

The Price of Fear: An Ethical Dilemma Underscored in a Virtual Residency Interview Season

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In May 2020, the Coalition for Physician Accountability recommended that all residency programs pivot to virtual interviews for the 2020–2021 season.¹ This kept more than 45 000 applicants from traveling cross-country during a pandemic, aiding social distancing efforts. Additionally, it removed travel costs, granting applicants the opportunity to assess more programs. With opportunity and human nature, however, comes the risk of an arms race, where a more open residency market compounds pressure on students to apply to more programs. The residency application process has gone down a behavioral economics rabbit hole, where fear and uncertainty are unnecessarily driving up applications, despite evidence of no benefit to applicants or programs. In what follows, we contextualize the growing problem of application inflation, describe contributing drivers including those introduced by virtual interviews, raise concerns about a conflict of interest for the application steward, and discuss potential solutions.

Growth in Residency Applications and Costs

For the past decade, applications to residency programs via the Electronic Residency Application Service (ERAS) grew steadily.² In 2019, US senior medical students averaged 64.9 applications, nearly twice as many as in 2009 (87% increase; FIGURE 1). That same year, international medical graduates (IMGs) submitted 136.5 applications on average, a 44% increase from 2009. Such application inflation might make sense if it improved the chance of matching, but it has not.^{3,4} US seniors have consistently matched at a 92% to 95% rate for decades despite the rise in applications, and Match rates for IMGs only improved by 15% over the past 10 years, reaching 59% by 2019.⁵ While application growth

has yielded little benefit, it has multiplied student costs. Adjusted for inflation, US seniors spent an average of \$1,409 on ERAS fees in 2019 (149% increase since 2009; FIGURE 1), while IMGs spent an average of \$3,281 (39% increase since 2009).^{2,6,7} These substantial increases in application costs translate into substantial revenue for the Association of American Medical Colleges (AAMC) which manages ERAS. Form 990 filings with the Internal Revenue Service show that ERAS fees are the AAMC's largest single revenue stream, which has doubled between 2009 and 2019 (\$47.6 million to \$94.2 million; 98% increase; FIGURE 2).⁸

Virtual Interviews Expose Flawed System

A shift to a virtual interview season may escalate senior medical students' fear of not matching.⁹ Loss of away electives and usual opportunities for signaling interest and developing advocates may also increase concern and applications. For programs, the existing application inflation was already burdensome, and a COVID-19-related surge will likely exacerbate challenges to evaluate candidates holistically.⁹ Specifically, programs may depend more on "easy-to-measure" benchmarks like test scores to stratify applicants, favoring high-scoring candidates. Indeed, previous years have shown that a small minority of applicants already receive a majority of interview offers. In 2016, an estimated 2.6% of family medicine applicants received 22% of total interview slots.¹⁰ Traditionally, these applicants are limited by travel costs and logistics, thereby allowing other applicants to receive offers. However, a virtual season removes most of these limitations. Without any intervention, the risk of unfilled residency positions in the initial Match increases as programs disproportionately interview the same subset of applicants.

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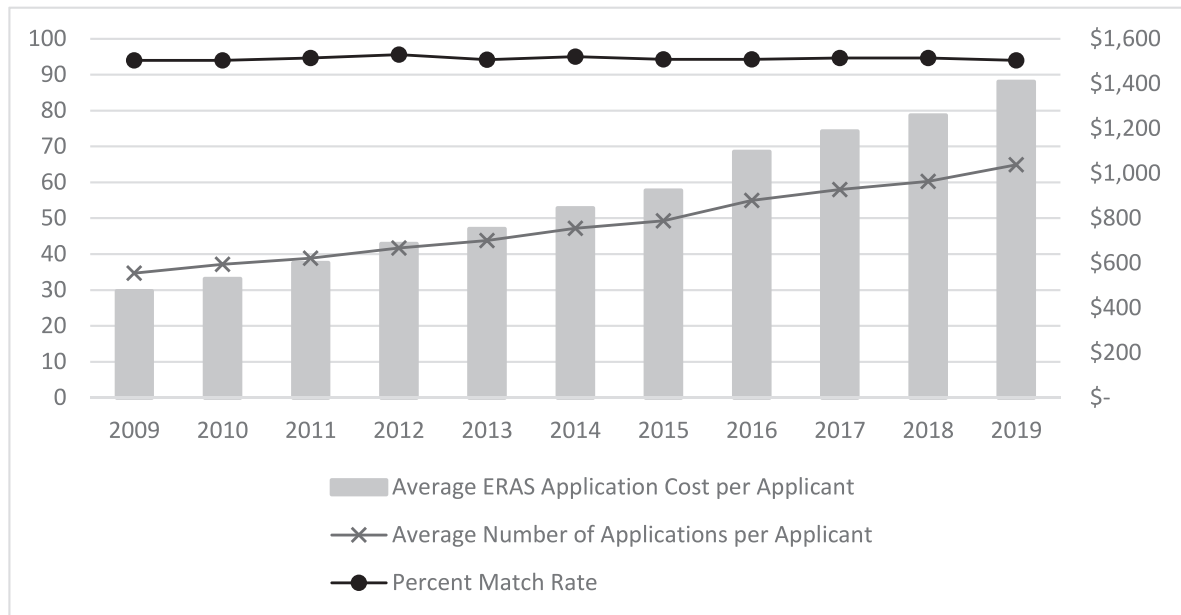


FIGURE 1
Trends in ERAS Application Rates/Costs and NRMP Match Rates for US MD Seniors (2009–2019)

Abbreviations: ERAS, Electronic Residency Application Service; NRMP, National Resident Matching Program; IMG, international medical graduate.

Note: Authors' analysis of data from ERAS Statistics reports and NRMP Results and Data reports. ERAS and NRMP data are publicly available reports, though historical ERAS reports preceding the last 5 years are only available by request from the Association of American Medical Colleges.

The Drivers

Application inflation is likely driven by several factors working in unison. Peer pressure and conformity disposition are potent drivers of human behaviors, meaning students whose peers increase their applications are likely to do the same.¹¹ A survey of internal medicine residents suggested these factors increase ERAS applications.¹² A similar effect evolved for Advanced Placement (AP) examinations in high school where indirect peer pressure and conforming behavior have escalated AP class enrollments with some concerning effects.¹³

Beyond peer pressure, behavioral economic drivers, particularly fear of not matching, lead most students to “over-apply, overaccept.”¹⁴ These are frequently stoked by claims that medical school expansion will limit residency options for students, a fear echoed by deans.¹⁵ This is despite AAMC data showing stagnant Match rates for over a decade.¹⁶

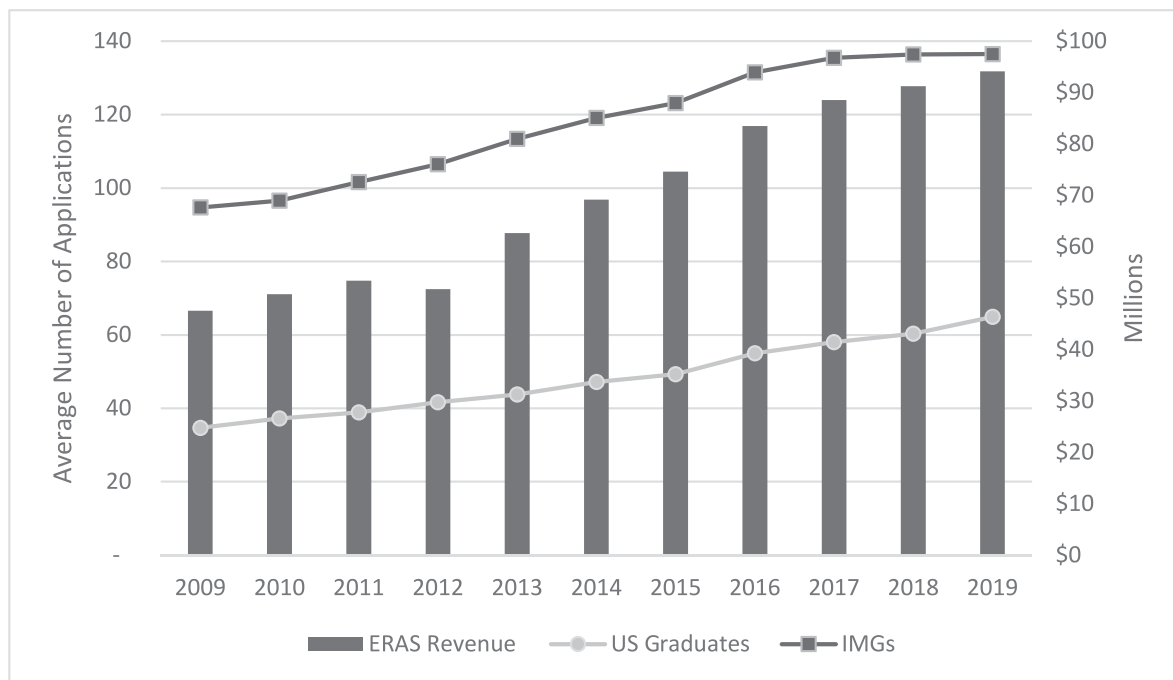
Economic factors may also play a role. While application and interview costs continue to grow, even a generous \$10,000 application budget pales in comparison to the rising debt medical students now face—more than \$200,000 on average.¹⁷ Faced with the fear of not matching, students may simply consider this a “drop in the bucket” compared to the overall cost of a medical degree.

Finally, a review of application rates to medical schools, graduate schools, and law schools did not reveal the application inflation seen with ERAS, suggesting application inflation is not an environmental phenomenon.^{18–20}

Potential Solutions

This season's virtual shift is one of necessity. While the health benefits of this temporary change are welcome, the potential surge in applications is not. A recent publication called for a timely response by graduate medical education stakeholders to “both mitigate the immediate effects of COVID-19 on the residency selection process and improve this system more broadly.”⁹ Heeding this call, obstetrics and gynecology leadership organizations proposed specialty-wide changes.²¹ In particular, programs were urged to release interview offers in a standardized window and to limit offers based on available slots.²² In otolaryngology, applicants can now send tokens to 5 programs to signal their interest to interview and overcome the “noise” of application saturation.²³ Previous proposals like mission-driven recruitment were not implemented this season but may prove beneficial for future seasons.²⁴

More broadly, the AAMC has the capacity to curb the burden on students and programs by making decades of ERAS data available, empowering students

**FIGURE 2**

Trends in Average Number of ERAS Applications and ERAS Revenue (2009–2019)

Abbreviations: ERAS, Electronic Residency Application Service; IMG, international medical graduate.

Note: Authors' analysis of data from ERAS Statistics reports and IRS Form 990 for the Association of American Medical Colleges.

to make better-informed decisions on which programs to apply. Currently, AAMC data are available to applicants via the Apply Smart and Residency Explorer tools.^{25,26} Apply Smart attempts to show the point of diminishing returns where more applications do not translate to a greater likelihood of matching, but its flawed assumptions need repair.²⁷ Similarly, Residency Explorer compares an applicant's metrics with those of matched residents at programs of interest, but stops short of providing actionable data for applicants to reasonably estimate their likelihood of an interview offer or a match. Addressing the flaws of these tools would be a meaningful step to guide application choices based on probable fit rather than peer anecdotes and fear of not matching.

There have also been calls for limiting residency applications for several years without serious consideration by stakeholders.^{3,12,28} With ERAS now representing more than 40% of the AAMC's total revenue, any systemic change like limiting applications will have economic implications: In 2019, if applications had been capped at 20 per student, ERAS revenue would have decreased from \$94 million to \$11 million. The potent conflict between AAMC's economic interests and students' best interests should be addressed and may require a neutral third party to administer ERAS.

Conclusions

A virtual 2020–2021 Match season was an important decision for student health. However, a real risk of that decision may be escalation of the prior decade's growth in non-beneficial ERAS applications, enhancing an existing ethical dilemma. There are strong ethical reasons to provide students with information to reduce fears of not matching, and of limiting the number of ERAS applications. An examination of current policies and their effects on underrepresented applicants is also needed. At the time of writing, the effect of COVID-19 on student application rates leading up to the 2021 Match remained unknown. However, the likelihood of another dynamic season ahead presents perfect timing to test previously recommended strategies and policies.

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