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The race that never slows: Otolaryngology - Head and Neck Surgery residency applicant parameters over time
Une course sans répit : l'évolution des paramètres des candidats à la résidence en oto-rhino-laryngologie – chirurgie cervico-faciale au fil du temps

Kaylie Schachter, Ashley Tritt ⒾⒹ, Meredith Young ⒾⒹ, Jessica Hier, Emily Kay-Rivest ⒾⒹ, Gabriella Le Blanc ⒾⒹ et Lily HP Nguyen ⒾⒹ

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Résumé de l'article

Contexte : De plus en plus de diplômés en médecine canadiens demeurent non jumelés à l'issue du processus de sélection des résidents. Certains font des activités hors programme afin de se distinguer de leurs pairs dans le processus de sélection. Pour comprendre comment la compétition dans la sélection de résidents influence les caractéristiques démographiques et les comportements des candidats, cette étude visait à explorer l'évolution des caractéristiques démographiques et la prévalence d'activités hors programme déclarées par les candidats à la résidence en oto-rhino-laryngologie – chirurgie cervico-faciale (ORL-CCF) à travers le temps.

Méthodes : Dans le cadre d'une étude rétrospective et descriptive, nous avons parcouru des sections pertinentes du curriculum vitae (CV) des candidats aux programmes d'oto-rhino-laryngologie et chirurgie cervico-faciale au Canada. Ces sections étaient auto-déclarées et comprenaient les activités de recherche, la participation à des activités de bénévolat et de leadership, l'appartenance à des associations et les prix et distinctions obtenus. Les données ont été quantifiées et analysées de manière descriptive.

Résultats : Entre 2013 et 2017, un total de 267 candidats ont déclaré une médiane de 12,6 publications de recherche, 9,6 activités de bénévolat, 6 activités de leadership, 6 adhésions à des associations et 9,8 prix et distinctions. Au fil du temps, on observe que les candidats sont de plus en plus jeunes ; ainsi, la proportion de candidats âgés de 30 ans et plus a diminué de 56 % en 2013 à 9 % en 2017.

Conclusion : Les candidats aux programmes de résidence en ORL-CCF au Canada déclarent d'une année à l'autre un nombre élevé d'activités hors programme et sont de plus en plus jeunes. Les étudiants en médecine investissent beaucoup de temps et d'énergie dans ces activités qui vont au-delà du programme d'études officiel. Cela pourrait nuire à la diversité des candidats aux programmes de résidence fortement contingentés, augmenter la probabilité de fausses déclarations dans les demandes de résidence et probablement contribuer à l'épuisement professionnel des étudiants en médecine

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Abstract

Background: There has been an increasing number of Canadian medical graduates who have gone unmatched in the residency selection process. Medical students have been engaging in extracurricular activities outside the formal curriculum which may help to distinguish themselves from their peers in the selection process. To understand how competitiveness in residency selection shapes applicant demographic characteristics and behaviours, this study set out to explore the demographic characteristics and prevalence of reported extra-curricular activities by applicants to Canadian Otolaryngology – Head & Neck Surgery (OTL-HNS) residency across time.

Methods: A retrospective, descriptive study reviewed specific sections of the curriculum vitae (CV) of applicants to OTL-HNS programs in Canada. These sections were self-reported, and included research productivity, involvement in volunteer and leadership activities, membership in associations, and honours or awards granted. Data was quantified and analyzed descriptively.

Results: Between 2013 to 2017, a total of 267 applicants reported a median of 12.6 research publications, 9.6 volunteer activities, six leadership activities, six association memberships and 9.8 honours/awards. Applicants were younger over time, with proportions of applicants over 30 years old decreasing from 56% in 2013 to 9% in 2017.

Conclusion: Applicants to Canadian OTL-HNS residency programs are reporting consistently high numbers of extracurricular activities and were of increasingly younger ages. Medical students are investing significant time and energy to pursue these activities which are above and beyond the formal curriculum, possibly contributing to decreased diversity in applicants for competitive residencies, increasing the likelihood of misrepresentation in residency applications, and likely contributing to medical student burnout.

Résumé

Contexte : De plus en plus de diplômés en médecine canadiens demeurent non jumelés à l'issue du processus de sélection des résidents. Certains font des activités hors programme afin de se distinguer de leurs pairs dans le processus de sélection. Pour comprendre comment la compétition dans la sélection de résidents influence les caractéristiques démographiques et les comportements des candidats, cette étude visait à explorer l'évolution des caractéristiques démographiques et la prévalence d'activités hors programme déclarées par les candidats à la résidence en oto-rhino-laryngologie – chirurgie cervico-faciale (ORL-CCF) à travers le temps.

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Introduction

Senior medical students across Canada feel the pressure of preparing for the residency selection process, differentiating themselves from their peers to increase the likelihood of success, while balancing the challenges of their ongoing medical education.[1] The pressure of the residency selection process has intensified in recent years, as there has been an increase in the number of Canadian medical graduates who have gone unmatched. Otolaryngology – Head and Neck Surgery (OTL-HNS) has historically received high numbers of applicants compared to its limited number of residency positions, making it consistently one of the top five most competitive specialties in Canada.[1] From 2008 to 2020, the number of applicants to surgical disciplines increased while the available positions decreased. In 2020, the ratio of available positions to applicants who ranked OTL as their first choice was 0.67.[2] In the United States, escalating numbers of applications to OTL-HNS resulted in the greatest number of unmatched medical students applying to a single specialty at 21.5% in 2013.[3,4] In addition, curriculum vitae of successfully matched applicants are increasingly impressive. Hauser et al. (2017) analyzed applicant factors associated with matching to an otolaryngology program in the USA. The authors found that indicators of academic achievement, such as receiving awards, number of publications, higher scores on the USMLE step 1, were associated with higher odds of matching.[3] In 2014, successfully matched OTL-HNS applicants scored an average of 248 on the United States Medical Licensing Examination (USMLE) Step 1, higher than all other specialties.[5] However, Bowe et al. (2017) demonstrated the ambiguity in the evidence as to whether these factors correlate with residency success.[6] It is perhaps not surprising that 80% of graduating medical students surveyed at one university felt it was "impossible" or "near impossible" to match into OTL-HNS.[7]

Given the competitive nature of OTL-HNS programs, the increasing number of applicants and Canadian medical schools shifting to primarily pass/fail grading, we set out to explore the types of activities medical students are pursuing outside of the formal medical school curriculum in order to distinguish themselves from their colleagues. In other words, we asked; what are applicants doing in order to increase their likelihood of a successful match to OTL-HNS programs? As a window into student behaviours in a competitive residency selection process, we sought to document the demographic characteristics of applicants and the nature and amount of extracurricular activities reported in the curriculum vitae (CV) section of applications to Canadian OTL-HNS residency programs across time.

Methods

Ethical approval was granted by the Institutional Review Board (IRB) of McGill University (Montreal, Canada), and was exempted by the IRB of University of Illinois in Chicago (Chicago, USA) for non-human research. The CaRMS Research and Data Committee provided written consent to quote their online statistics, and all data derived from applicant curriculum vitae was released by CaRMS for the sole purpose of this research project.

Study context

Medical students apply to Canadian residency programs through the CaRMS website via a standardized and centralized electronic application form.[8] Similar to a CV, the form documents information regarding applicant's education, academic, clinical, and extracurricular activities. Portions of the application are confirmed by third parties, such as the written documentations of university transcripts, dean's letters, and letters of reference. However, a portion of the application is self-reported, including research experience, involvement in leadership positions and other extracurricular activities – these self-reported components are the focus of the current study. Following a formal interview process, applicants submit a ranked list of programs of choice, while residency programs independently submit their list of applicants of choice, and a centralized match is then made between applicants and programs.

At the time of this study, there were 17 medical schools and 13 OTL-HNS residency programs across Canada. Similar to Sater et al., we chose to study applicants to OTL- HNS programs as it is consistently one of the top-five most competitive specialty in Canada.[1, 9] Highly competitive specialties are defined as specialties with low percentages of first-choice applicants gaining entry into their discipline of choice. Each year, CaRMS publishes application and match statistics.[8]

Study design

A retrospective, quantitative descriptive study was designed to harvest specific sections of the curriculum vitae of applicants to OTL-HNS programs in Canada between 2008 to 2017 to examine applicant demographic characteristics and behaviours across time. These sections

were self-reported by applicants and reflect extracurricular activities that are left up to the discretion and reporting of the applicant (i.e., it is not verified by a third party), and are not explicitly assessed in the medical school curriculum and are left up to the discretion and reporting of the applicant.

Data sources

Data were released from CaRMS to the research team in three separate unlinkable files. One data file was used to quantify the competitiveness of OTL-HNS residency positions, one data file described the demographic characteristics of applicants, and one data file included the quantified data for the requested extracurricular activities, provided as means and standard deviations for various extracurricular activities.

To quantify the competitiveness of OTL-HNS as a discipline during the range of time included in our study, the following data were obtained: 1) number of applicants to OTL-HNS per year, 2) number of applicants who ranked OTL-HNS as their first choice, 3) number of applicants matched to OTL-HNS, 4) number of applicants who ranked OTL-HNS as their first choice but matched to another specialty or were unmatched, and 5) number of OTL-HNS programs applied to per applicant.

To assess demographic characteristics over time, CaRMS released summaries of applicant demographic characteristics for each year of data requested including age, gender, number of languages spoken, and number of academic degree(s) obtained prior to medical school.

In order to document applicants' reported extracurricular activities, data was provided according to the following CaRMS categorizations:

1) Publication/Presentation (paid or unpaid involvement in research projects, such as abstracts, posters, and podium presentations, where the student is cited as an author or contributor. Students are encouraged but not mandated to upload documentation or provide links attesting to authorship/contribution),

2) Scholarly Activities and Research Experiences (paid or unpaid experiences including clinical discussions, research experiences, rounds, journal club, and conferences that has not resulted in a publication or presentation),

3) Volunteer Activities (relevant unpaid work where the student has not received school credit),

4) Leadership positions held,

5) Membership in Associations / Committees,

6) Honours and Awards (academic achievements where students are encouraged to provide the title, date and brief description of the honour/award).

No other data was shared (i.e. no Medical Student Performance Record (also called "Dean's letter"), no letters of references). We chose to exclude these data sources as we were interested in the extracurricular activities outside of the standard medical curriculum, and determined that these were available in the most standardized format in the abovementioned sections (i.e. not dependent on decoding the content of reference letters), without the risk of identifying information on the applicants included in this retrospective analysis.

Data security and data reduction

CaRMS assumed responsibility for preserving the anonymity and confidentiality of each of its applicants, and to provide data security for all information contained within the CaRMS match. Thus, for the purposes of this study, CaRMS disclosed only summary quantitative data for each of the parameters requested. For example, the total number of research publications were reported, but titles of projects and authorship order were not released in order to maintain applicant anonymity. Hence, duplication, quality, and veracity of items could not be confirmed, and remains beyond the scope of this study.

Given the relatively small pool of applicants per year to OTL-HNS programs, data were provided as summary tables for a given application year. In cases where sample size was deemed too small, CaRMS withheld the information (i.e. of the unmatched subgroup of applicants). Age was grouped by CaRMS into two groups; those between the ages of 20-29 years old (20-29yo), and those over 30 years old (+30yo) in order to preserve anonymity. There were no applicants younger than 20 years old. At no point were authors made aware of any names or demographic characteristics of individual applicants that would allow for applicant identification. We requested the abovementioned data across a 10-year span to increase the generalisability of our findings and examine potential trends over time, and to ensure that those included in our data pool were not current applicants nor learners.

Data analysis

Descriptive analyses were performed, producing mean, median, mode, range, and standard deviation as appropriate. Median, rather than mean, was reported when we sought to minimize the effects of potential

outliers (i.e. in cases of skewed data or large data ranges) as appropriate.

Results

In 2013, CaRMS changed its data collection format, and thus was able to provide complete data (i.e. applicant demographics and CV parameters) for the five-year period from 2013-2017. Between 2008-2012, only data regarding competitiveness of OTL-HNS as a specialty was provided.

Competitiveness of OTL-HNS

Between 2008-2017, a total of 507 medical students applied to the 295 available OTL-HNS residency positions within the 13 programs across Canada (Table 1). This represents an average of 50.7 applicants per year (range 44-61) and an average of 29.5 available residency positions per year (range 28-31). Only 287 (56%) applicants matched to OTL-HNS (range 48-64%).

Amongst all applicants to OTL-HNS, 79% (*n* = 401) ranked OTL-HNS as their first-choice specialty. Of those who ranked OTL-HNS first, 30% of applicants (range 20-38%)

were either left unmatched or matched to a program other than OTL-HNS (Table 1). Each year, Canadian medical school graduates applied to a mean of 7.5 (standard deviation = 6.2) residency programs.

Demographics of applicants

There was a total of 44 to 61 individuals per year who submitted an application to OTL-HNS residency programs across Canada from 2013-2017, with a total of 112 females and 155 males. Female representation remained relatively consistent over the five-year period, ranging from 36% to 46%. Applicants spoke an average of 2.1 languages and held an average of 1.7 undergraduate and 1.6 graduate degrees at the time of application (Table 2).

There was a steady decrease in proportions of applicants over the age of 30 (Figure 1) across time. In 2013, 56% (*n* = 31) of all OTL-HNS applicants were over 30 years-old, with subsequent years showing results of 30% (*n* = 13), 28% (*n* = 17) and 11% (*n* = 6) respectively. By 2017, this age group represented only 9% (*n* = 5) of applicants to Canadian OTL-HNS programs.

Table 1. Competitiveness of OTL-HNS residency programs in Canada

Match Year	Available residency positions *n*	Total applicants that ranked OTL-HNS *n*	Applicants matched to OTL-HNS *n* (%)	Applicants who ranked OTL-HNS as 1st choice *n* (%)	Applicants who ranked OTL-HNS as 1st choice, but matched to non-OTL programs or who remained unmatched *n* (%)	Number of Programs an Individual Applied to mean (±SD)
2008	30	48	29 (60%)	35 (73%)	7 (20%)	7.0 (± 4.8)
2009	28	49	28 (57%)	41 (84%)	14 (34%)	6.6 (±6.2)
2010	30	45	29 (64%)	37 (82%)	9 (24%)	6.0 (±3.1)
2011	29	56	29 (52%)	43 (77%)	14 (33%)	6.6 (±6.5)
2012	31	51	31 (61%)	41 (80%)	11 (27%)	6.0 (±5.8)
2013	30	53	29 (55%)	41 (77%)	14 (34%)	10.3 (±19.0)
2014	30	43	28 (65%)	35 (81%)	8 (23%)	6.6 (±3.4)
2015	30	59	29 (49%)	47 (80%)	18 (38%)	7.2 (±13.7)
2016	29	52	29 (56%)	42 (81%)	13 (31%)	11.0 (±19.7)
2017	28	51	26 (51%)	39 (76%)	12 (31%)	7.9 (±9.6)
Average	29.5	50.7	28.7 (57%)	40.1 (79%)	12.0 (30%)	7.5 (±6.2)

Table 2. Demographic characteristics of applicants to OTL-HNS residency programs

Match Year	Total applicants* *n*	Female *n* (%)	Over 30 years old *n* (%)	Languages spoken mean (range)	Undergraduate degrees mean (range)	Graduate degrees mean (range)
2013	55	23 (42%)	31 (56%)	2.0 (1-4)	1.6 (1-6)	1.4 (1-3)
2014	44	16 (36%)	13 (30%)	2.1 (1-4)	1.7 (1-4)	1.8 (1-3)
2015	61	25 (41%)	17 (28%)	2.0 (1-4)	1.6 (1-6)	1.5 (1-4)
2016	54	25 (46%)	6 (11%)	2.1 (1-5)	1.7 (1-6)	1.8 (1-6)
2017	53	23 (43%)	5 (9%)	2.1 (1-5)	1.9 (1-4)	1.6 (1-2)

Defined as individuals who submitted an application to OTL-HNS but did not submit their final rank list to CaRMS yet.
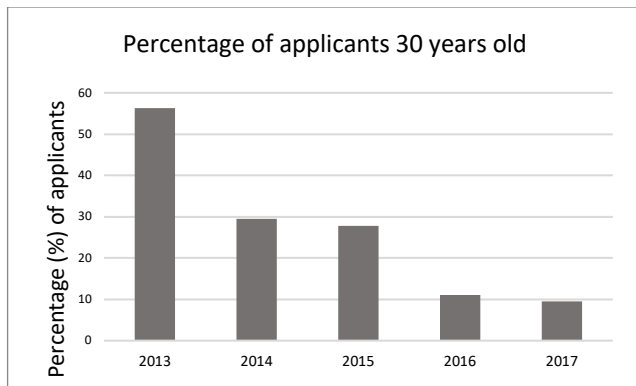
Figure 1. Number of applicants to OTL-HNS over 30 years old

Figure 2a. Number of publications / presentations reported by applicants to OTL-HNS residency programs

Extracurricular activities

Between 2013 and 2017, applicants self-reported a range of medians from 10 to 16 items under the "Publications" section (mean of medians 12.6), with at least one student per year reporting a minimum of 46 publications (maximum 156 across the study period). All applicants to OTL-HNS programs within our study period reported a minimum of two publications (Figure 2a). Regarding research experience, applicants reported a range of medians of 10 to 12 research projects (mean of median 10.4). All students were involved in at least two scholarly activities, with at least one applicant per year reporting a minimum of 28 projects (maximum 74) (Figure 2b).

Participation in volunteer and leadership activities was also high, with self-reported a mean of medians of 9.6 (range 8-12) and 6.0 (range 6-6) respectively. Each year, applicants were reporting a minimum of two volunteer and two leadership activities, with the maximum reported involvement ranging from 22 to 56, and 18 to 24, respectively (Figures 2c and 2d).

OTL-HNS applicants were members in at least two associations, up to a maximum of 12-34 per year, with a reported mean of medians of six associations (range 4-8). The mean of medians for number of honours / awards held was 9.8 (range 8-12), with a minimum of two and a maximum of 32-44 (Figures 2e and 2f).

Over time, the trend in the average number of extracurriculars (research projects, publications, leadership activities and volunteer activities) was relatively steady with high mean and median values (dotted line seen in Figures 2a-2f).
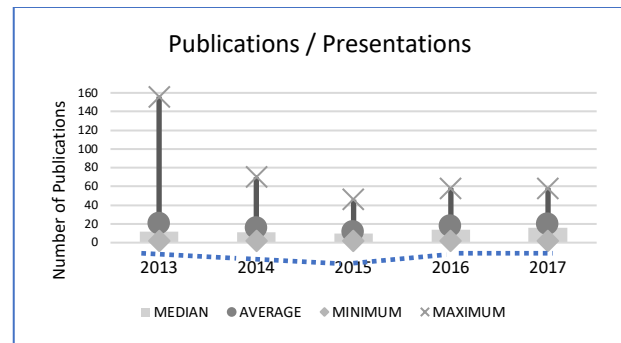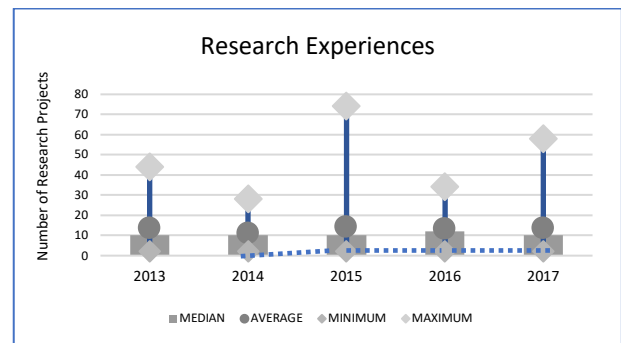

Figure 2b. Number of scholarly activities and research experiences reported by applicants to OTL-HNS residency programs
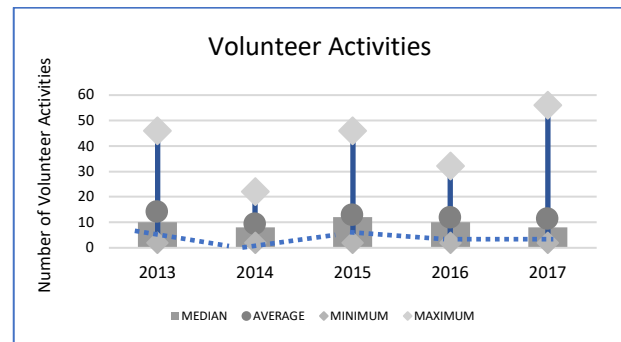

Figure 2c. Number of volunteer activities reported by applicants to OTL-HNS residency programs
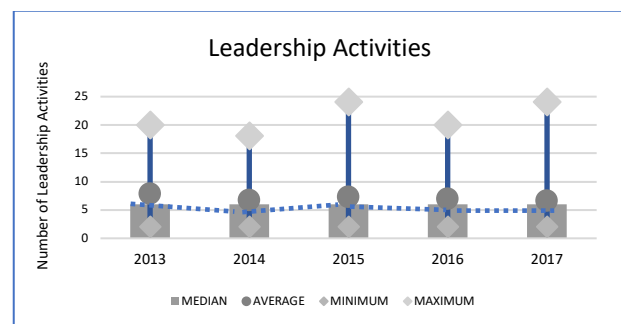

Figure 2d. Number of leadership activities reported by applicants to OTL-HNS residency programs
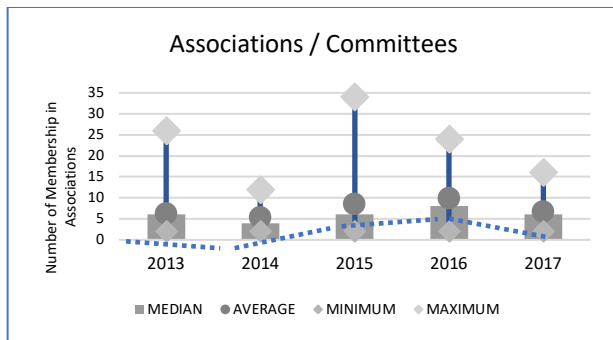
Figure 2e. Number of association and committee memberships reported by applicants to OTL-HNS residency programs
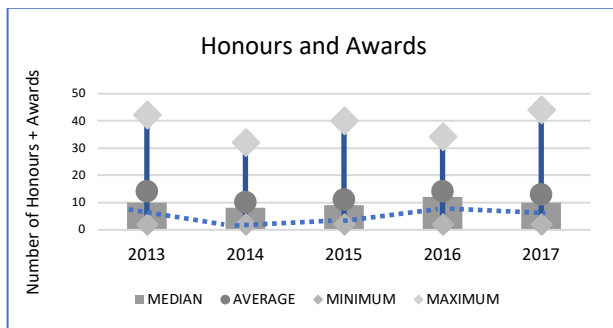

Figure 2f. Number of honours and awards reported by applicants to OTL-HNS residency programs

Discussion

To better understand the competitiveness of OTL-HNS residency positions, we examined the extracurricular activities reported on the curriculum vitae by applicants to Canadian OTL-HNS residency programs. Between 2013 to 2017, a total of 267 applicants reported a median of 12.6 publications, 10.4 research activities, 9.6 volunteer activities, six leadership activities, six association memberships and 9.8 honours / awards. Applicants applied to an average of 7.5 residency programs. Approximately one-third of applicants who ranked OTL-HNS as their first choice went unmatched or matched to another specialty. This places OTL-HNS among the most competitive specialties in Canada, with match rates lower in only Plastic Surgery, Dermatology, Emergency Medicine and Ophthalmology— Kay-Rivest et al. (2017) provide a more comprehensive analysis of this data in a study examining the competitiveness (percentage of medical students gaining entry into their discipline of choice) of a variety of specialities in Canada.[1] Applicants also appear to be getting younger overall, with a decrease in proportions of applicants over 30 years old.

In addition to the formal academic requirements of medical school, applicants are investing significant time and effort into participating in extracurricular activities.

While our findings align with others, the number of extracurricular activities reported in our study are amongst the highest documented from various surgical fields.[10-14] Our data include all applicants (not just successfully matched ones), which differs from previous work, and as such, we are unable to identify if the students who matched OTL-HNS were those with the highest number of extracurricular activities.[10-14] Abraham et al. reviewed the CVs of successfully matched applicants to five surgical residency programs, which showed an increase in scholarly output from students over time.[12] In contrast, quantity of extracurricular activities across various domains in our study, although high, were relatively stable across the study period captured. Given the decrease in older applicants across time, which has not been observed in other specialties, this suggests that Canadian OTL-HNS applicants are generating a long list of accomplishments at an increasingly younger age.[15]

The declining age of applicants to OTL-HNS residency programs may have several explanations, but without further research these remain speculative at best. One explanation could be that the decreasing age of applicants mirrors the decreasing age in undergraduate medical education cohorts. When looking at demographic characteristics of applicants to Canadian medical schools in general, we do not see a similar decrease in age over time. Data published by the Association of Faculties of Medicine of Canada (AFMC) report that in 2007, 12.6% (1448/11522) of applicants were greater than 28 years old, and 12.4% in 2017.[15] This suggests that the decline in age of applicants to OTL-HNS cannot be explained by a shift in demographics of medical students overall. Another potential explanation is that older applicants are self-selecting out of the match process, not wanting to (or unable to) invest the time and energy required to "play the game" necessary to successfully match. Hauser et al, in their study of 1479 unique applications to OTL-HNS, reported that applicants older than one standard deviation above the mean were disadvantaged, and suggested counseling them to excel in multiple other parameters if they hoped to be effective contenders.[3] As a result, the field of OTL-HNS may be missing out on an important population who may represent those who have caregiving responsibilities, who have embarked on non-traditional career paths, who acquired prior work experience, and who can offer unique perspectives. As we strive for increased diversity in our workforce, we should be mindful to not lose this *"different type of diversity—that of thought."*[14]

Our study was designed to be a descriptive examination of the amount of activities that applicants are reporting in the context of the residency selection process. Due to the small number of applicants across time, a rich longitudinal analysis was not possible, however, despite this limitation, a graphical representation of applicants' extracurricular involvement over time shows a relatively flat curve, suggesting that between 2013 and 2017, the volume of extracurricular activities reported by OTL-HNS applicants has been stable. However, when considering this information in conjunction with the decline in the age of applicants, this suggests that students are producing extensive CVs in increasingly shorter time frames. We were not able to determine whether these accomplishments originate prior to medical training, as there is little available data which explicitly investigates the trends in extracurricular involvement of students applying to undergraduate medicine programs. In one study, most applicants considered research involvement to be an important portion of their application, with 87% of surveyed students reporting research activities prior to their admission.[16] In an increasingly competitive admissions environment, one may assume that, given the perceived importance of research involvement for admission to undergraduate medicine programs, there may be a higher number of publications originating prior to medical school. While application data from applicants to other specialties is not widely available, some available literature demonstrates just how high these numbers are. In 2019, University of Saskatchewan surveyed a sample of their successfully matched 4th year medical students and found that an aggregate of applicants to low availability/high demand specialties (such as dermatology and emergency medicine) reported a mean of 2.2 publications and 3.75 research presentations.[17] An American study on applicants to dermatology residency demonstrated mean number of publications in successfully matched applicants was 3.4 in 2007 and 4.3 in 2017.[18] Our results from 2017 in OTL-HNS show a mean more than four-fold greater, at 19.3 publications. Although the definition of "publication" reported in these studies may vary from ours, the energy expended on publications reflected in residency selection applications is clear.

The pressure experienced by medical students to assemble such lengthy and impressive applications, bursting with extracurricular activities above and beyond the required curriculum, may give rise to several unintended and negative consequences. The pressure to excel in comparison to your peers may be one contributing factor to burnout in medical students.[19,20] Another potential consequence is unprofessional behaviour arising during the application process, which may present itself in various forms. Our group demonstrated in a nationwide study that 23% of applicants to OTL-HNS residency programs misrepresented their research publications by falsely claiming authorship of an existing article, claiming authorship of a non-existing article, or improper ordering of authorship.[9] While steps have been made to make misrepresenting authorship more difficult, other forms of misrepresentation or unprofessional scholarly behaviour may be being encouraged by the "arms-race" of residency application for competitive programs. Lastly, the declining number of applicants who were over thirty to OTL-HNS residency programs found in our study, suggests that there is diminishing diversity amongst applicants.

As applicants are striving to differentiate themselves from their peers, programs are also striving to find ways to differentiate amongst the wealth of high caliber candidates. Findings from this study have led us to generate several hypotheses about the potential unintended consequences of the highly competitive otolaryngology programs for the individual applicants–from misrepresentation on applications to a potential contributor to student burnout. However, these findings also have meaning for programs as well. As OTL-HNS programs continue to be part of the top-most competitive specialties across Canada, otolaryngologists must be aware of potential consequences. In 2017 and 2018, OTL-HNS programs across the United States had less ranked US medical seniors compared to available positions, resulting in unfilled positions.[21,22] Bhalla et al (2018) hypothesized that two of the main contributing factors were "(1) medical students' perception of what is required to successfully match in otolaryngology and (2) a selection process that is cumbersome and too narrowly focused on metrics that do not necessarily correlate to future performance as a clinician."[23]

With shifting demographic characteristics of applicants, the complexities of rankings for both applicants and programs, our findings should also be an opportunity for reflection. While beyond the scope of our study, one could speculate as to how selecting applicants (whether directly or not) for productivity may impact later scope of practice? Does selecting those with rich research and leadership profiles fulfill important workforce needs such as community-based practice following academic-centre focused training? While entirely speculative, considering

the unintended negative consequences of the residency selection process in a competitive specialty may allow opportunity for careful reconsideration of the desired characteristics and behaviours of applicants, and careful attention to potential negative unintended consequences of residency selection practices.

Limitations

Our study has several limitations worth noting. First, data inputted to the CaRMS service relied on self-reporting by applicants which, when given the opportunity to list all relevant experiences, can lead to an overestimation of extracurricular activities and without raw data we are unable to assess the veracity of the self-reported activities included in our study. In balancing the protection of participants, all extracurricular activities were provided as aggregated quantitative data, thereby protecting participant identity, however limiting the inferences that can be drawn. The small sample size of applicants to Canadian OTL-HNS residency programs prohibited any potential subgroup analysis, such as comparing matched or to unmatched applicants, or applicants who ranked OTL-HNS as their first choice to those who did not. Finally, the study is unable to capture the influence of language, program, or institutional culture on outcomes, which is of particular importance since Canada is a country with two official languages.

Conclusion

Medical students applying to Canadian OTL-HNS residency programs are reporting a large number of research publications, leadership and volunteer positions, honours and awards, and other extracurricular activities, at increasingly younger ages. As residency selection committees struggle in differentiating among applicants with fewer objective metrics of academic success, students strive to become the "ideal" applicant by providing evidence of excellence through other criteria–from research to leadership to volunteerism. Our findings are limited to OTL-HNS residency programs; however we have no reason to believe that the pressure for demonstrating excellence is limited only to this specialty. Increasing competition for residency spots, paired with a decrease in applicant age, raises important considerations for how the residency selection process will continue to shape future generations of students, residents, and physicians in both intended and unintended ways.

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