



Trends in ophthalmology applicants going unmatched in the Canadian Resident Matching Service

Tendances parmi les candidats en ophtalmologie non jumelés dans le cadre du Service canadien de jumelage des résidents

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Article abstract

Background: Applicants to ophthalmology have high rates of going unmatched during the CaRMS process, but how this compares to other competitive or surgical specialties remains unclear. Our research aims to examine this phenomenon by identifying trends and comparing match data with other specialties, to identify disparities that may inform the need for future interventions to improve the match process for applicants.

Methods: We used a cross-sectional analysis of data provided by CaRMS on the residency match from 2013 to 2022.

Results: We obtained data from 608 ophthalmology, 5,153 surgery, and 3,092 top five (most competitive) specialty first choice applicants from 2013-2022. Ophthalmology applicants were more likely to go unmatched (18.9% [120/608]) than applicants to the top five (11.9% [371/3,092]) and surgical (13.5% [702/5,153]) specialties ($p < 0.001$) and were twice as likely to rank no alternate disciplines (31.8%, $p < 0.001$) over the study period. In the first iteration, when alternate disciplines were ranked, the match rate to alternate disciplines was highest for ophthalmology applicants (0.41, $p < 0.001$). The majority (57.8%) of unmatched ophthalmology applicants do not participate in the second iteration.

Conclusion: Compared to other competitive specialties, first choice ophthalmology applicants were more likely to go unmatched, rank no alternate disciplines, and choose not to participate in the second iteration. Ophthalmology applicant behaviours should be further studied to help explain these study findings.



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Abstract

Background: Applicants to ophthalmology have high rates of going unmatched during the CaRMS process, but how this compares to other competitive or surgical specialties remains unclear. Our research aims to examine this phenomenon by identifying trends and comparing match data with other specialties, to identify disparities that may inform the need for future interventions to improve the match process for applicants.

Methods: We used a cross-sectional analysis of data provided by CaRMS on the residency match from 2013 to 2022.

Results: We obtained data from 608 ophthalmology, 5,153 surgery, and 3,092 top five (most competitive) specialty first choice applicants from 2013-2022. Ophthalmology applicants were more likely to go unmatched (18.9% [120/608]) than applicants to the top five (11.9% [371/3,092]) and surgical (13.5% [702/5,153]) specialties ($p < 0.001$) and were twice as likely to rank no alternate disciplines (31.8%, $p < 0.001$) over the study period. In the first iteration, when alternate disciplines were ranked, the match rate to alternate disciplines was highest for ophthalmology applicants (0.41, $p < 0.001$). The majority (57.8%) of unmatched ophthalmology applicants do not participate in the second iteration.

Conclusion: Compared to other competitive specialties, first choice ophthalmology applicants were more likely to go unmatched, rank no alternate disciplines, and choose not to participate in the second iteration. Ophthalmology applicant behaviours should be further studied to help explain these study findings.

Résumé

Contexte : Les candidats à l'ophtalmologie ont un taux élevé de non-jumelage au cours du processus CaRMS, mais une comparaison avec d'autres spécialités compétitives ou chirurgicales reste à faire. Notre travail a pour but d'examiner ce phénomène en identifiant des tendances et en comparant les données de jumelage avec celles d'autres spécialités, à la recherche de disparités susceptibles d'éclairer le besoin d'interventions futures pour améliorer le processus de jumelage pour les candidats.

Méthodes : Nous avons procédé à une analyse transversale des données fournies par CaRMS sur le jumelage des résidents de 2013 à 2022.

Résultats : Nous avons obtenu des données sur 608 candidats en ophtalmologie, 5 153 en chirurgie et 3 092 candidats dont le premier choix était l'une des cinq spécialités les plus compétitives de 2013 à 2022. Les candidats en ophtalmologie étaient plus susceptibles de ne pas être jumelés (18,9 % [120/608]) que les candidats aux cinq spécialités les plus compétitives (11,9 % [371/3 092]) et aux spécialités chirurgicales (13,5 % [702/5 153]) ($p < 0,001$), et étaient deux fois plus susceptibles de ne classer aucune autre discipline (31,8 %, $p < 0,001$) au cours de la période d'étude. Lors du premier tour, lorsque des disciplines alternatives ont été classées, le taux de jumelage avec les disciplines alternatives était le plus élevé pour les candidats en ophtalmologie (0,41, $p < 0,001$). La majorité (57,8 %) des candidats non jumelés en ophtalmologie ne participent pas au deuxième tour.

Conclusion : Comparativement à d'autres spécialités compétitives, les candidats dont le premier choix étaient l'ophtalmologie étaient plus susceptibles de ne pas être jumelés, de ne pas classer d'autres disciplines et de choisir de ne pas participer au deuxième tour. Les comportements des candidats en ophtalmologie devraient faire l'objet d'études plus approfondies afin d'expliquer nos résultats.

Introduction

The steady increase in unmatched medical graduates has been a concern in recent years, resulting in the criticism of The Canadian Resident Matching Service (CaRMS) and Undergraduate Medical Education (UGME).¹ Studies have explored biases in the resident selection process,² as Canadian residency programs rely less on objective measures (e.g., publications or academic performance) than in the United States (US), and more on subjective indices.³ In the 2022 CaRMS cycle, 22 Canadian applicants whose first choice discipline was ophthalmology went unmatched after the first iteration.⁴ This was the highest number of first choice applicants to any surgical specialty going unmatched, while ophthalmology represents less than two percent of available positions each year. CaRMS provides application and match services to over 30 specialty entry level postgraduate training programs in Canada through two iterations. Unmatched applicants during the first iteration may participate in the second iteration, which consists of all unfilled seats following the first iteration.⁴

Non-identifiable data related to the match process for over 50 years is accessible on the CaRMS website.⁴ While studies have explored trends in ophthalmology match outcomes,^{5,6} we found no studies conducting a comparative analysis of unmatched rates or related application behaviour data between surgical or other competitive specialties. The financial and emotional repercussions of going unmatched in any specialty can be severe, and in rare instances even lead to significant mental health challenges.⁷ Implementing evidence-informed residency application and selection processes,⁸ while a first step, may not decrease the rate of applicants going unmatched. Our research aims to determine if any disparities or trends exist in the match outcomes of ophthalmology applicants during the CaRMS process through a comparison to other competitive and surgical specialties. This research may identify disparities that inform targeted interventions to improve the match process for aspiring ophthalmologists.

Methods

Study design

We conducted a cross-sectional analysis of CaRMS data available on the residency match over the past 10 CaRMS cycles from 2013-2022. This study was exempted from requiring ethics approval by the University of British Columbia Behavioural Research Ethics Board (BREB).

Sampling methods

We extracted data from the CaRMS R-1 “Data and reports” web page. Our data looks exclusively at Canadian Medical Graduate (CMG) applicants. We analyzed ophthalmology CaRMS data in comparison to both surgical disciplines (cardiac surgery, general surgery, neurosurgery, obstetrics and gynecology, orthopedic surgery, otolaryngology, plastic surgery, urology, and vascular surgery), as well as the top five most competitive non-ophthalmology disciplines, whether surgical or non-surgical. We defined the top five most competitive specialties as those with the highest ratio of applicants to quota number of seats available over the 2013-2022 study period: plastic surgery, dermatology, emergency medicine, otolaryngology, and urology. Programs that did not offer positions every cycle during the study period were excluded.

Sample size

We collected data on first choice applicants to ophthalmology (608), surgical specialties (5,153), and the top five most competitive specialties (3,092).

Statistical analysis

We applied the chi-square contingency test to analyze associations between first choice applicants to ophthalmology, surgical specialties, and the top five most competitive specialties and the following outcomes: going unmatched, ranking no other discipline, matching to an alternate discipline, and not applying to the second iteration of the CaRMS match process. We calculated absolute differences by subtracting the proportions at the end of the study period (2022) from the beginning (2013). We used the two-tailed Cochran-Armitage trend test to assess the change in proportions over time. P-values less than 0.05 were considered statistically significant. All statistical analyses were conducted using R version 4.2.1.

Results

Over the study period, first choice ophthalmology applicants were more likely to go unmatched (18.9% [120/608]), than applicants to the top five most competitive (11.9% [371/3,092]) and surgical (13.5% [702/5,153]) specialties ($\chi^2 = 26.23$, $p < 0.001$). The proportion of first choice ophthalmology applicants going unmatched has significantly increased (8.3% v. 29.0%; absolute difference +20.7%; $p = 0.002$), while no significant increases were observed for the top five most competitive (9.3% v. 11.2%; absolute difference +1.9%; $p = 0.81$) and surgical (12.8% v. 16.4%; absolute difference +3.61%; $p = 0.06$) specialties from the 2013 to 2022 application cycle (Figure 1A).

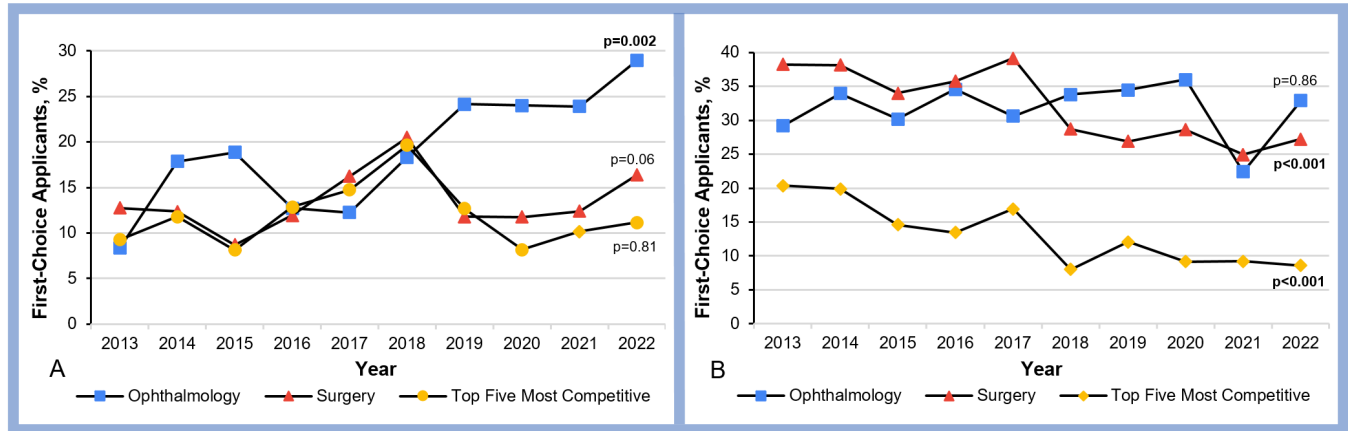


Figure 1. A) Percentage of first choice applicants to discipline who went unmatched in the first iteration; B) Percentage of first choice applicants to discipline who ranked discipline only. P values are from the Cochran Armitage trend test.

The average proportion of first choice applicants ranking no alternate disciplines was more than twice as high for applicants to ophthalmology (31.8% [194/608]) than applicants to the top five most competitive specialties (13.2% [405/3,092]), but comparable to applicants to surgical specialties (32.17% [1,653/5,153]) ($\chi^2 = 381.45$, $p < 0.001$). The proportion of first choice ophthalmology applicants ranking no alternate disciplines has not significantly changed (29.2% v. 32.9%; absolute difference +3.7%; $p = 0.86$), while proportions have significantly decreased for the top five most competitive (20.4% v. 8.6%; absolute difference -11.8%; $p < 0.001$) and surgical (38.3% v. 27.2%; absolute difference -11.1%; $p < 0.001$) specialties over the study period, as plotted in Figure 1B.

Over the study period, the proportion of first choice applicants matching to an alternate discipline during the first iteration was 18.9% (120/608) for ophthalmology, 31.2% (967/3,092) for the top five most competitive specialties, and 17.95% (928/5,153) for surgical specialties ($\chi^2 = 196.82$, $p < 0.001$). Interestingly, the match rate to alternate disciplines in the first iteration is highest for ophthalmology applicants (0.41), followed by applicants to

the top five most competitive (0.36) and surgical (0.27) specialties ($\chi^2 = 64.82$, $p < 0.001$).

The average proportion of first choice applicants who went unmatched during the first iteration and subsequently did not apply to the second iteration was 13.8% (48/347) for ophthalmology, 3.2% (49/1,547) for the top five most competitive specialties, and 5.2% (136/2,624) for surgical specialties ($\chi^2 = 67.45$, $p < 0.001$). Figure 2D illustrates the opt-out rate during the second iteration, as a percentage of unmatched first choice applicants following the first iteration (i.e., as opposed to the opt-out rate of total first choice applicants). Applicants to ophthalmology exhibit a second iteration opt-out rate of 57.8%, compared to 35.1% and 24.9% for the top five most competitive specialties and surgical specialties respectively ($\chi^2 = 86.73$, $p < 0.001$). The second iteration opt-out rate has increased more (46.2% v. 68.2%; absolute difference +22%; $p = 0.30$) for ophthalmology applicants, compared to applicants to the top five most competitive specialties (16.7% v. 31.4%; absolute difference +14.7%; $p = 0.19$), and surgical specialties (31.6% v. 39.3%; absolute difference +7.7%; $p = 0.19$), as shown in Figure 2D.

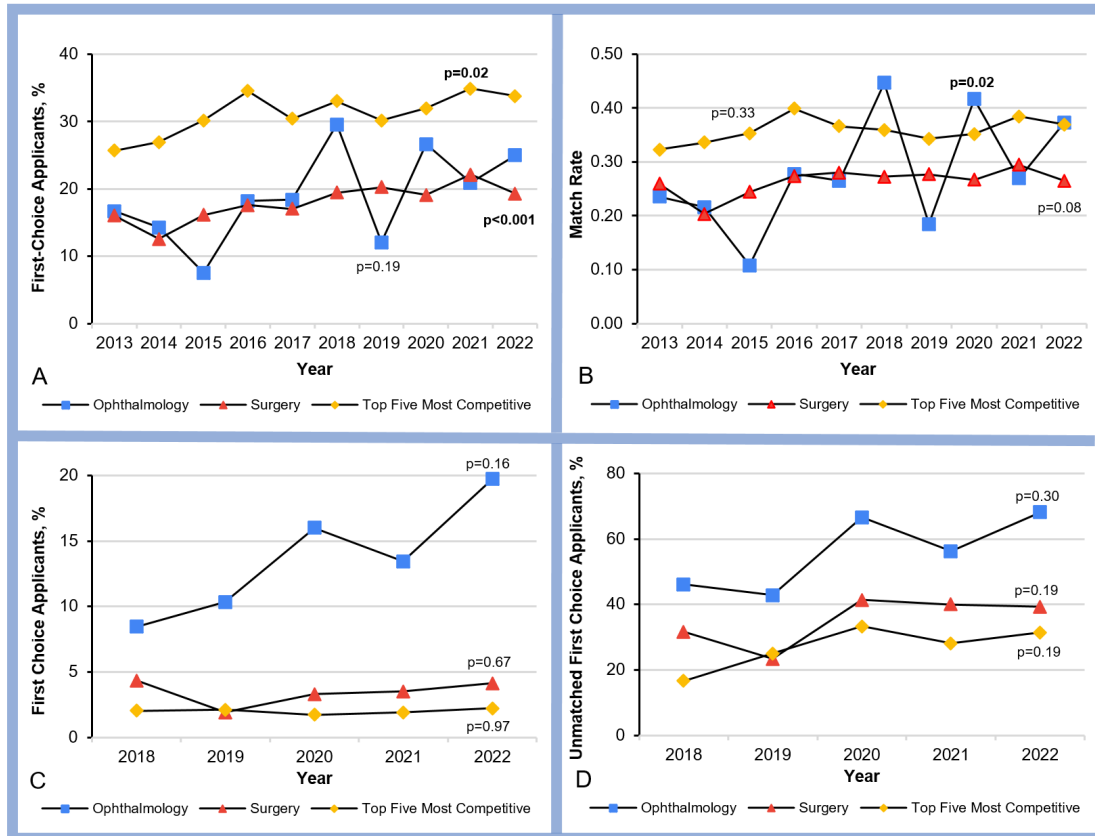


Figure 2. (A) Percentage of first choice applicants to discipline who matched to an alternate discipline in the first iteration; (B) Match rate of first choice applicants who applied to an alternate discipline in the first iteration*; (C) Percentage of first choice applicants to discipline who did not participate in the second iteration**; (D) Percentage of unmatched first choice applicants to discipline who did not participate in the second iteration.**

*This was calculated as the number of applicants who matched to an alternate discipline divided by those who applied to alternate disciplines. **Previous data unavailable, as this data first began being reported in 2018. P values are from the Cochrane Armitage trend test.

Discussion

This study presents compelling evidence of ophthalmology applicants going unmatched at a higher rate than other competitive or surgical specialties. While supports exist for unmatched applicants,⁹ going unmatched results in tremendous anxiety and career uncertainty.^{10,11} Despite this, applicants to ophthalmology are less likely than applicants to other surgical or competitive specialties to rank alternate disciplines, resulting in a lesser proportion of ophthalmology applicants matching to alternate disciplines. When ophthalmology applicants ranked alternate disciplines, the success rate was higher than in both comparison groups.

Applicants to ophthalmology were also more likely than comparison groups to not participate in the second iteration after going unmatched in the first iteration, with over half choosing not to participate in the second iteration. These applicant behaviours, characterized by inflexibility, ultimately contribute to the risk of remaining

unmatched throughout the entire CaRMS process and are less frequent among applicants to other surgical or competitive specialties. The exact reasons for this phenomenon are unknown, and further qualitative studies involving applicants may offer valuable insights into why applicants to ophthalmology are less inclined to parallel plan compared to their peers.

One possible contributing factor is lack of adequate planning, which may lead applicants to completely forgo parallel planning.¹² In this regard, it would be beneficial for UGME stakeholders to explore the effectiveness of pre-clerkship workshops in providing practical strategies to support parallel planning, as suggested by the Association of Faculties of Medicine of Canada (AFMC).¹³ Other factors contributing to going unmatched may include not being competitive in a first-choice specialty, lack of preparedness for interviews, or not ranking enough programs.¹⁴

The AFMC Student Elective Diversification Policy promotes parallel planning by limiting students to eight weeks of electives in any single entry-level discipline.¹⁵ A study at the

University of British Columbia examining elective diversification and match rates found an unclear correlation between elective diversification and match outcomes, suggesting that "...a viable back-up plan may reside in the application as a whole, rather than solely in the elective selection process."¹⁷ Research into whether the Student Elective Diversification Policy has led to increased parallel planning may provide insight into the efficacy of these policies. No studies to our knowledge have explored effective strategies for promoting parallel planning at the Post-Graduate Medical Education (PGME) level. Possible strategies include requiring at least one reference letter from a specialty other than their own, and valuing research in unrelated disciplines equally. Implementation of these strategies, if shown to be effective, would require coordinated efforts at the PGME level.

This study is limited to reporting findings based solely on CaRMS data and does not suggest insight into the individual motivations of applicants. The reasons behind the higher proportions of ophthalmology applicants not ranking other specialties during the first iteration and dropping out during the second iteration compared to their peers remains unclear. Further research is needed to better understand motivations for ophthalmology applicant behaviour in comparison to other applicant groups. This research should involve both past and prospective applicants to ophthalmology and other competitive specialty programs.

Conclusions

First choice ophthalmology applicants have higher rates of going unmatched in the CaRMS application process. This can be attributed, at least in part, to ophthalmology applicants being less likely to rank alternate disciplines and choosing to not participate in the second iteration. Additional research is needed to explore ophthalmology applicant behaviours and gain a deeper understanding of our study's findings.

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