidates must complete. Once completed, applications are disseminated to residency programs as designated by the applicants. Residency programs then select which applicants to send interview offers, which applicants may accept or decline. On completion of the interview process, applicants and programs both submit rank lists to the match. The match is an algorithm that uses the preferences expressed in the rank-order lists to place applicants into residency positions (available at: www.sfmach.org for more details; accessed May 23, 2011).

Ophthalmology residency training positions are in high demand. Each year, applicants greatly outnumber positions available.¹ Although the National Residency Matching Program (NRMP) and Association of American Medical Colleges periodically publish detailed match outcomes for other fields in medicine,² data and analyses of similar levels of

detail have not been published concerning the ophthalmology match. We report the match rate for ophthalmology residency positions and compare it with the match rates of other specialties. Applicant characteristics were analyzed to identify potential predictors of matching. This report will be of value to applicants considering a career in ophthalmology and preparing for the match, as well as faculty who are called on for advice regarding the match.

Materials and Methods

We reviewed the 2011 OMP database to determine the number of applicants and positions offered, the number of programs each applicant applied to, and the number of programs ranked by each applicant, match status, and, for those matching, rank number of the program for which they matched (i.e., matched at first choice, second choice, third choice). Data in this detail were not recorded electronically and available for analysis before the 2011 match.

The main outcome measures were match rate, calculated by dividing the number of applicants submitting a rank list by the number of positions offered, and predictors of US seniors matching. On the basis of the classification system used in the NRMP and Association of American Medical Colleges match report,² applicants were categorized as US seniors (i.e., senior students at

allopathic US medical schools) or independents (i.e., graduates of US allopathic medical school, seniors and graduates of US osteopathic medical school, and seniors and graduates of international medical schools). United States Medical Licensing Examination (USMLE) Steps 1 and 2 three-digit scores were recorded whenever available for all applicants. For US seniors, membership status in the Alpha Omega Alpha (AOA) medical honor society and matriculation at a medical school ranked in the top 40 according to National Institutes of Health (NIH) funding³ were also recorded.

Univariate analyses (chi-square and independent *t* tests) were performed to compare applicant characteristics by match status. For US seniors, variables with *P* < 0.20 underwent multivariate logistic regression; only those with *P* < 0.05 were considered significant. Because USMLE Step 1 and Step 2 scores were highly correlated (*r* = 0.73) and many applicants did not report a Step 2 score (46%), only Step 1 was included in multivariate analysis. Other variables studied in the multiple regression were not highly correlated (*r* < 0.55). Three applicants (0.6%) were excluded from multivariable analysis because they did not report a Step 1 score. The heterogeneous independent group had too few factors to compare for multivariate regression. Statistical analysis was performed with SPSS statistical analysis package version 19.0 (SPSS Inc., Chicago, IL). This study was approved by the institutional review board.

Results

Applicant types are summarized in Figure 1. Most applicants were US seniors (68%). International medical students and graduates (22%) were the second most common group of applicants.

Match statistics are summarized in Table 1 (available at <http://aoajournal.org>). The number of applicants (746) outnumbered the number of positions offered (461); the number of applicants per position was 1.6 (i.e., for every 100 positions, there were 160 applicants). Match rates were significantly higher for US seniors when compared with independent applicants (*P* < 0.001). For those matching in both groups, approximately 40% and 75% matched into their top or top 3 choices of programs, respectively.

On univariate analysis (Table 2, available at <http://aoajournal.org>), USMLE Step 1 and Step 2 scores and number of programs

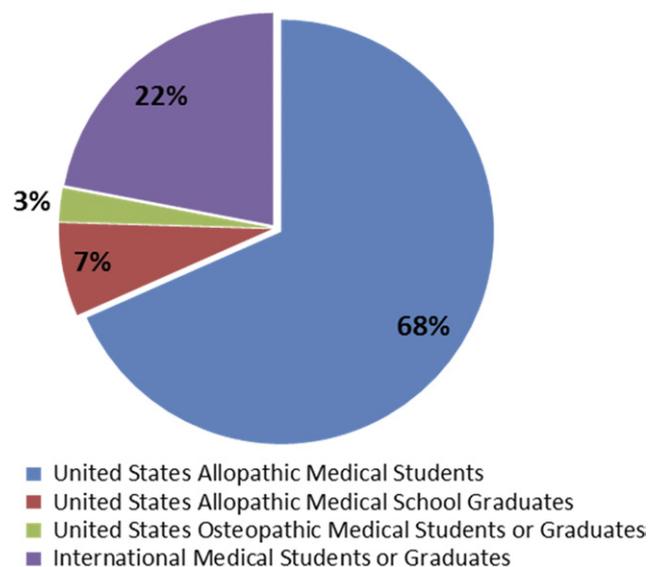


Figure 1. Applicant types.

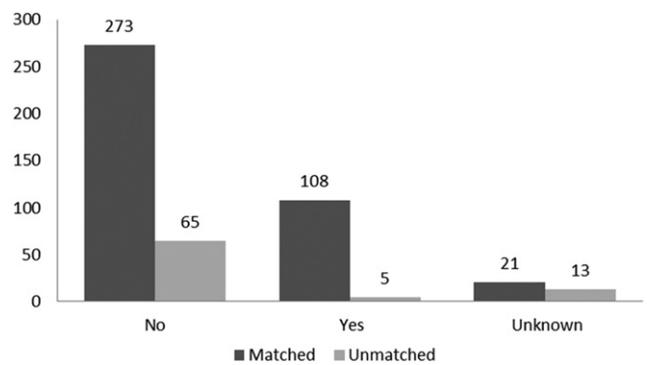


Figure 2. Match status by Alpha Omega Alpha Honor Medical Society membership.

ranked were associated with matching for US seniors and independent applicants. In addition, AOA membership and matriculation at a medical school ranked in the top 40 according to NIH funding were also associated with matching for US seniors; proportions of those matching with respect to these factors are illustrated in Figures 2 and 3. Table 3 (available at <http://aoajournal.org>) summarizes the results of multivariate regression analysis for US seniors; all variables had *P* < 0.05, except USMLE Step 1 score (*P* = 0.163).

A probability plot was created to estimate chances of matching based on USMLE Step 1 score (Fig 4); a 66% and an 84% chance of matching were achieved by scoring at least a 220 and 240, respectively. Another probability plot was created to estimate chances of matching based on the number of programs ranked by applicants (Fig 5); those ranking 6 to 10 programs and more than 10 programs had an 80% to 90% and a greater than 90% chance of matching, respectively. No clear benefit was observed by ranking additional programs once 11 had already been ranked.

Discussion

This study presents data and analyses not previously available to better inform applicants and advisors about the ophthalmology match. The ophthalmology residency match rate for those submitting a rank list is among the lowest in medicine (Fig 6). As is the case for other specialties, the match rate is significantly higher for US seniors compared with independent applicants (*P* < 0.001). Not all registrants

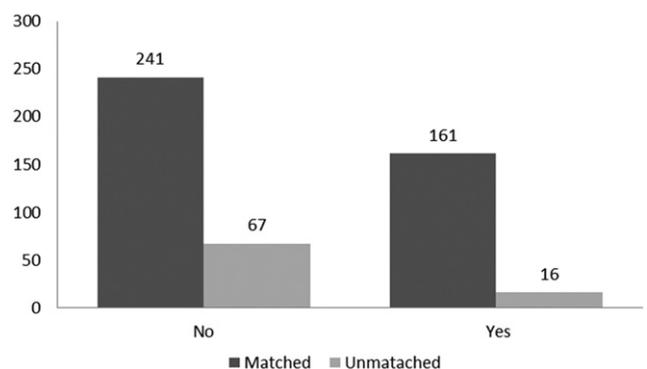


Figure 3. Match status by matriculation at a medical school ranked in the top 40 according to National Institute of Health funding.*

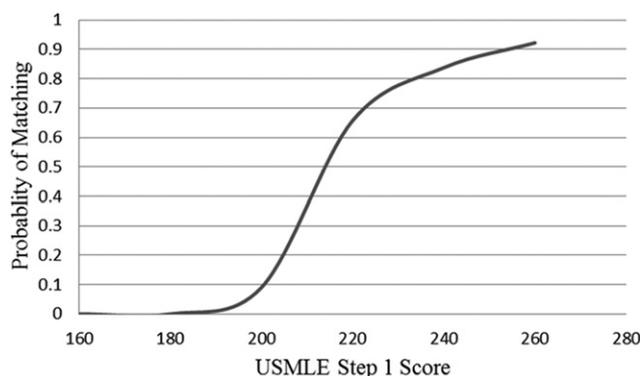


Figure 4. Probability of matching by United States Medical Licensing Examination (USMLE) step 1 score.

who submit an application submit a rank list (Table 1, available at <http://aaojournal.org>). We hypothesize that this occurs when applicants (1) do not receive an interview invitation and have no program to rank, (2) do not interview somewhere they like enough to rank, or (3) decide to pursue a different career path. Subsequently, the match rate for all those submitting an application is lower (61% overall; 79% and 24% for US seniors and independents, respectively) than for those submitting a rank list (74% overall; 83% and 41% for US seniors and independents, respectively). Therefore, the true match rate for those desiring a position and obtaining one is likely 61% to 74% overall and 79% to 83% and 24% to 41% for US seniors and independents, respectively. The 2011 overall match rate of 74% is similar to that of past years, which averaged $70 \pm 3\%$ from years 2000 to 2010.¹

US seniors who matched had higher USMLE Step 1 ($P = 0.006$) and Step 2 ($P = 0.001$) scores than independents who matched. A similar trend has been demonstrated in the matches for other specialties.² Univariate analyses demonstrated that USMLE Step 1 and 2 scores were higher for US seniors and independents applicants who matched than those who did not (Table 2, available at <http://aaojournal.org>; $P < 0.001$). The USMLE Step 2 scores are not required by most US medical schools at the time applications are submitted. Therefore, approximately 50% of US seniors did not report a Step 2 score in their application. However, it is possible that some applicants provided score reports directly to programs if they became available after they submitted their application but before the rank list submission was due. Because USMLE Step 1 and Step 2 scores were highly correlated and few applicants reported Step 2 scores, only Step 1 was included in multivariable analysis ($P = 0.163$). In a large national survey of program directors for other specialties by the NRMP, USMLE Step 1 was found to be the most frequently cited factor in selecting applicants for an interview but less important in the final ranking of applicants⁴; a similar relationship could exist in the ophthalmology match process.

Multivariable analysis for US seniors confirmed that AOA membership, matriculation at a medical school ranked in the top 40 according to NIH funding, and ranking more programs were predictors of matching. This likely reflects

the applicants' ability to demonstrate academic excellence from the beginning of their premedical and medical careers, as well as attendance at nationally recognized medical universities that may offer more research and networking opportunities. The median number of programs ranked by those matching (11) was approximately 4 times higher than those not matching (3). Figure 5 demonstrates a trend that those who ranked more programs had a higher probability of matching. There were exceptions to this rule. The most paradoxical finding occurred in applicants who ranked 7 and 9 programs and had match rates of 89% and 86%, respectively. Differences of this magnitude are small and do not obviate the overall trend. Although applicants who ranked 20 programs all matched in the 2011 match, the number of programs ranked does not guarantee matching. Likewise, no examination score or society membership can guarantee a match. The clearest benefit of ranking more programs was seen up to the sixth program ranked. A smaller benefit may be present in ranking additional programs up to the 11th program, but continuing to rank additional programs thereafter did not result in any significant benefit.

Potential and current applicants may explore this report in an effort to predict their chances of obtaining an ophthalmology residency position, with the understanding that factors other than those described in this article play an influential role in ranking applicants. A recent survey by Nallasamy et al⁵ of ophthalmology faculty involved in resident selection found that respondents identified interview performance and letters of recommendation as among the most important factors in ranking applicants; the present study cannot control for these variables, which may explain why some applicants who demonstrated a superior level of scholastic achievement and ranked a large number of programs still did not match. Our study was designed to analyze objective and quantifiable variables and present analyses to applicants, allowing them to assess how they compare with other applicants and how competitive they might be on the basis of only the factors described; it is the first to do so for the ophthalmology match, to the best of our knowledge. The present study is limited by the number of factors available for analysis and by the availability of data only for the 2011 match. Therefore, readers should interpret our findings with the understanding that additional factors

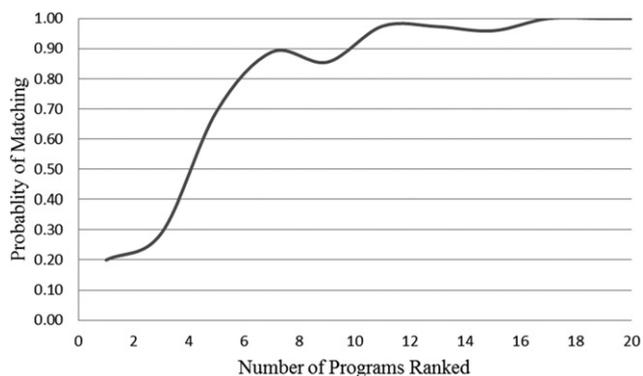


Figure 5. Probability of matching by number of programs ranked by applicant.

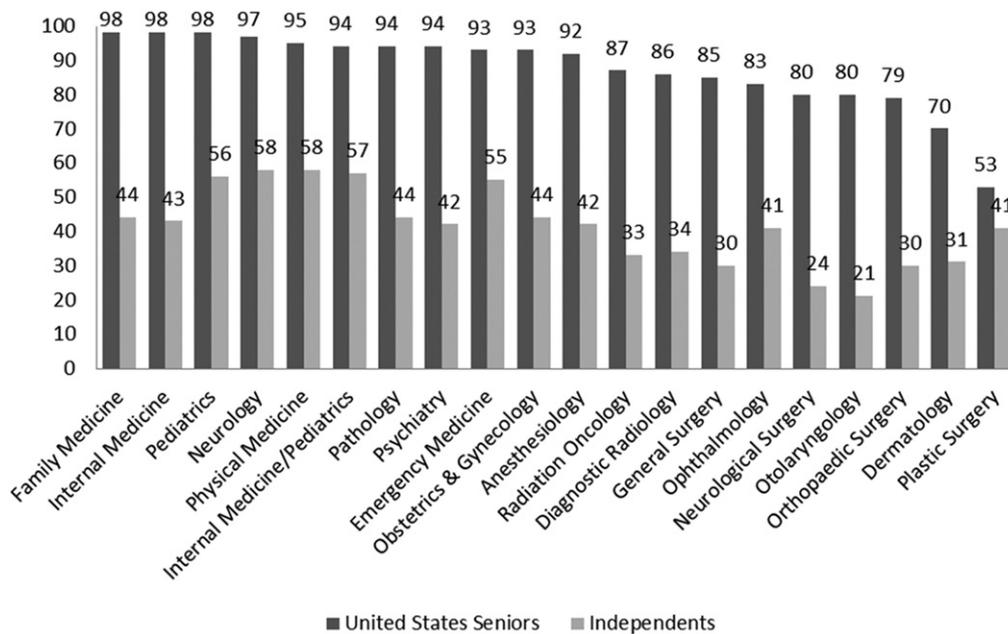


Figure 6. Comparison of match rates by specialty.

are involved in the ranking of applicants and that some changes are likely between application cycles. In addition, our study design did not control for information applicants might present directly to programs (e.g., updates on Step 2 scores and AOA membership), which could have an effect on univariate and multivariate analyses.

In conclusion, we recommend the following to future applicants:

1. Applicants should rank all programs from which they would like to receive training in order to maximize their chances of matching, with the understanding that a finite relationship exists between ranking a greater number of programs and having a greater chance of matching; no clear benefit was observed in ranking additional programs once 11 had already been ranked. Programs should be ranked not on the basis of the applicant's perception of the likelihood of matching but on his or her desire to train at that program, because the match algorithm is driven by the applicant's, not the program's, requests for placement.
2. The probability of matching with a low USMLE score is low (e.g., those scoring ≤ 200 had a $< 10\%$ chance of matching). Future applicants who have had difficulty with standardized examinations should formulate a study strategy with the help of an advisor and begin test preparation early.
3. Generally, only those in the top quartile of their class are eligible to become AOA members.⁶ Therefore, it is important to establish academic excellence in the preclinical years of medical school and maintain this standard. However, AOA membership is not a requirement for matching; most US seniors who matched were not members.

4. For those who do not attend a medical school ranked in the top 40 according to NIH funding, some of the benefits may still be obtainable. Clerkship electives at highly regarded academic ophthalmic institutions may provide opportunities for involvement in research projects, networking, and solicitation of letters of recommendations from well-known faculty. Achieving these benefits will require appropriate planning before the clerkship begins and may not be possible from a single short clerkship. In addition, suboptimal performance at any time during the clerkship may result in an overall negative impression of the applicant. Programs should be researched to determine which are most receptive to clerkships by visiting students or graduates.

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Footnotes and Financial Disclosures

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