



## EDITORIAL AND COMMENT

# Preference Signals in Residency Applications: a Potential Tool to Combat Application Inflation

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Educators across the continuum of medical education recognize an ongoing crisis in the transition from medical school to residency. The process is very high stakes for applicants; in the past 5 years, fear of going unmatched has fueled a large increase in the average number of programs to which applicants apply (called “application inflation”), despite match rates remaining fairly constant, and quite high, over the same time period.<sup>1,2</sup> The process is also high stakes for programs, and residency programs may spend disproportionate amounts of time reviewing applications, performing interviews, and recruiting potential residents at the expense of teaching and mentoring current residents.

In an attempt to help applicants express their unique qualities and preferences, and to help residency programs identify applicants best suited for, or most interested in, their programs, the American Association of Medical Colleges Electronic Residency Application Service (AAMC ERAS) introduced its Supplemental Application (ERAS-SA) in 2021. In addition to brief questions about personal experiences, ERAS-SA allows applicants to send optional “preference signals.” Applicants may send geographic preference signals by selecting up to 3 preferred geographical regions (out of 9), and/or program preference signals by selecting individual programs of interest. The number of program signals differs for each specialty, from two for Internal Medicine/Psychiatry to 30 for Orthopedic Surgery in 2023.<sup>3</sup> Applicants in Internal Medicine (IM) could send up to five program signals in 2021–2022, and seven in 2022–2023.

Uptake of preference signaling has been high; in 2023, the average number of program signals sent by IM applicants was 6.89.<sup>3</sup> There were no statistically significant differences in the average number of signals sent by White and non-White applicants or by male and female applicants.<sup>3</sup> ERAS proposed preference signaling as additional information for programs and cautioned against using signals as strict inclusion or exclusion criteria for interview invitation decisions. Nonetheless, in a survey of program directors (PDs) across all fields, 88% of respondents used program signals as a screening tool before more thorough application review, with 70% of those calling it important or very important.<sup>4</sup>

Data-driven insight into the use of preference signaling is essential. IM applicants and programs are an important cohort to investigate because IM offers more positions (9725) to more applicants (14,231) than any other specialty.<sup>5</sup> These programs and applicants are highly diverse, ranging from small community-based hospitals to large research-based universities, and more applicants who are osteopathic medical students or international medical graduates (IMGs) than other specialties. Two studies published in this issue of the *Journal of General Internal Medicine* provide important insights into preference signaling in IM.

“Internal Medicine Residency Program Directors’ Impressions of the Electronic Residency Application Service Supplemental Application” by Weinstein et al. investigated residency PD views of ERAS-SA during its first year.<sup>6</sup> Most PDs thought that ERAS-SA could improve the interview selection process, with 70% reporting this for program signaling and 53% for geographic signaling. Just over half of PDs (54%) said they would be more likely to invite applicants who signaled their programs, with a smaller percentage for geographic signals (39%). When stratified by program size, the largest programs were more likely to find program-specific preference signaling in ERAS-SA helpful and also more likely to interview applicants who signaled their program. The authors note that perhaps this is because they receive more applications; however, they may also receive more signals; in 2023, the range of signals received by IM programs ranged from 5 to 1222.<sup>3</sup> Uneven spread is a current limitation of signal utility, as those programs on either end of the range may have too many or too few to markedly impact interview or rank decisions.

As with all studies, there are limitations to this work, namely a low response rate of 36%, resulting in possible nonresponse bias. That said, the 82% of respondents who participated in ERAS-SA are consistent with ERAS survey data for PDs across all fields.<sup>4</sup> Community programs, which may receive fewer signals, were underrepresented in the sample. Further study is merited to examine the impact of the number of applications and signals received on PDs’ views of signal utility.

In the second article, “Evaluating the Impact of the Novel Geographic Preferences Section on Interview Rate and Residency Match Outcomes,” Benjamin et al. surveyed a cohort of applicants who applied to IM categorical and preliminary programs in 2022–2023 and participated in the Texas Seeking Transparency in Applications to Residency (STAR) program.<sup>7</sup> They found that both geographic and program

preference signals independently increased the likelihood of applicants receiving interview invitations and matching. The odds ratio was higher for program than geographic signals, and additive for both together (OR 3.2 to receive an interview and 6.4 to match). The authors hypothesize that the stronger impact on matching is consistent with the mathematical formula driving the match, which weights applicants' rank order lists more heavily than programs'. These data also suggest that applicants had some understanding of program suitability at the time of initial application, and furthermore that their preferences may have remained stable throughout the recruitment season. Stability of applicant preferences and their ability to identify programs at which they are likely to match are crucial for encouraging applicants to apply to fewer programs outright without decreasing their likelihood to match.

Benjamin et al.'s study is similarly limited by nonresponse bias; Texas STAR does not include osteopathic or IMG applicants, groups that make up a large percentage of IM residency applicants. The 970 respondents make up fewer than 4% of the 34,226 applicants to IM categorical and preliminary programs in 2022.<sup>1</sup> The timing of the survey, months after ERAS-SA was submitted, may also render its results subject to recall bias. Nonetheless, this study supports that preference signaling may be a useful tool to combat application inflation as PDs, applicants, and advisors become increasingly aware of the impact of signals on likelihood to receive an interview or match. Further research should be performed to determine whether the benefit of signaling is similar among different groups of applicants by including a more representative sample and performing subanalyses by race/ethnicity, gender, and type of medical school.

Both of these studies provide insight into how preference signaling could affect the residency application process and also raise interesting questions. IM PDs had high uptake of and optimism that ERAS-SA could improve resident selection, either in its current or an amended form. On the applicant side, TEXAS STAR data showed that geographic and program signals significantly increase likelihood of interviews and matching. These data support the use of signals as a potential tool to combat application inflation as all stakeholders become more aware of their impact.

Risk aversion on the part of applicants and PDs is a large driver of application inflation and excessive interviewing. Benjamin et al.'s data suggest that the current norm of application inflation results in applicants applying to many programs at which they are unlikely to match, in part due to their own preferences. On average, respondents applied to 34 programs, with nearly half of these outside of their geographic preference areas, and applied to 19 programs with neither a geographic nor a program preference signal.<sup>7</sup> Weinstein et al.'s data show that PDs were likely to use signals to shift interview invitations to applicants who signaled them, but were unlikely to reduce the number of interviews performed.<sup>6</sup> This risk aversion on both sides (as well as that of medical school deans and advisors) is one of the major barriers to rational resource use in the resident

selection process. Given this, further study should focus on finding methods to facilitate applicants' use of data to decrease applications without harming chances to match, and facilitators of risk tolerance among all stakeholders, including reducing stigma for medical schools, programs, and applicants who utilize the Supplemental Offer Acceptance Program (SOAP).

Current application numbers are unsustainable for PDs and do not result in higher match rates for applicants. Preference signaling shows promise as one method to combat application inflation, and its impact may increase over time as stakeholders on all sides better learn how to use signals. Current data suggest that rational applicants should decrease application numbers in the future in response to signaling effects, as applications beyond signal maximums may have diminishing returns. Hopefully, even if application rates do not decrease, PDs will find that signals help them to screen applications, resulting in a feasible number for close review, though uneven distribution of signals between programs results in variable impact. Should preference signaling not prove effective in achieving these outcomes in the future, more drastic measures, such as instituting application caps, should be studied and considered.

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#### Declarations

**Conflict of Interest** The authors have no conflicts of interest to disclose.

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