Exploring the Effects of Program Signaling on Interview Invitation, Ranking and Match Outcomes

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Session Objectives

- Understand the effect of program signals through the entire T2R process from:
    - Application
    - Interview invitation
    - Inclusion on a program's ROLs
    - Inclusion on the competitive section of the ROL
    - Matching
- Examine similarities/differences between signaling structures across various specialties

Signals

Program signals ***offer applicants the opportunity to express interest*** in a residency program at the time of application.

Small Number Signals (SNS)	Large Number Signals (LNS)	Two-Tiered (2TS)
Ex. Emergency Medicine	Ex. Orthopaedic Surgery	Ex. Anesthesiology

Quick Facts

- Applicants report signals reflect genuine preference.
- PDs report they help them find applicants they would have otherwise overlooked.
- Signals are not uniformly distributed across programs.
- Positively related to interview invitation in SNS, LNS, and Two-tiered.
- Positively related to placement on ROL in SNS specialties.

What is the role of signals at each stage of the transition to residency journey?

EXPLORE

APPLY

How has application volume changed?

INTERVIEW

What is the relative importance of signals to interview invitation?

MATCH

What is the relative importance of signals to being ranked and matched?

Methods

Sample

- 2025 cycle applicants to Emergency Medicine, Orthopaedic Surgery & Anesthesiology
- 2024 & 2025 cycle applicants to Internal Medicine

Predictors

- Signal, Applicant Type, **Affiliate or Sponsor Institution,** Program-State Alignment, Signal:Application Ratio, **Ever Failed S1, Ever Failed S2CK, Step 2CK,**
- Signal X Applicant Type, Signal X State Alignment, Signal x Signal: Application ratio

Outcomes

- Interview invitation
- Placement on ROL, Competitive Placement on ROL, Matched

Analyses

- Analyses conducted separately by specialty
- Descriptives (counts, boxplots)
- Multi-level modeling (applicants nested within programs)
- Program n≥30 interviews or ranks to be included

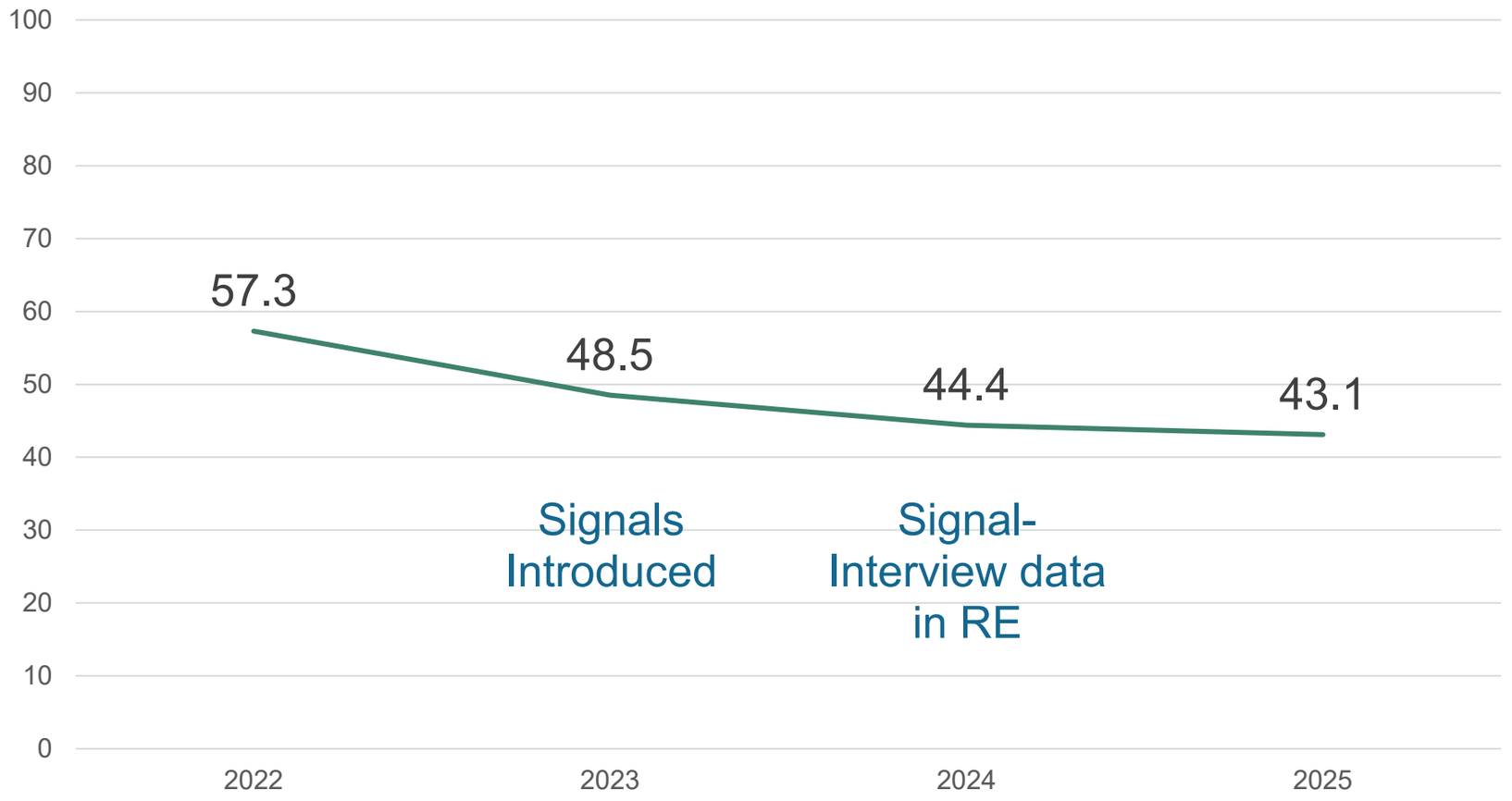
Specialty Samples

Emergency Medicine	5 Signals	Interview Invites Programs: 255 Applicants: 3,740	Ranking/Match Programs: 266 Applicants: 3,635
Orthopaedic Surgery	30 Signals	Interview Invites Programs: 118 Applicants: 1,819	Ranking/Match Programs: 151 Applicants: 1,662
Anesthesiology	5 Gold & 10 Silver Signals	Interview Invites Programs: 150 Applicants: 3,408	Ranking/Match Programs: 168 Applicants: 3,402
Internal Medicine	2024: 7 Signals 2025: 3 Gold & 12 Silver Signals	Interview Invites Programs: 530 Applicants: 24,825	Ranking/Match Programs: 566 Applicants: 23,978

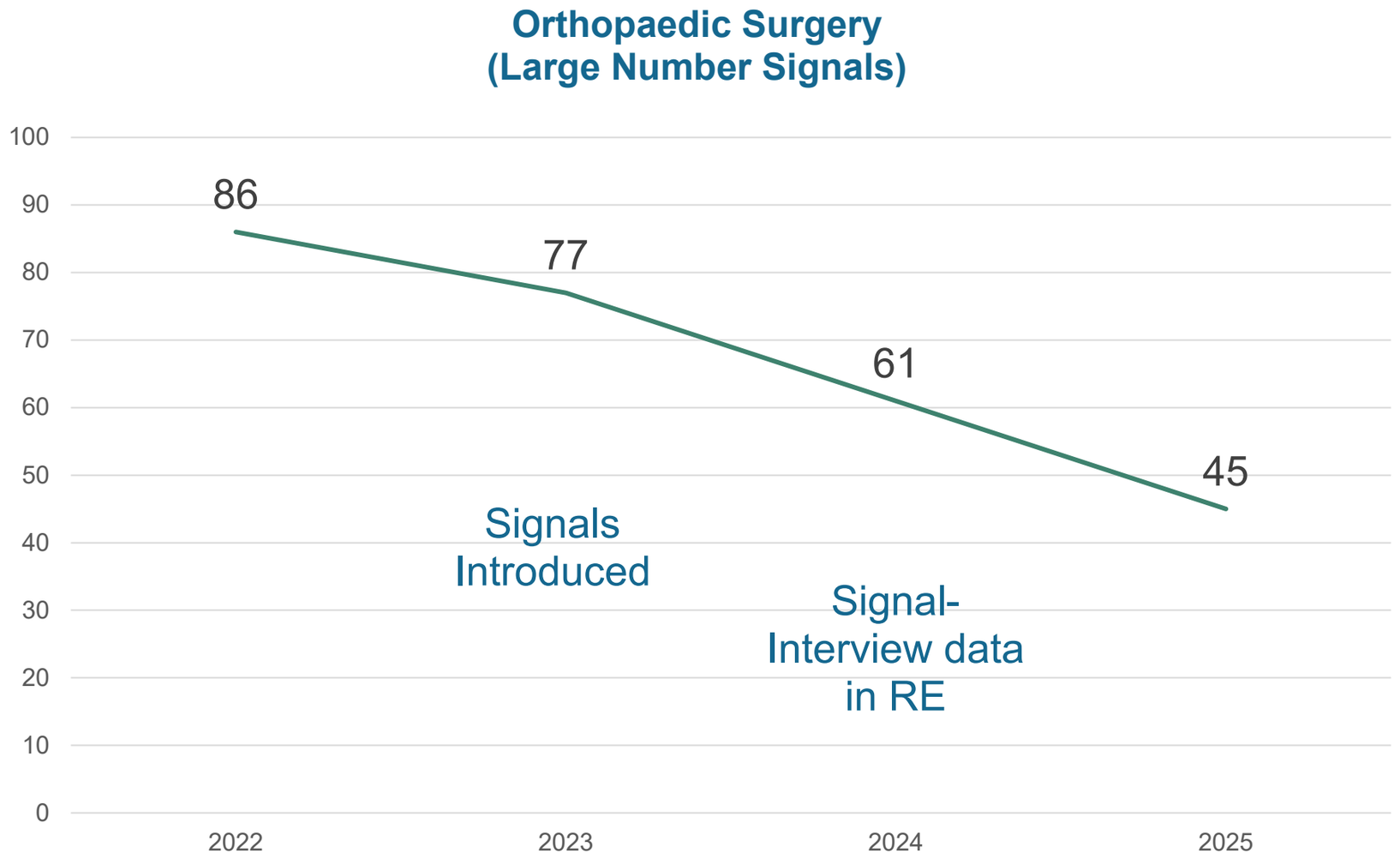
Application Volume

Emergency Medicine: (Small Number Signals)

The average number of applications per applicant in recent years



The average number of applications in recent years



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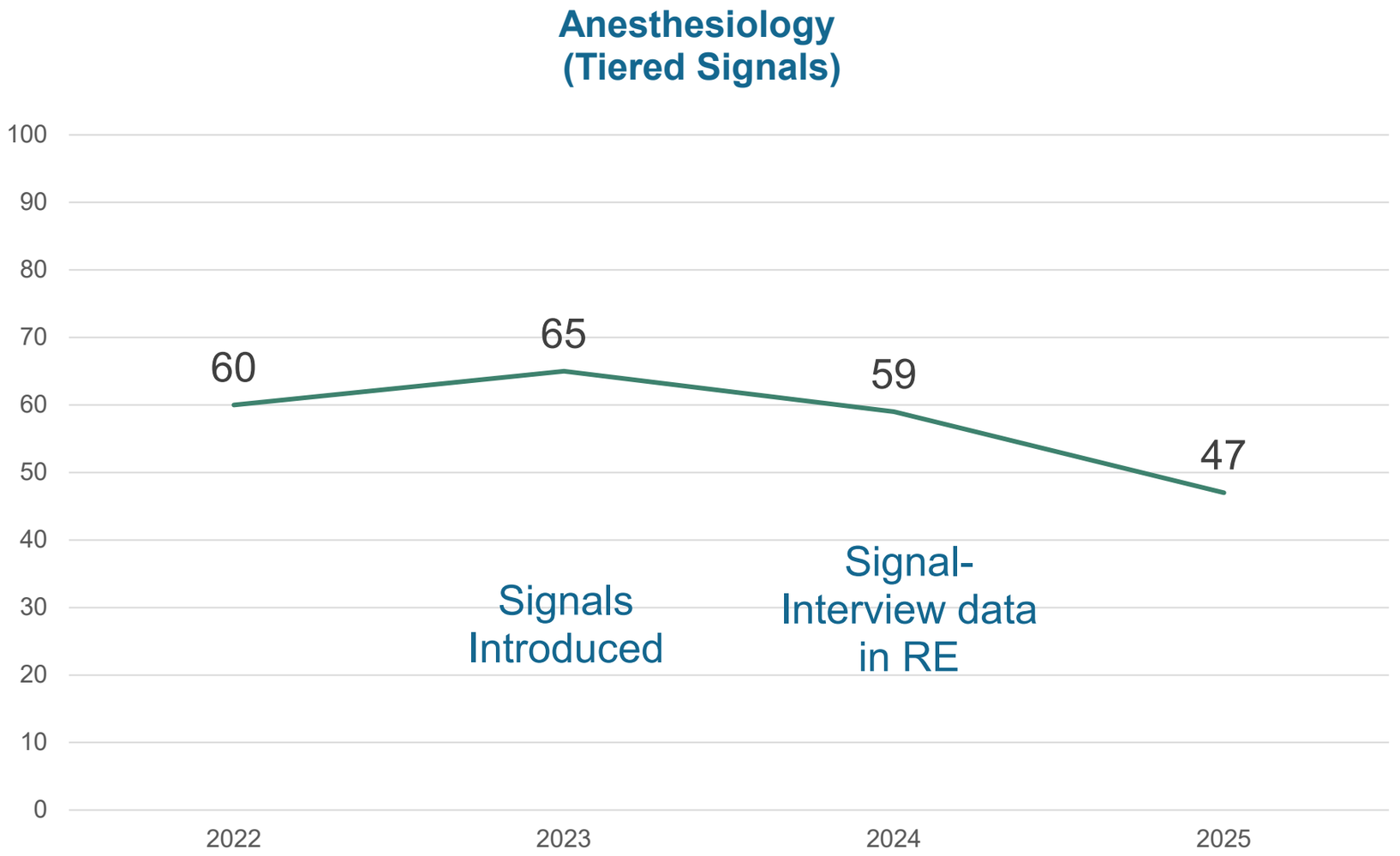

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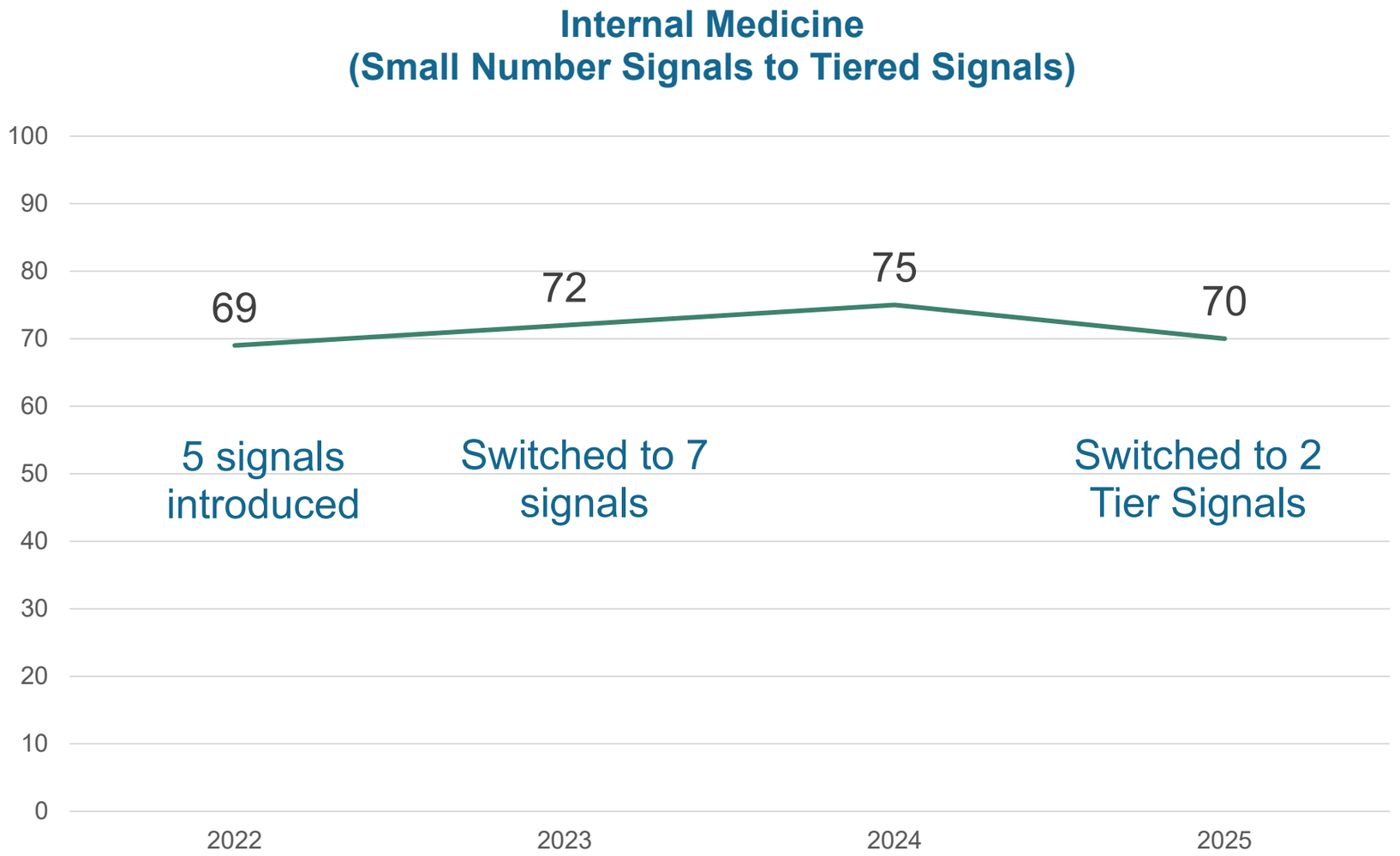
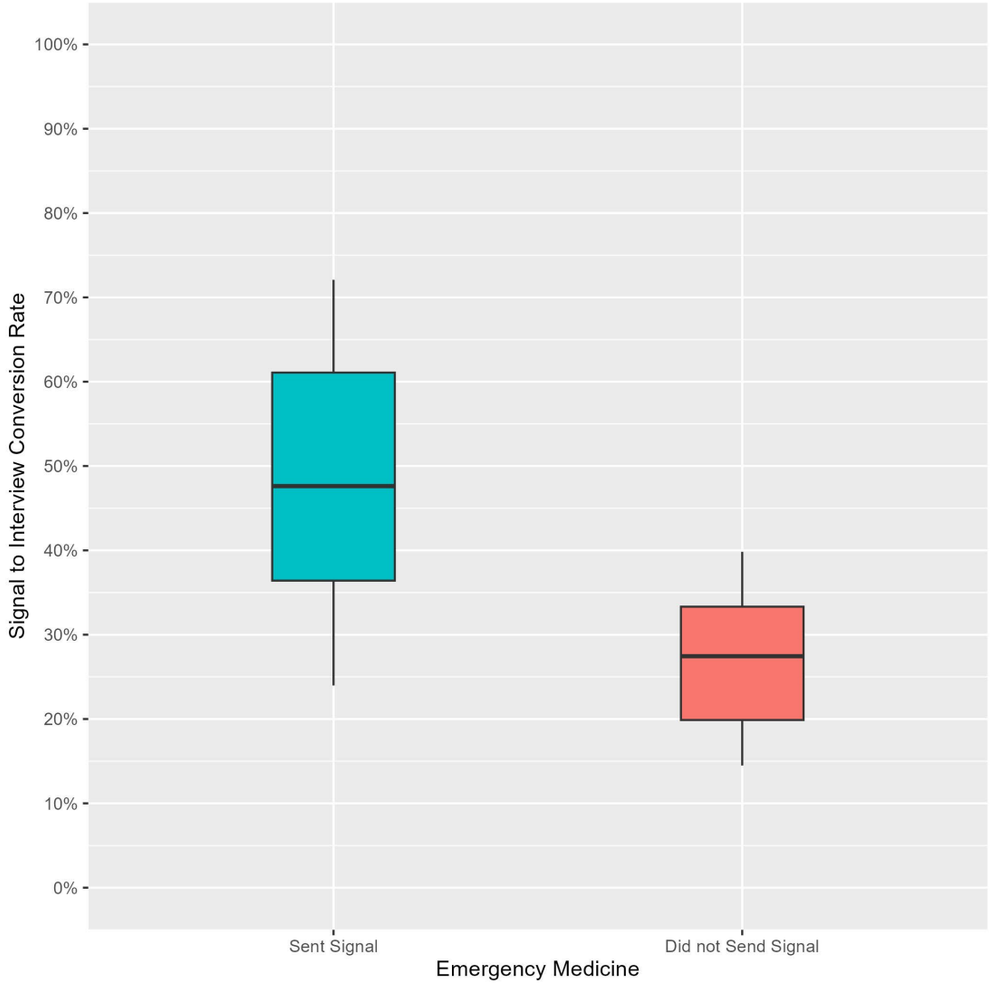
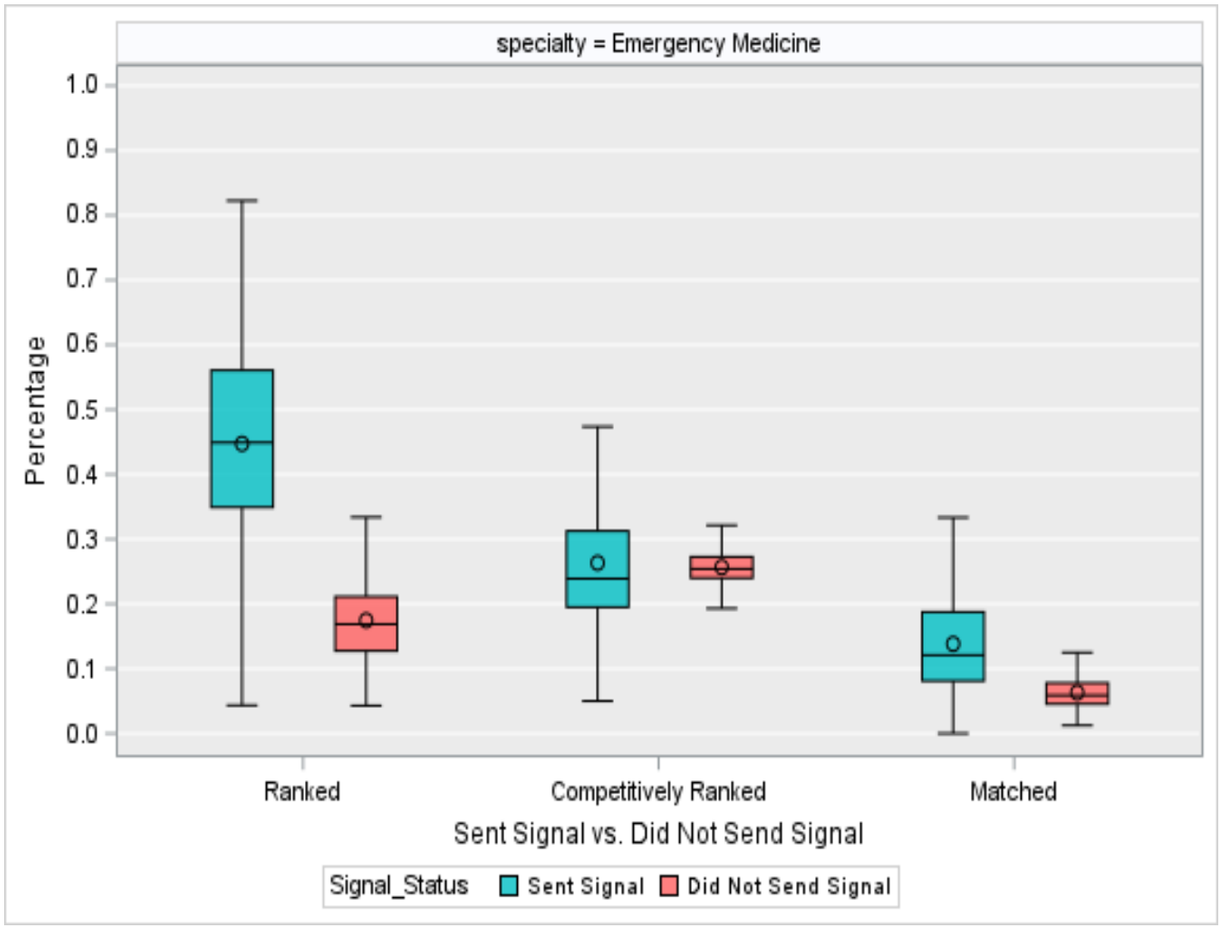


Invitation rates, placement on ROLs, and match outcomes

Emergency Medicine: (Small Number Signals)

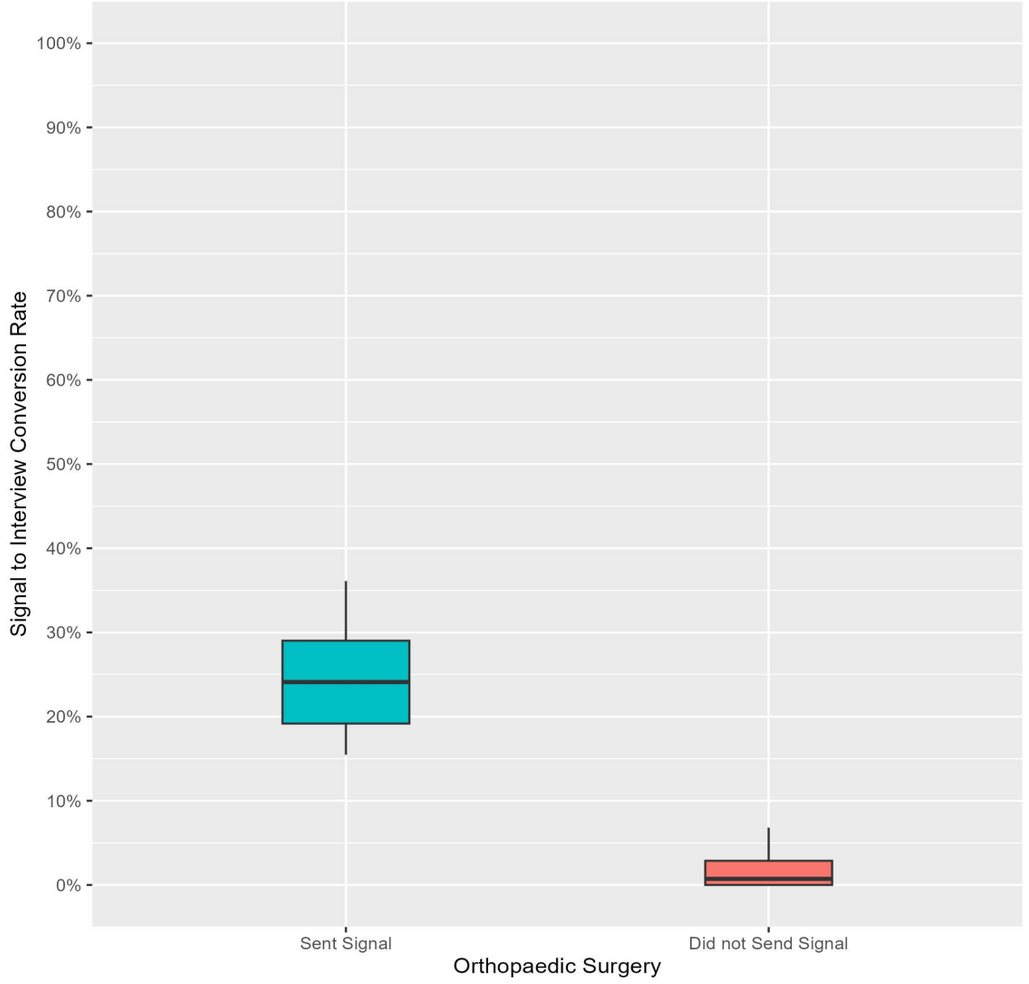
Applicants who signaled had higher invitation rates, placement on ROLs, and match outcomes

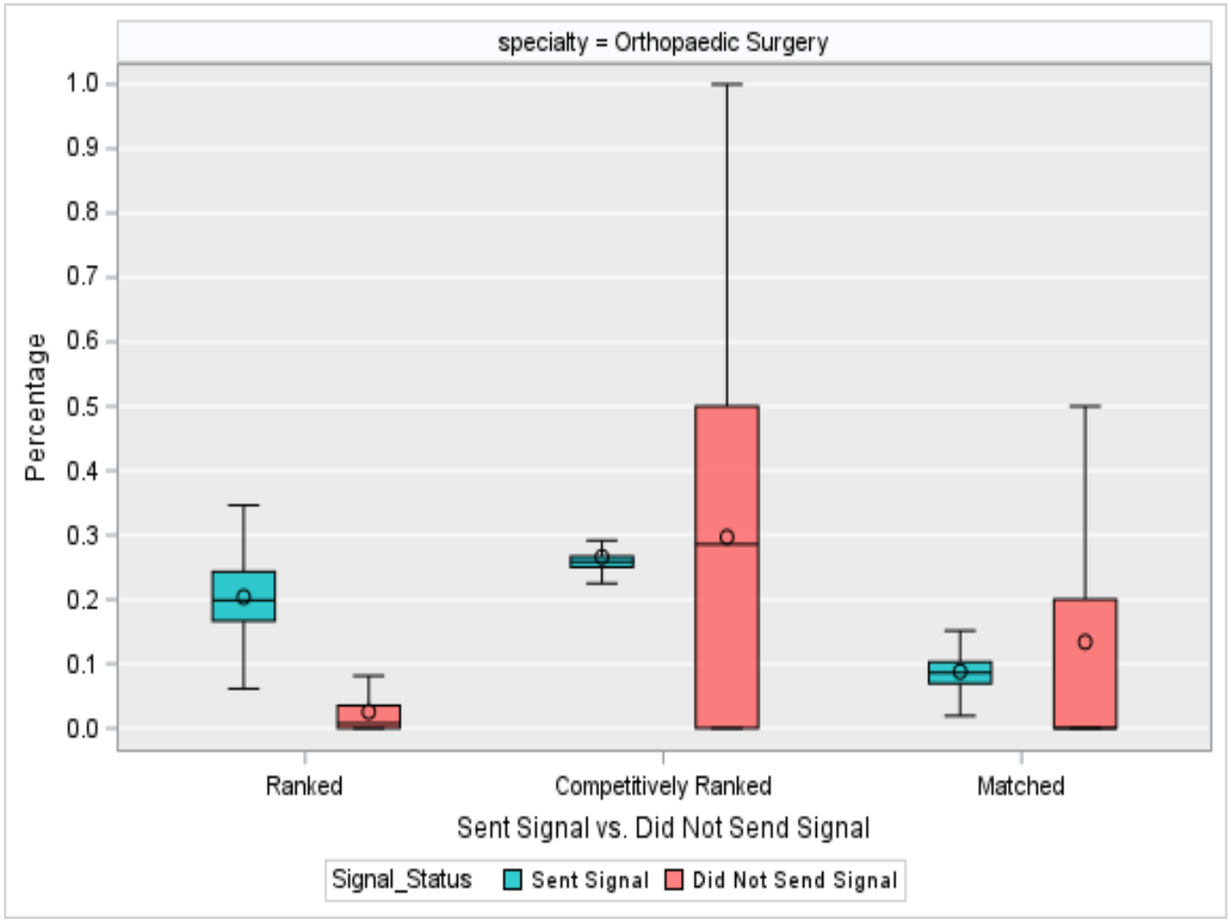




Orthopaedic Surgery: (Large Number Signals)

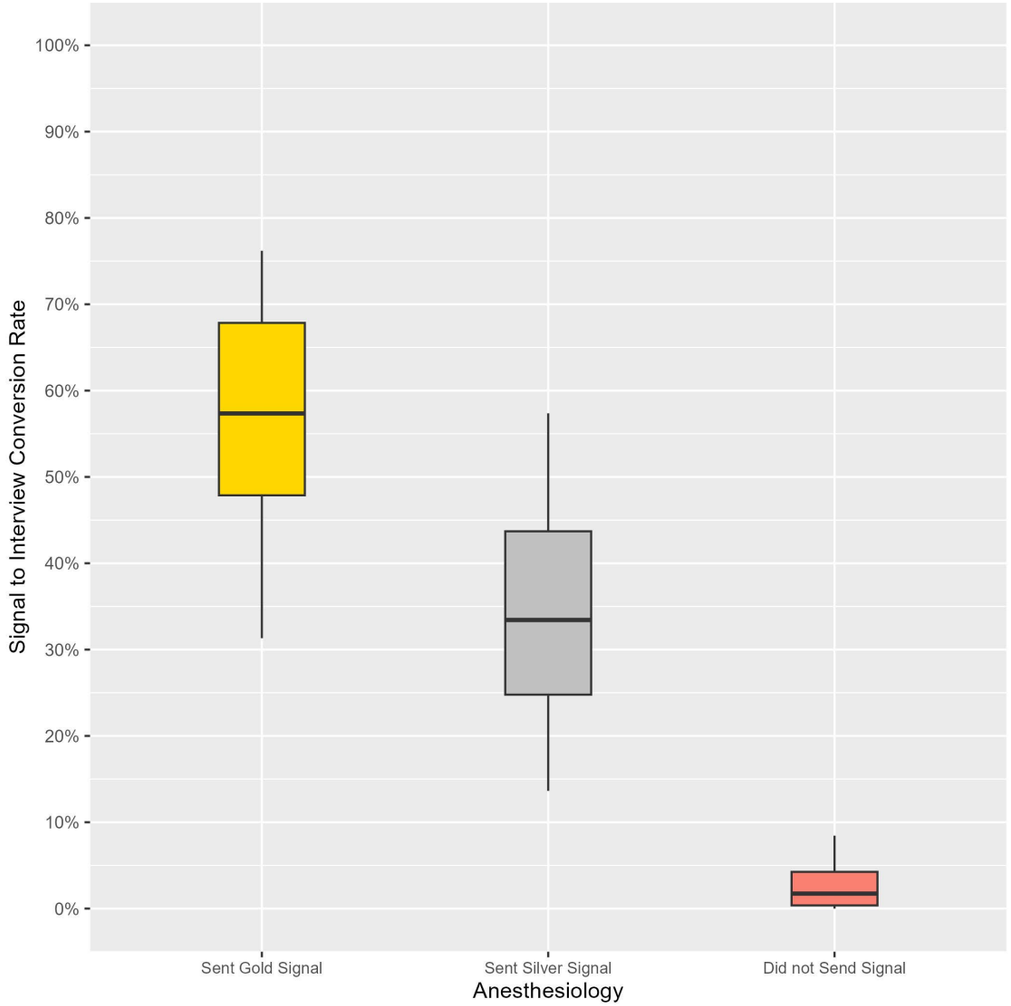
Applicants who signaled had higher invitation rates, placement on ROLs, and match outcomes

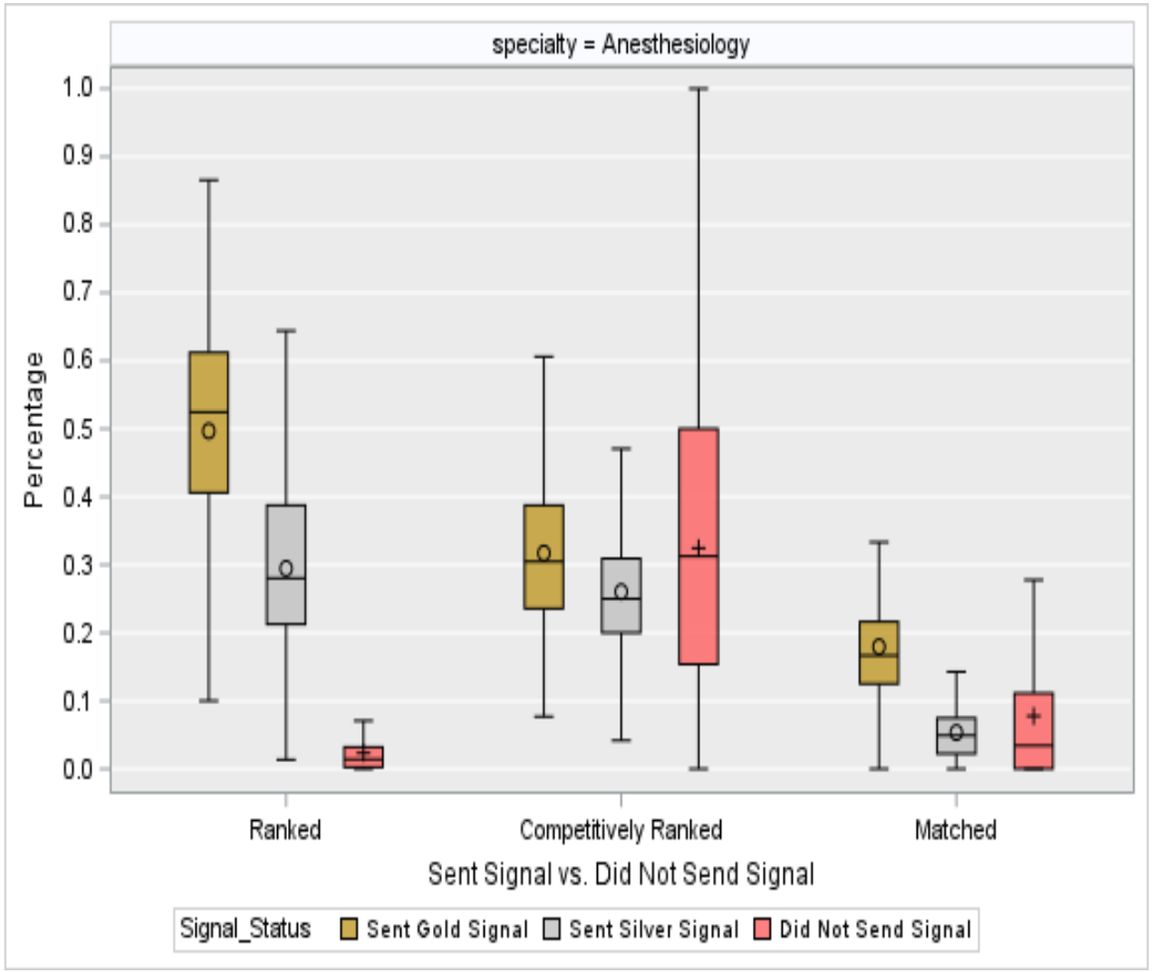




Anesthesiology: (Tiered Signals)

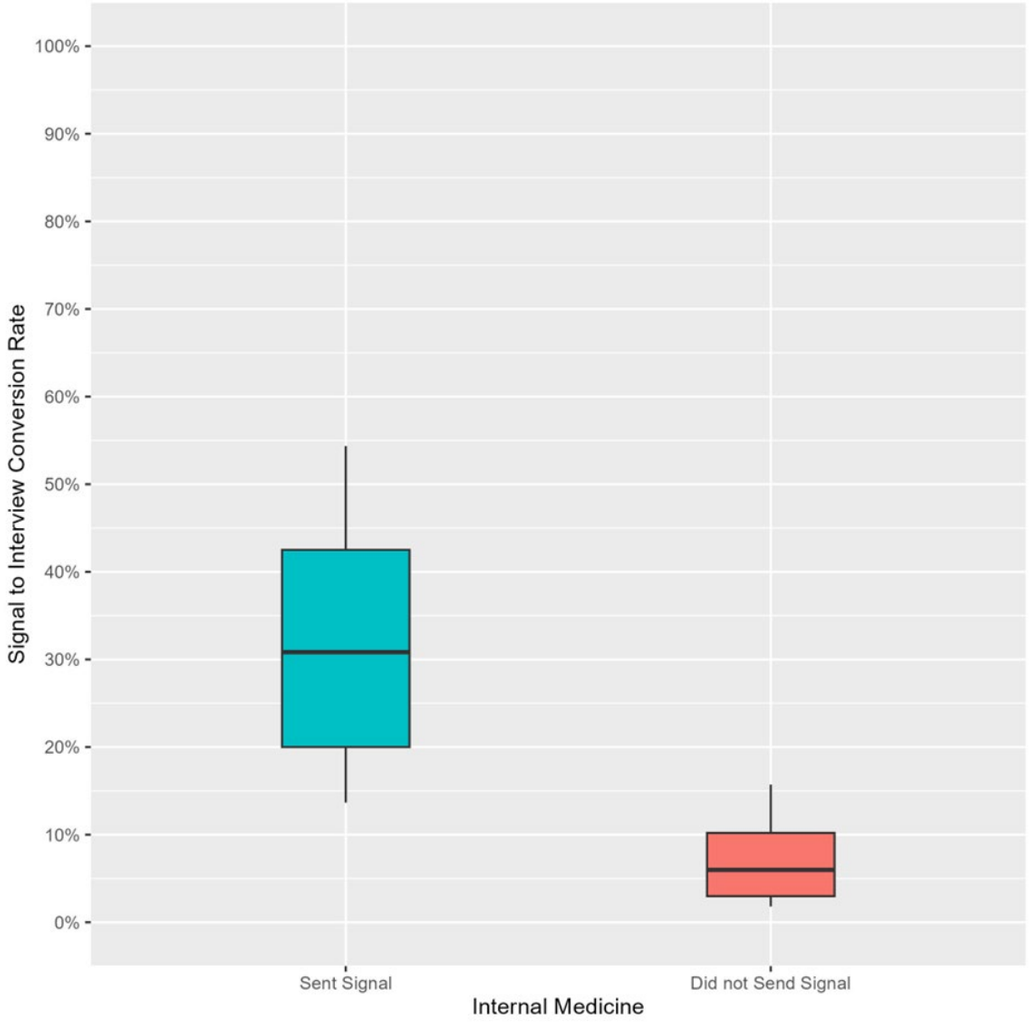
Applicants who signaled had higher invitation rates, placement on ROLs, and match outcomes

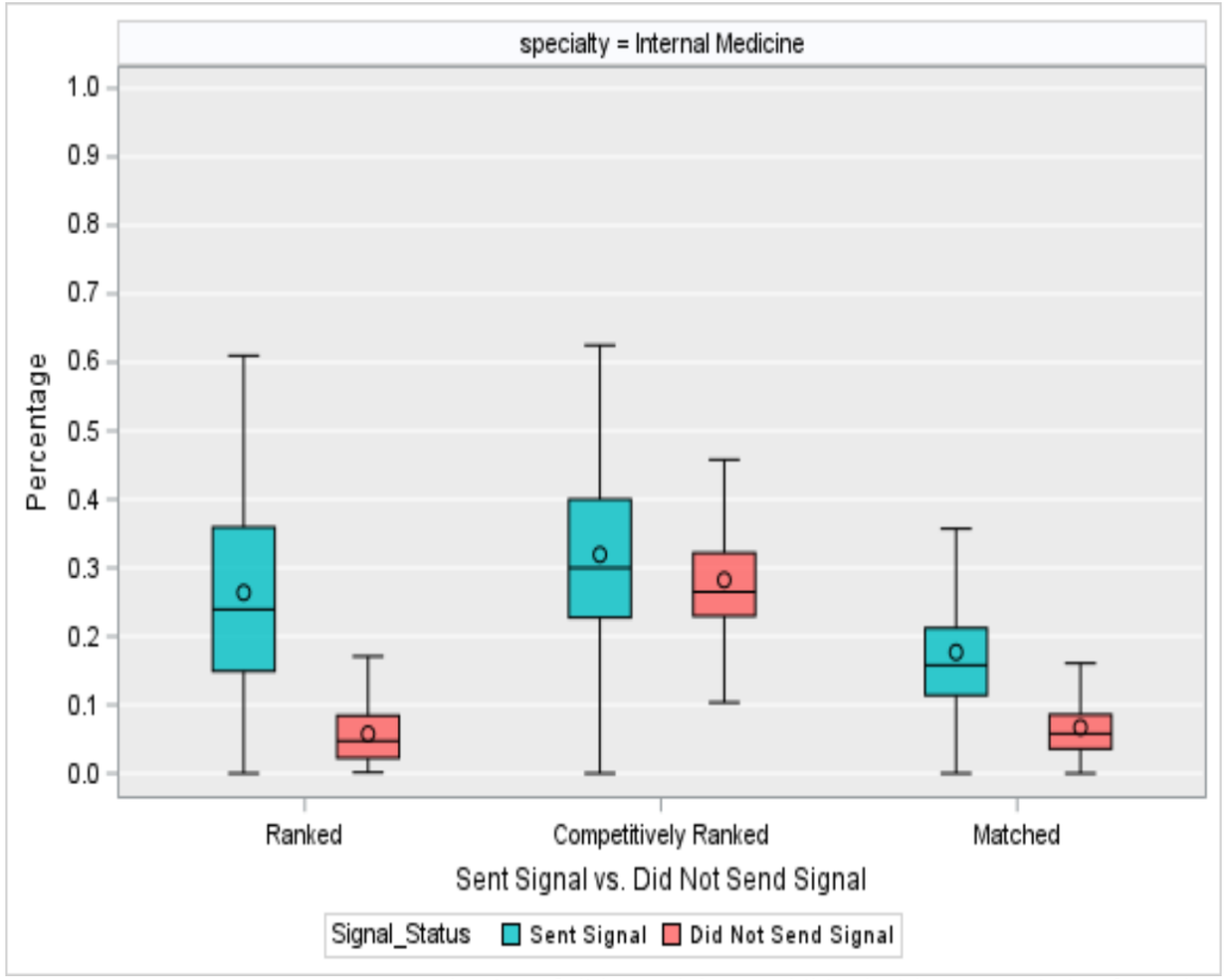




2024 Internal Medicine: (Small Number Signals)

Applicants who signaled had higher invitation rates, placement on ROLs, and match outcomes





2025 Internal Medicine: (Tiered Signals)

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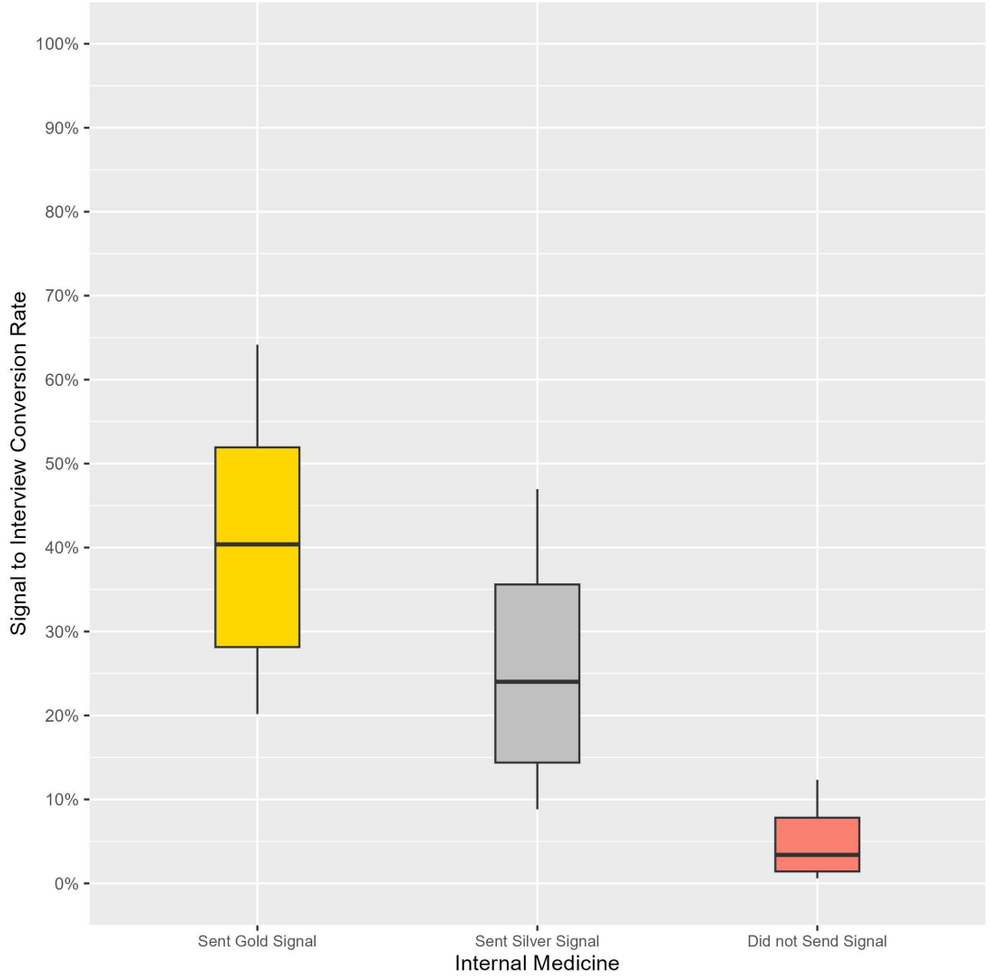
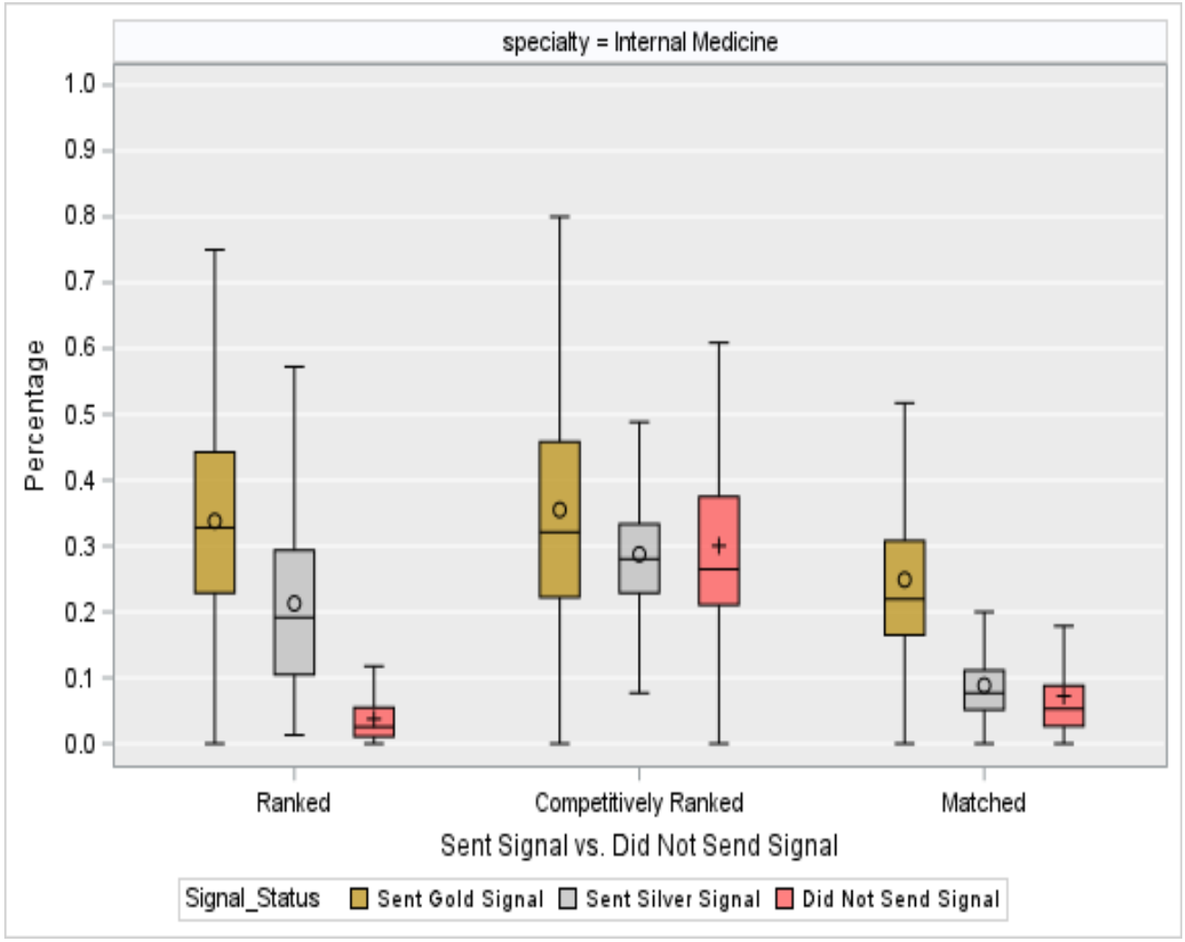


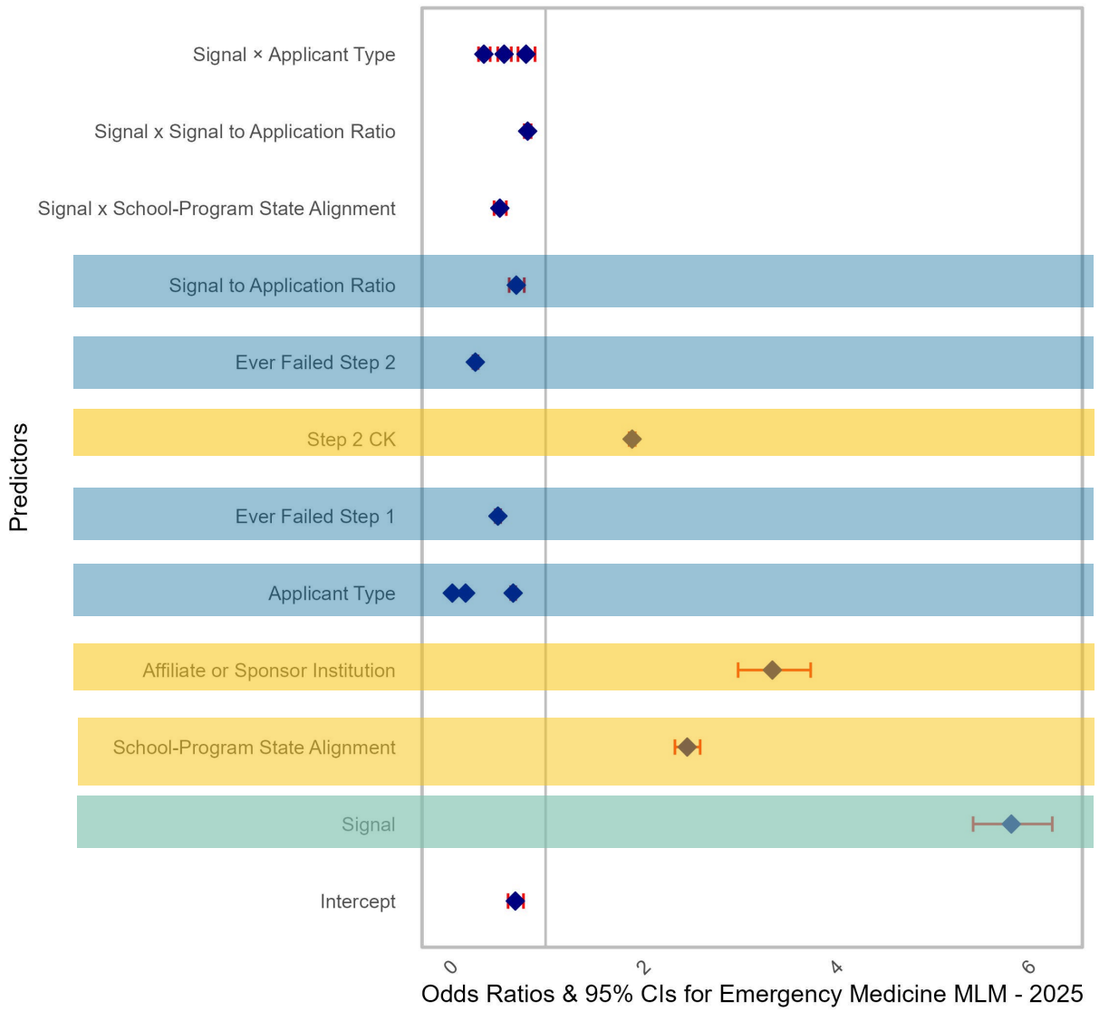


How signals affect interview invitation and being ranked relative to other application data

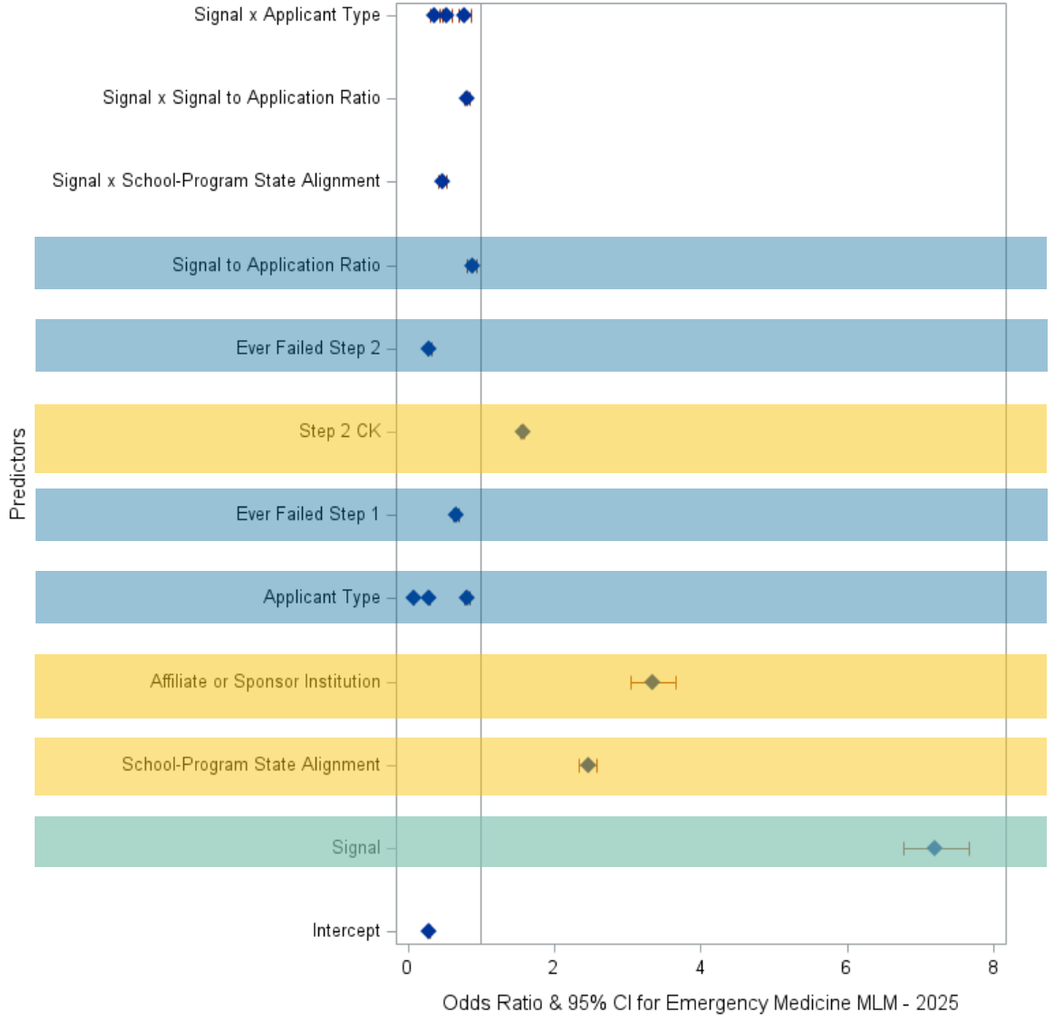
Emergency Medicine: (Small Number Signals)

Signals are the strongest predictor of interview invitation and placement on ROL

Interview Invitation



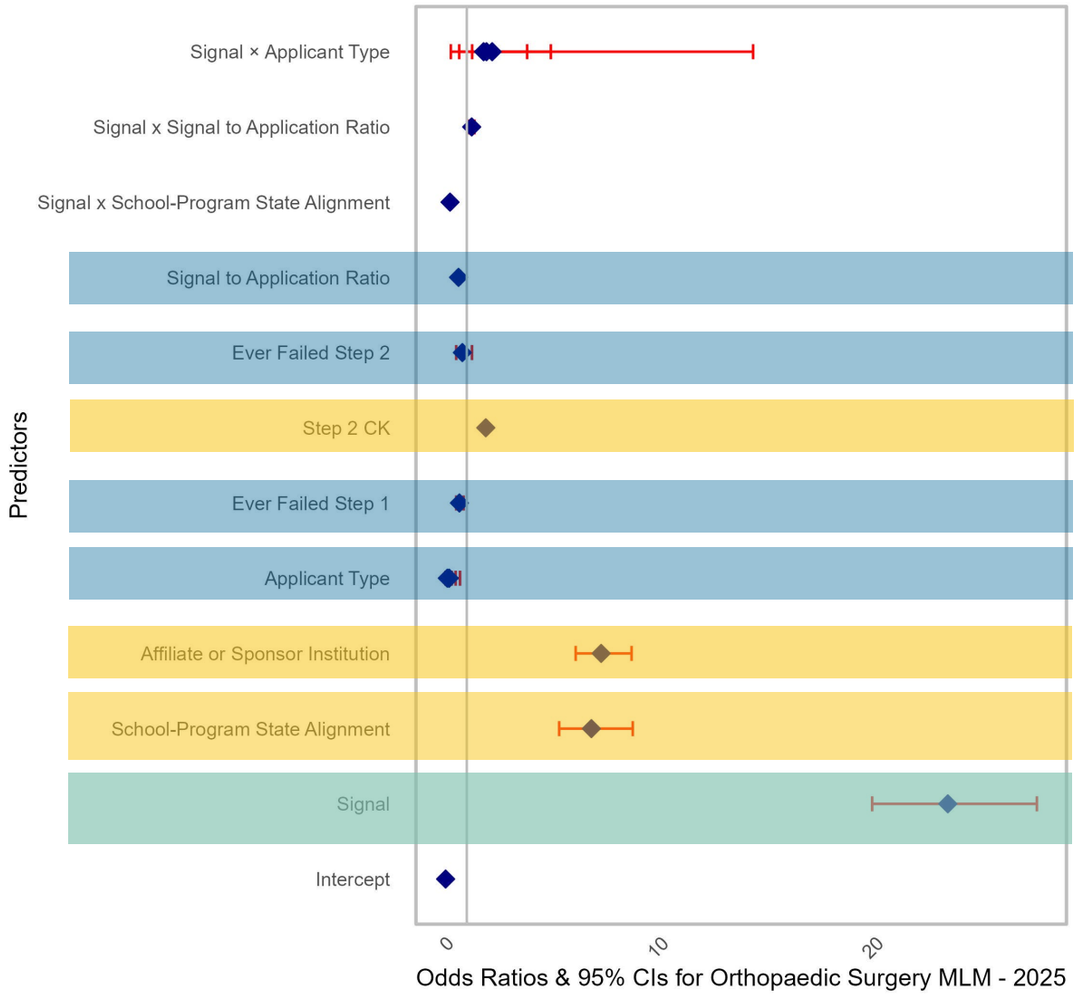
Ranked



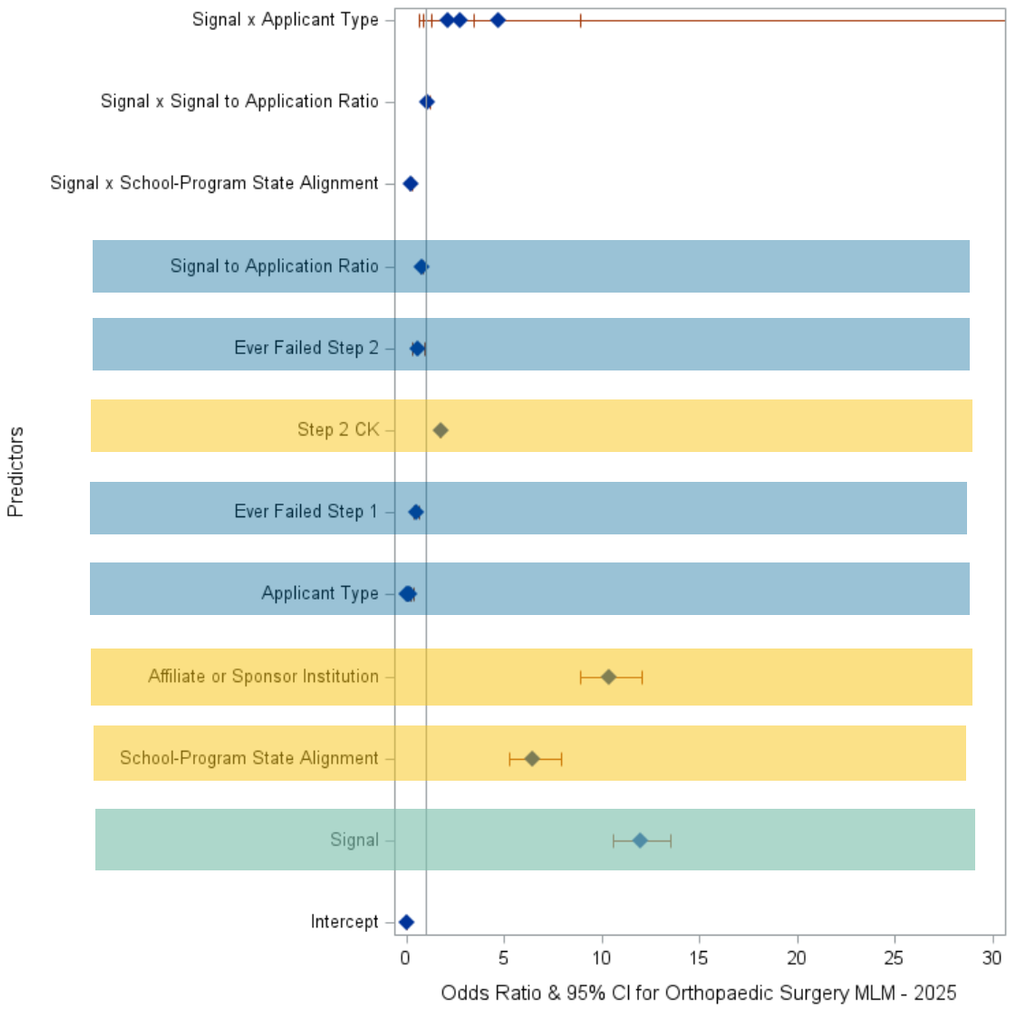
Orthopaedic Surgery: (Large Number Signals)

Signals are the strongest predictor of interview invitation and placement on ROL

Interview Invitation



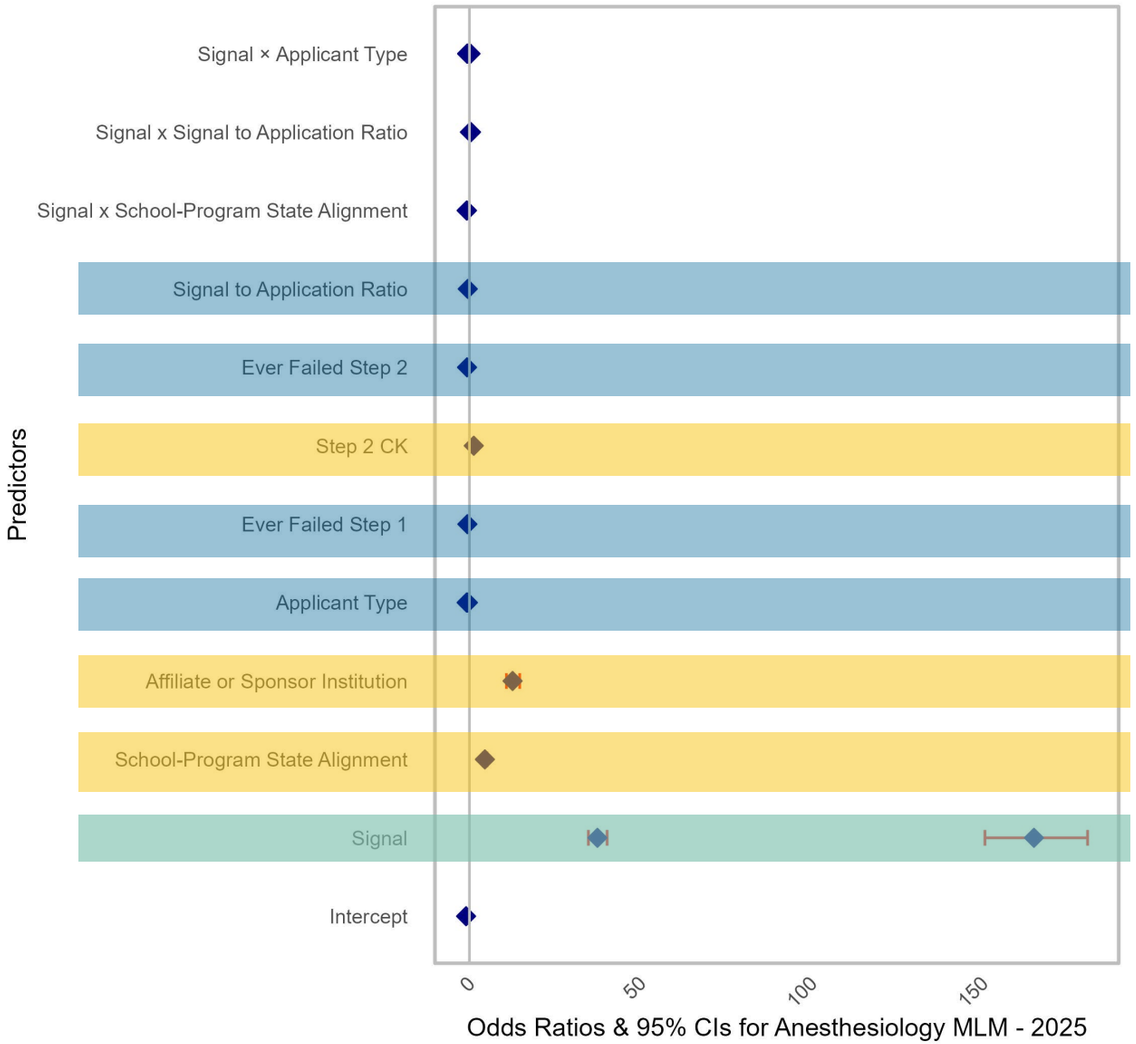
Ranked



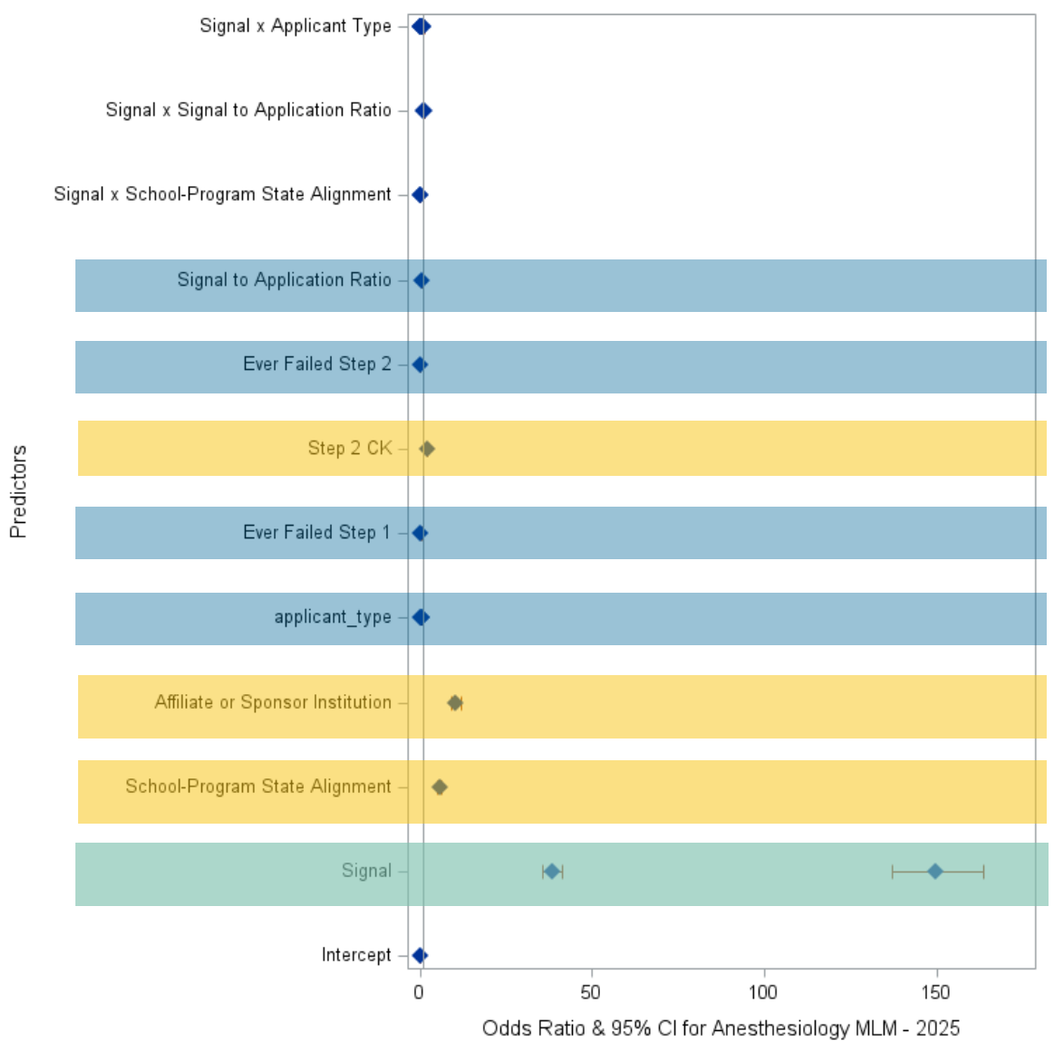
Anesthesiology: (Tiered Signals)

Signals are the strongest predictor of interview invitation and placement on ROL

Interview Invitation



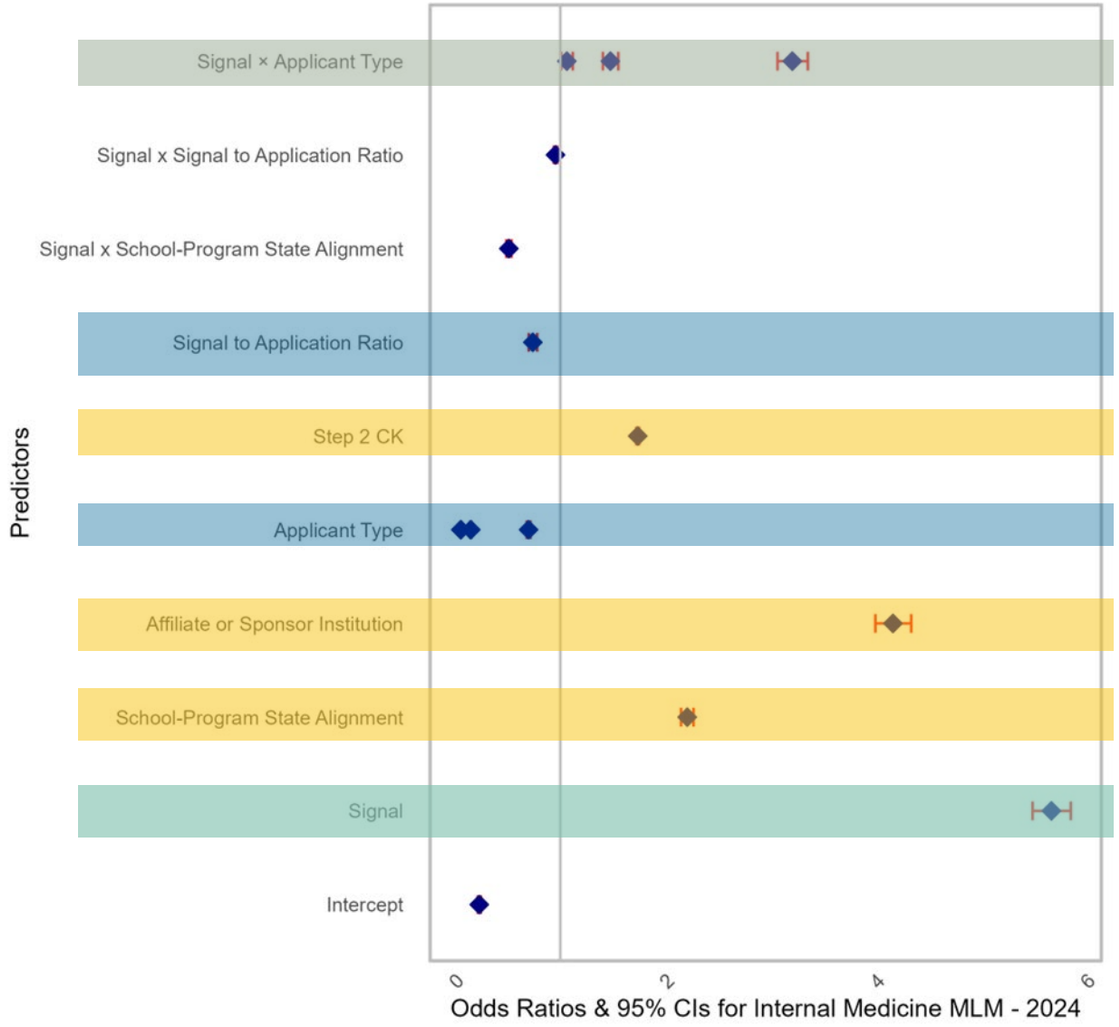
Ranked



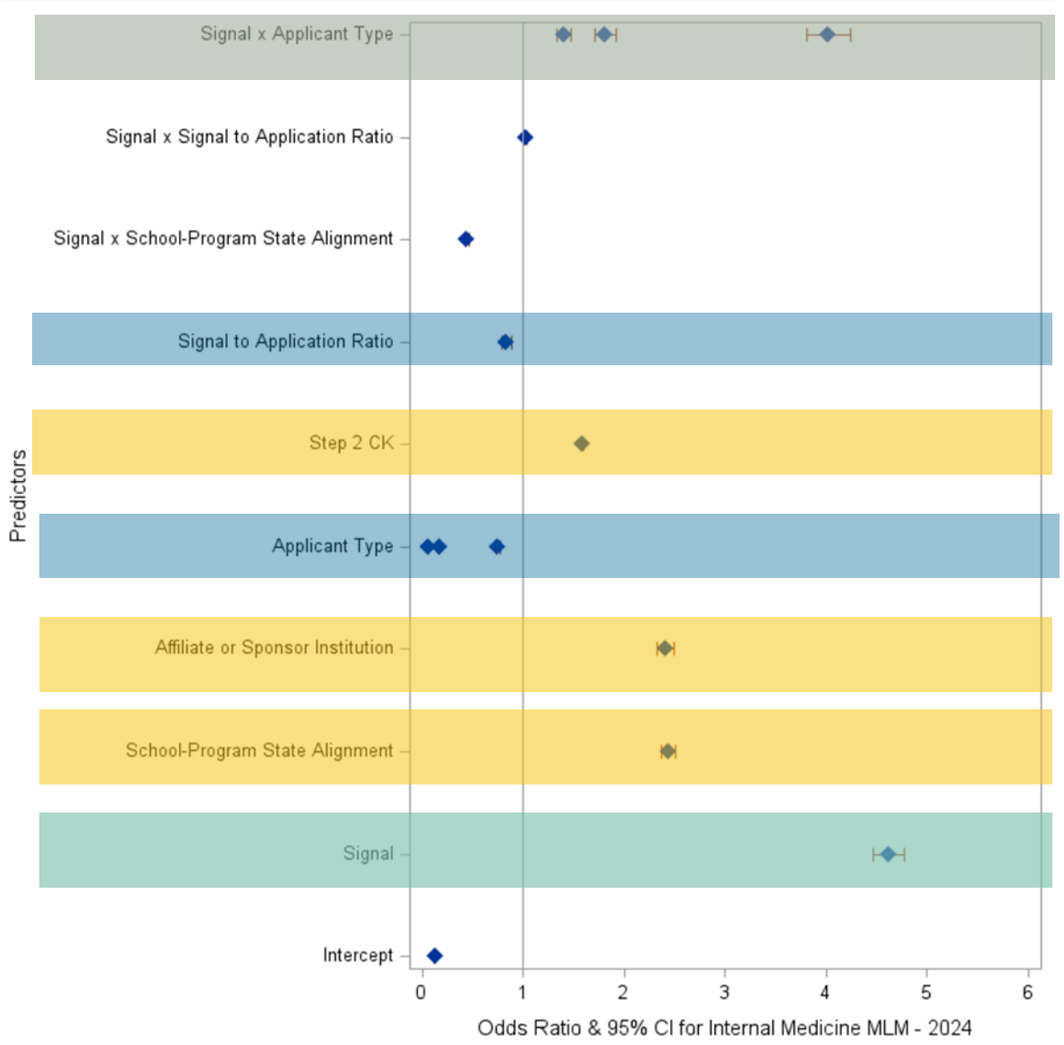
2024 Internal Medicine: (Small Number Signals)

Signals are the strongest predictor of interview invitation and placement on ROL

Interview Invitation



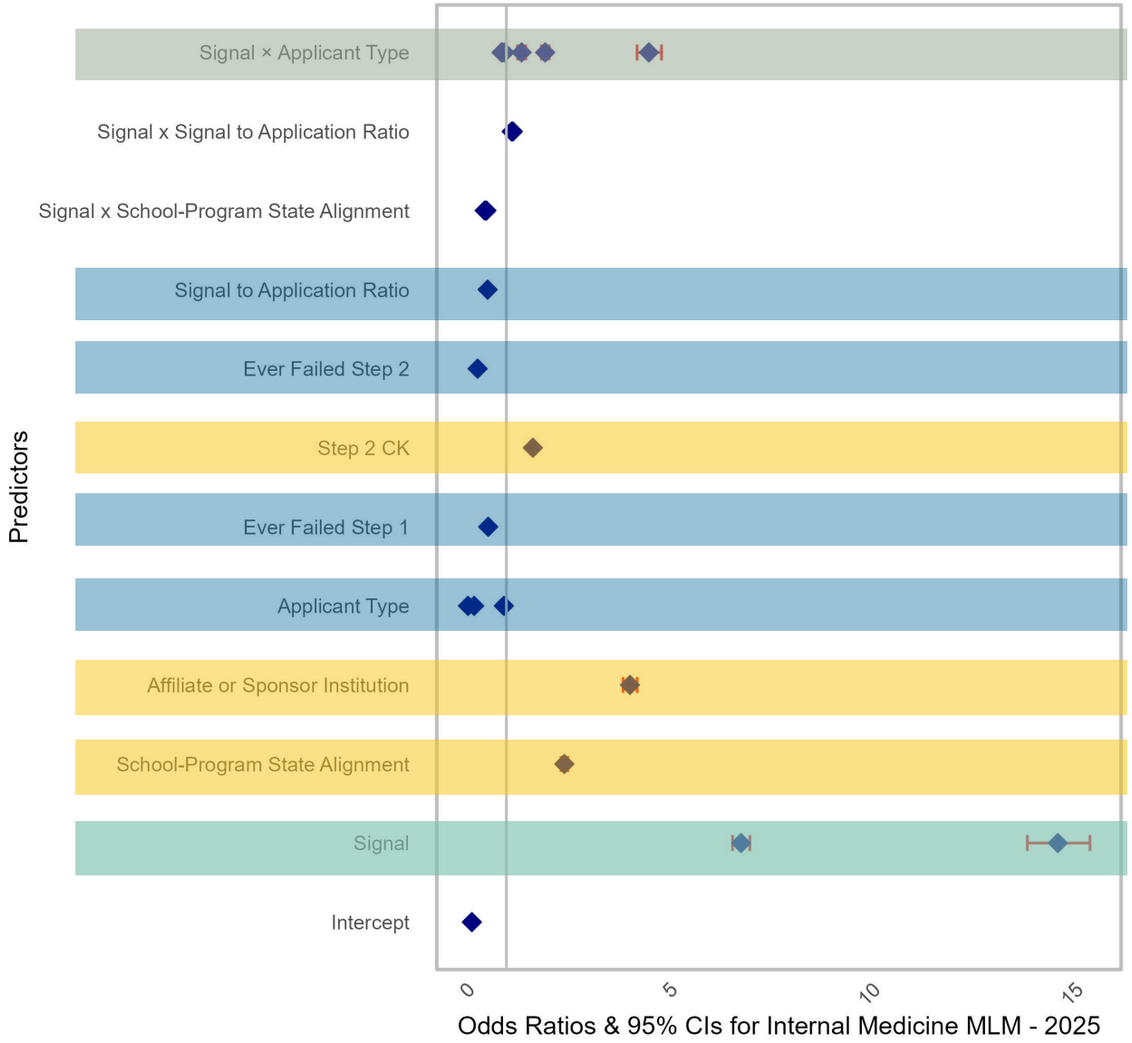
Ranked



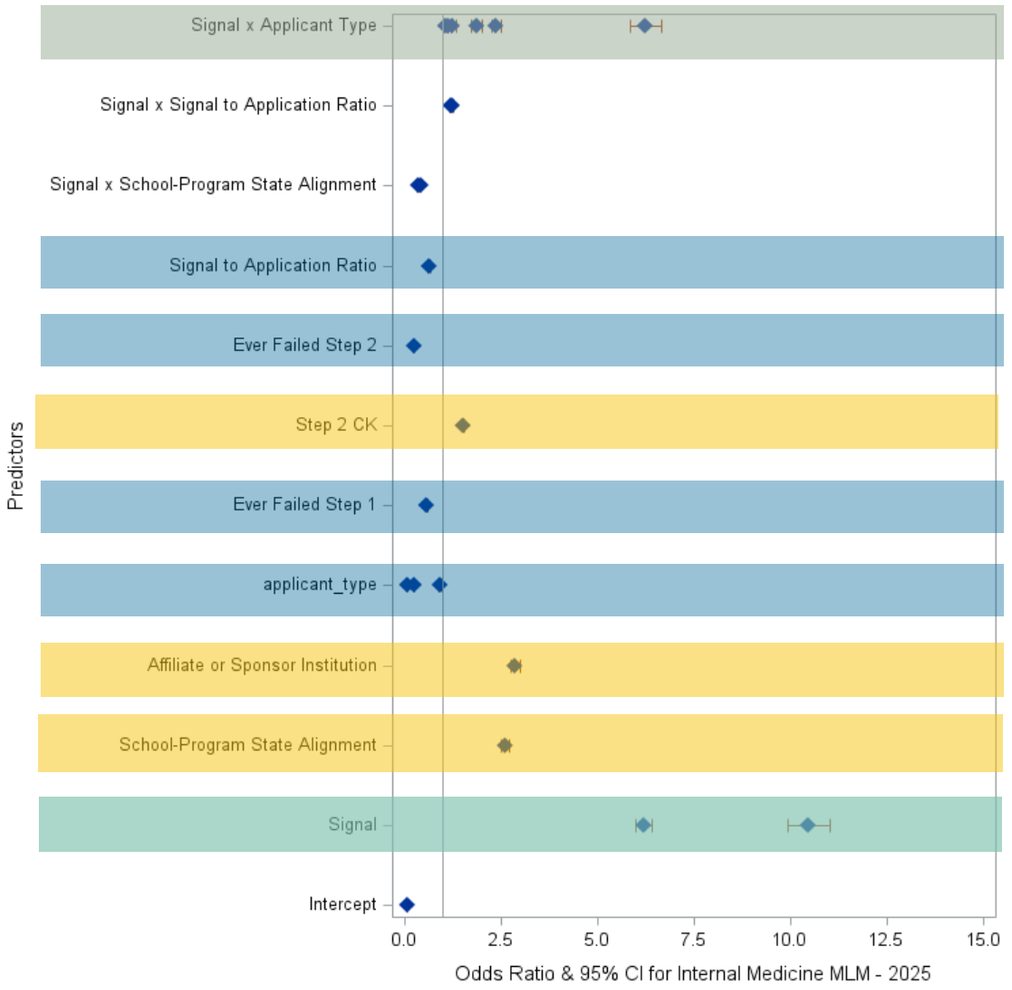
2025 Internal Medicine: (Tiered Signals)

Signals are the strongest predictor of interview invitation and placement on ROL

Interview Invitation



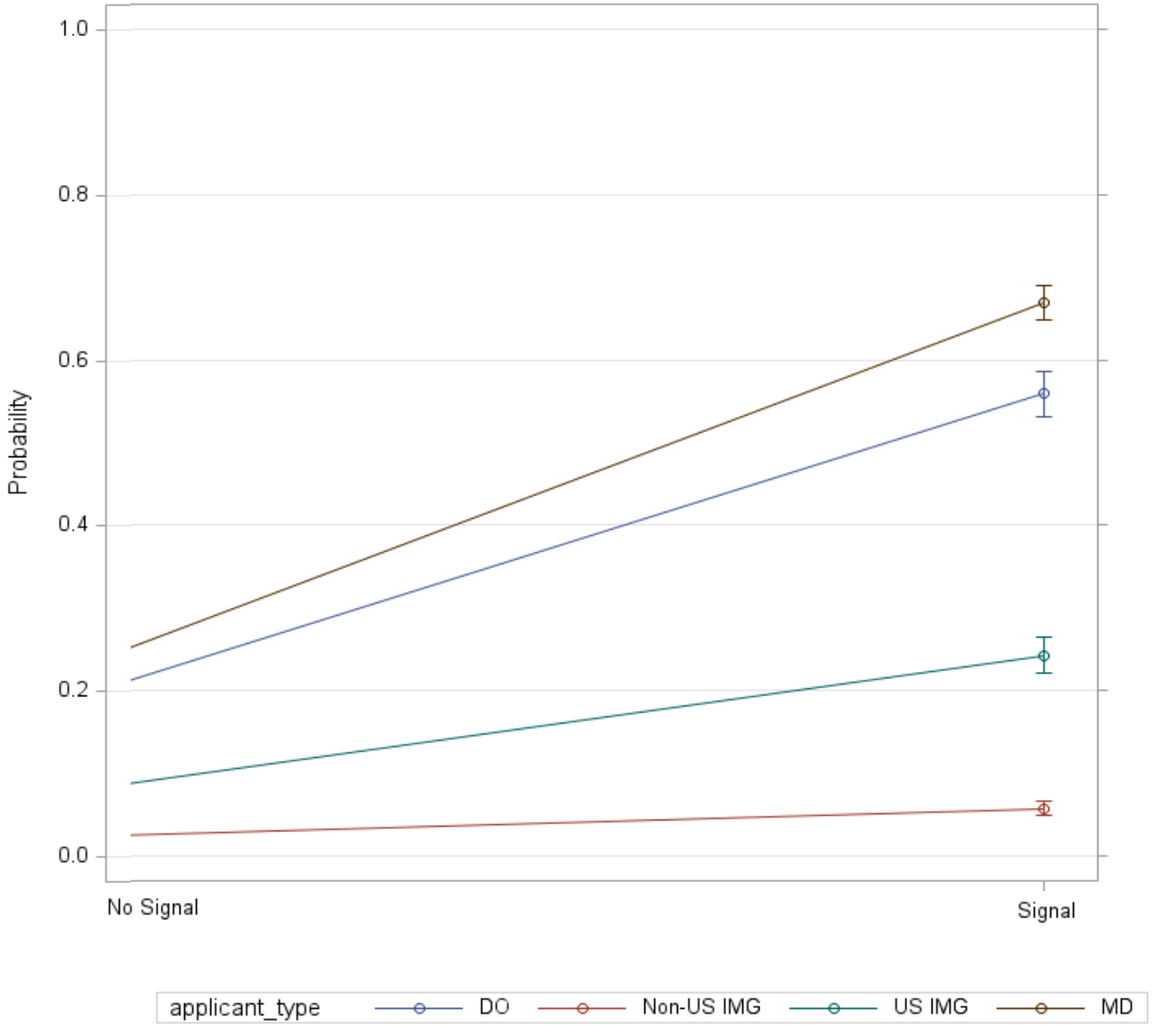
Ranked



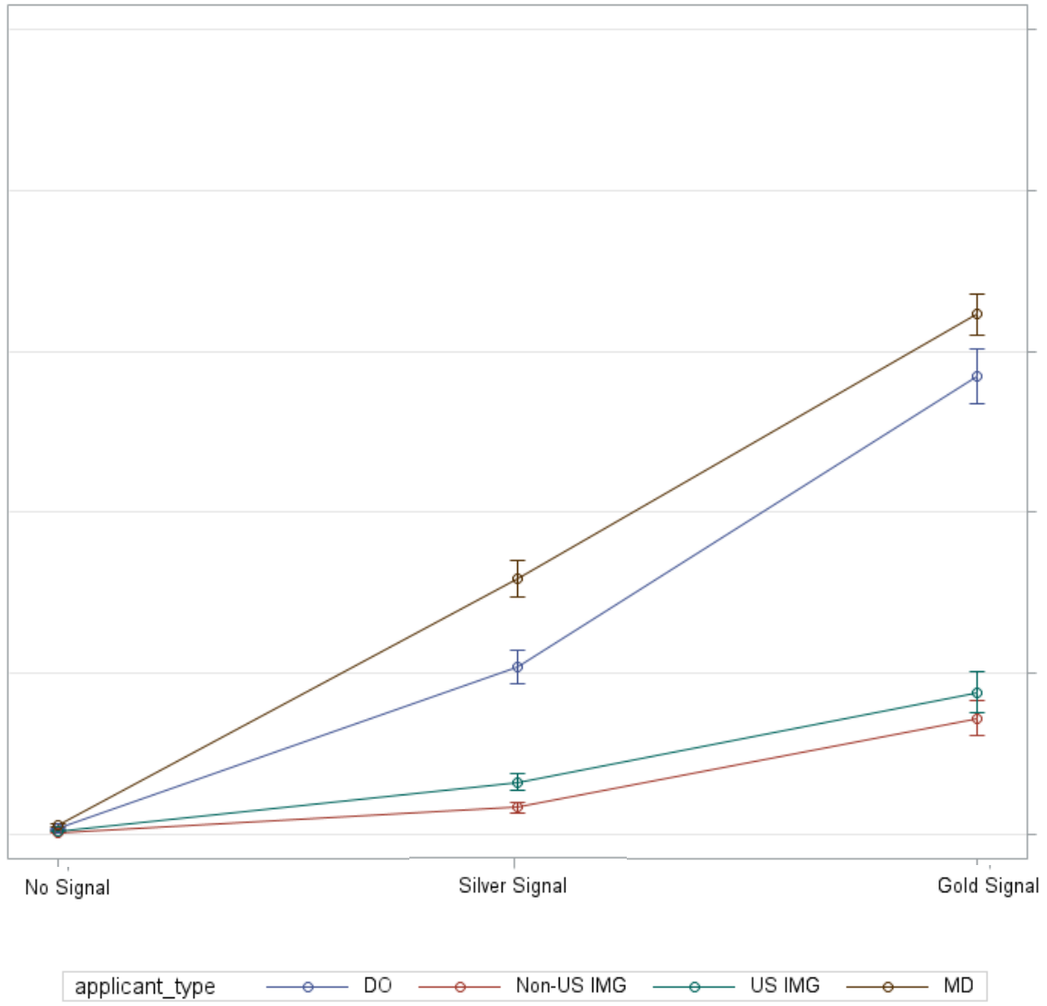
Signal X Applicant Type Interaction

The signaling effect is stronger for MD than DO and IMG applicants

Emergency Medicine (SNS)

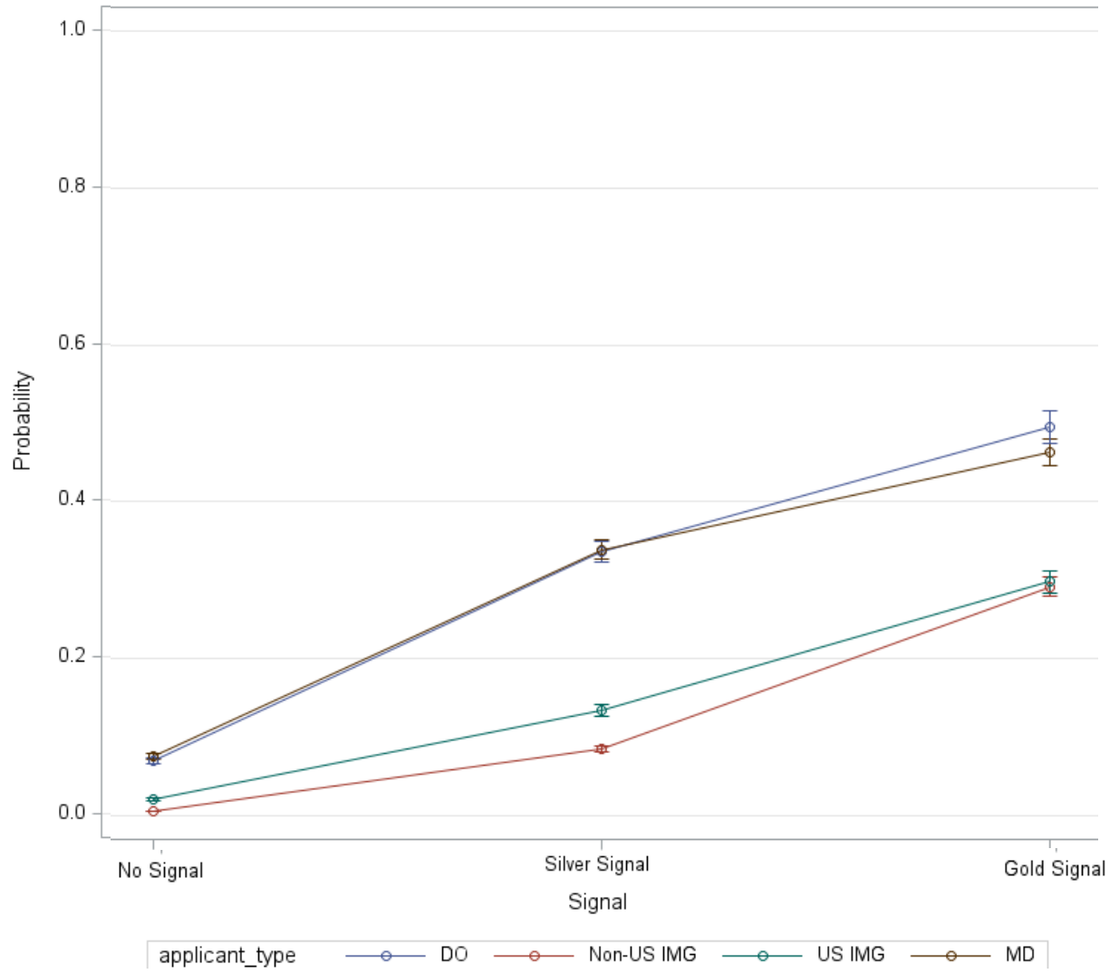


Anesthesiology (Tired)



The signaling effect is stronger for DO and IMG applicants than MDs

Internal Medicine (Tiered)



Conclusions, Limitations & Future Work

Discussion: Summary of Results

- Stating the obvious - signals matter immensely
- The signaling effect varies by applicant type, state alignment, and a programs signal to application ratio across specialties and outcomes.
- Selection process remains rather consistent across signal approach
  - Looking how various factors affect chance to interview by approach:

Signal Approach Summary

Predictor	Signal Approach		
	Small	Large	Two-Tiered
Signal	↑	↑	↑
State Alignment	↑	↑	↑
Sponsor/Affiliation	↑	↑	↑
Step 2 CK Score	↑	↑	↑
App Type: DO	↓	↓	↓
App Type: IMG	↓	↓	↓
Ever Failed USMLE	↓	↓	↓
Signal to App Ratio	↓	↓	↓

Signal Approach

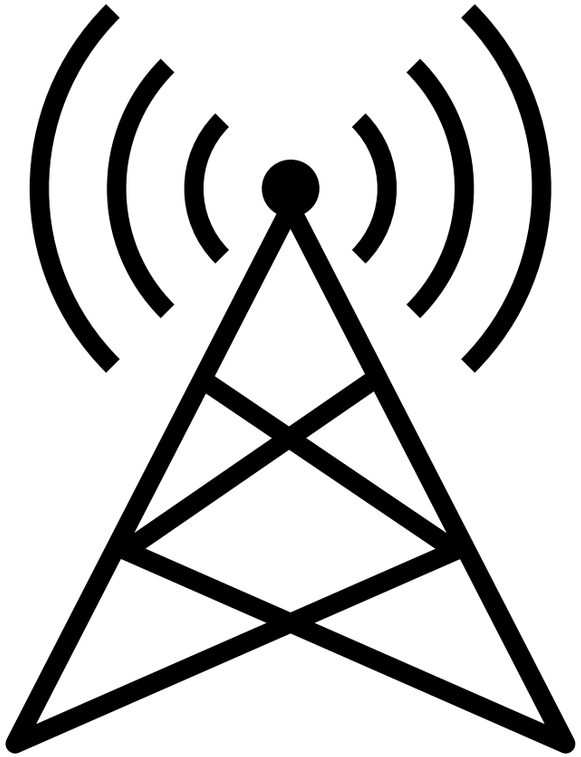
- However, there is a key difference in how the signal functions across approach
  - **Large signal** – signals are required; serves as a filter / application cap
  - **Small signal** – substantial impact on likelihood, but not required
  - **Tiered** – gold signals boost considerably; silver function depends on number
- Implications of this outcome should be considered by community
- Regardless, it is essential that all involved in T2R understand these ramifications and can make informed decisions.

Limitations and Future Plans

- **Limitations**
  - Small samples, particularly within certain group combinations
  - Lack of data on DOs who did not take USMLE
  - Did not model all variables
    - Analyses do not account for the impact of the interview experience on the relationship between signaling and ranking/matching
- **Future Plans**
  - Additional avenues to share results
  - Continued exploration of interaction effects (benefits to under selected groups)
  - Would be ideal to understand whether signals are reflective of interest and fit, but measuring this is incredibly complex

Conclusion

- Signals have a substantial impact on the residency selection process
- Essential that the community continues to transparently share details that facilitates informed actions
- Monitor outcomes to ensure alignment with intent of signal



Questions?

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