

Applicant Signaling in the Resident Application Process: Game Theory Implications

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INTRODUCTION

With the recent removal of a quantitative score for the first step of the United States Medical Licensing Exam (USMLE) and increased medical student interest in Diagnostic Radiology (DR) throughout of recent application cycles, DR program directors have experienced marked increases in the number of applications. Concurrently, The COVID-19 pandemic resulted in a shift toward virtual interviewing at many programs which has boosted the number of interviews applicants are willing to accept. In order to help program directors ascertain applicant interest level, applicants now have a finite number of signals they can apply to programs.[1]

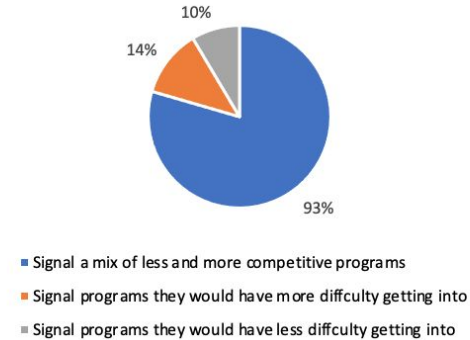
METHODS

Differences between specialties concerning signal allowances are described, as are the survey findings of the American Association of Medical Colleges. Game theory is in place for any economic situation in which one player's benefit depends on other players' strategies. The use of the new signal system is described in the context of economic game theory, as is the use of interest letters issued by programs.

RESULTS

Otolaryngology was the first specialty to implement signals in 2020-2021. Orthopedic surgery allows the most signals with 30. Diagnostic radiology allows 6 gold and 6 silver signals. The AAMC found that 88% of programs using signals used them as a screening tool before a more thorough application review and 86% of programs surveyed stated that they used signals to break ties on decisions of whom to interview. The NRMP relies upon the Roth-Peranson algorithm in which students propose to residencies in a sequential manner based on their ranked preference list. The algorithm has been said to be "strategy proof", meaning it is advantageous for students to truthfully present their preferences without benefit from lying. When students propose, misstating their preferences can be detrimental. On the other hand, hospitals theoretically could manipulate their preferences, however, no such manipulation has been noted or confirmed in the NRMP and would be very difficult to perform successfully. However, interest letters from programs to specific applicants serve to influence applicants' rankings, potentially encouraging applicants to deviate from the dominant true preference based strategy.

2022-2023 AAMC Data on the Strategies Advised for Selecting Programs to Signal



DISCUSSION

Signals introduce a new element to the interview phase of the process. A dominant strategy may be for applicants to signal their most desired programs; however, applicants may choose to reserve their signals for programs that they are less likely to get an interview at, further complicating the game and confusing programs. While it's in the students best interest to rank according to their true preference in the match, students can apply game theory to signaling. Signaling a hospital in which the student would have more difficulty getting into they may increase their chances of getting an interview. With a limited number of signals, applicants may benefit from signaling their true preferences along with "reach programs" taking into account the importance placed on a signal at said institution.

CONCLUSIONS

While the new signal system is intended to help program directors decide whom to interview in a system affected by increases in applications, the signals introduce new strategies that prospective radiology residents may use to game the system to increase interviews and attempt to influence programs to prefer them. Signals, in theory, should not impact programs' rank lists, but they may have the same psychological effect on inexperienced program directors that programs' interest letters have on applicants. Program directors unaware of applicant gaming with signals may not receive their most optimal matches. Fortunately for students, The NRMP is prioritizing students interest over those of hospitals by shifting the proposing responsibility to students, a departure from historical practices in which hospitals typically held the proposing role.

REFERENCES

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Specialties Participating in Program Signaling in 2024 ERAS Application Season

