

## CONTENT EVALUATION OF THE NATIONAL RESIDENT MATCHING PROGRAM APPLICANT SURVEY: REFLECTIONS ON PROCESS AND LESSONS LEARNED

### RESEARCH BRIEF

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#### Background

The [National Resident Matching Program](#)<sup>®</sup> (NRMP<sup>®</sup>) has maintained a long-standing interest in characterizing the experiences of those who participate in the Main Residency Match<sup>®</sup>. That interest has, in part, been pursued annually through the administration of an Applicant or Program Director Survey. The NRMP administers the Program Director Survey in even Match years and the Applicant Survey in odd Match years. Data from these surveys are analyzed and made available on the NRMP's website to inform future applicants' decision making about specialties and programs to which they may wish to apply, and to convey information more broadly across medical education constituencies about applicant and program decision making at key stages of the transition to residency. The data are also increasingly used to help answer key questions about the transition to residency that are central to the NRMP's research agenda.

Both surveys were revised substantively in late 2020 to understand the impact of the pivot to virtual recruitment that was necessitated by the COVID-19 pandemic on those participating in the Match. To assess anticipated changes in experiences with virtual recruitment, the surveys were administered annually to both groups in 2021 and 2022. Revising the surveys to include questions related to the transition to virtual interviewing created a broader discussion among the NRMP's leadership about the need to evaluate survey content to ensure the questions being asked capture the experience of each group of survey respondents.

Accordingly, in 2022, the NRMP launched an initiative to engage in a comprehensive assessment of its surveys, identifying which pieces of the surveys are most critical and valuable to constituents versus those that might convey limited information or be redundant. The goals of these efforts were to maximize the information obtained from the surveys, and potentially inform changes to the surveys in the future, while also being considerate of respondent burden. This brief outlines the findings from that examination.

#### Survey Response Patterns

A key component of the Applicant Survey is the assessment of program and community characteristics applicants consider when applying to ("application stage") and subsequently ranking programs ("ranking stage"). Using the 2021 version of the Applicant Survey as the framework for analysis, there were approximately 55 characteristics that applicants were asked if they considered (e.g., salary, cost of living, program reputation, geographic location, visa concerns, quality of local children's schools). These items were asked about their decision-making at the application stage and then, separately, at the ranking stage. One additional item was exclusive to the set of characteristics related to the ranking stage, namely, the interview day experience. Respondents were asked to indicate the level of importance of each characteristic they reported considering to their decision-making process. Importance was assessed on a 5-point scale from 1 (not important) to 5 (extremely important). Notably,

respondents occasionally, though infrequently, endorsed characteristics they considered in their decisions but then assigned a rating of “not important.”

Because the same set of characteristics was evaluated for both the application and ranking stages, it was necessary to determine whether there was a meaningful distinction between applicants’ decision-making processes at each stage. Overall, respondents showed a small but consistent tendency to be more likely to endorse an item at the application stage than at the ranking stage. Looking at individual patterns of responses, some respondents endorsed a given item at the application but not the ranking stage, some endorsed a given item at the ranking but not the application stage, while others tended to endorse or not endorse a given item for both stages.

If a particular institution, program, or geographic region characteristic appears consistently considered (or not considered) by individuals, regardless of application or ranking stage, this may suggest that the characteristic exhibits redundancy across the two stages and may not need to be queried twice. For example, most individuals who indicated that visa sponsorship, their children’s education, their partner’s employment, osteopathic recognition, or community-based programs impacted their decisions for the application stage also showed a strong tendency to consider them at the ranking stage. This is based on correlations found in Table 1, where larger values indicate a stronger tendency to identify the same items for the survey’s application and ranking stages. A correlation of 1.0 would indicate two items are measuring exactly the same idea across stages of the transition to residency for all individual participants.

**Table 1. Correlations between application and ranking phase consideration items**

Item (application & rank)	Correlation <i>r<sub>tet</sub></i>
J1 Visa sponsorship	0.98
H1B Visa sponsorship	0.97
Local schools for children	0.89
Job opportunities for spouse/significant other	0.88
Osteopathic Recognition status	0.88
Community-based setting	0.81
Other support network in the area	0.79
Jeopardy pool	0.79
Having friends in the program	0.77
Cultural/racial/ethnic diversity of geographic location	0.77
Other benefits	0.76
Salary	0.75
Experience with virtual or in-person away/audition rotations	0.75
Academic medical center program	0.75
Presence of house staff union	0.74
Presence of a previous Match violation	0.74
Supplemental income (moonlighting) opportunities	0.73
Desired geographic location	0.73
Opportunity and financial support for international experience	0.72
Quality of ambulatory care facilities	0.72

Sick and bereavement leave policies	0.72
Board pass rates	0.72
Program-provided cell phone for work-related calls or phone stipend	0.71
Cultural/racial/ethnic/gender diversity at the institution	0.71
COVID-19 pandemic safety policies and procedures	0.70
Social and recreational opportunities of the area	0.70
Future fellowship training opportunities at the institution	0.68
Opportunities for training in systems-based practice	0.67
Future job opportunities for self	0.66
Vacation, personal, and family leave policies	0.66
Cost of living	0.66
Opportunity to perform specific procedures	0.66
Infectious disease (e.g., COVID-19, bloodborne pathogens) are taken seriously	0.65
Experience with other virtual publicity activities hosted by the program	0.65
Reputation of program	0.64
Structure or type of electronic health records	0.64
Preparation for fellowship training	0.64
Duty coverage to attend conferences	0.63
Call schedule	0.63
Quality of ancillary support staff	0.62
Career paths of recent program graduates	0.62
Size of patient caseload	0.61
Size of program	0.61
Work/life balance	0.59
Institutional provisions to ensure other domains of resident health, safety, and wellness	0.58
Diversity of patient problems	0.57
Rotation schedules and structures (e.g., amount of time per rotation) in program	0.55
Program's flexibility to pursue electives and interests	0.54
Quality of hospital facilities	0.54
House staff morale	0.51
Quality of program director	0.49
Quality of faculty	0.48
Quality of educational curriculum and training	0.47
Quality of residents in program	0.47
Balance between faculty supervision and resident responsibility for patient care	0.43

While there may be redundancies between the two sets of characteristics across the application and ranking stages, there may also be characteristics assessed within each stage that are redundant. For example, vacation and COVID safety policies and procedures may seem different based on how they are worded, but they may both be capturing the same underlying construct of personal benefits and disease safety. To determine if this was happening within either stage, exploratory factor analyses were conducted.

### Exploratory Factor Analyses

Exploratory factor is used to identify underlying constructs, or factors, that explain patterns of correlations within relatively large sets of observed variables such as program characteristics that applicants may consider in their decisions about applications and ranking. The exploratory factor analyses conducted on the 2021 Applicant Survey data revealed a series of potential conceptual categories subsuming groups of items to which applicants’ responses tended to be correlated (See Tables 2 and 3 for the groupings of items, based on statistics). For example, the largest category from the ranking stage (see Table 3) included 11 items that targeted vacation, salary, work-provided phone, sick and bereavement leave, work rotations, and work-life balance. That category was thus labeled “Work Benefits.” The category is distinct from other categories such as the one labeled “Training and Training Outcomes” in Table 3 that includes nine items such as fellowship opportunities, graduate career path opportunities, and duty coverage so that applicants could attend conferences. The categories derived from the items differ in some ways between application versus ranking stages, suggesting that even the overarching factors may take different forms at the different decision-making stages.

**Table 2. Application Stage Consideration Factors with Working Titles**

Item	Factor working title	# Items
Vacation, personal, and family leave policies	Personal benefits and disease safety	10
Program-provided cell phone for work-related calls or phone stipend		
Sick and bereavement leave policies		
Salary		
Jeopardy pool		
Supplemental income (moonlighting) opportunities		
Presence of house staff union		
COVID-19 pandemic safety policies and procedures		
Infectious disease (e.g., COVID-19, bloodborne pathogens) are taken seriously		
Call schedule		
Quality of faculty	Quality of coworkers, staffing	5
Quality of program director		
Quality of residents in the program		
Quality of ancillary support staff		
House staff morale		
Future fellowship training opportunities at the institution	Training and training outcomes	6
Preparation for fellowship training		
Academic medical center program		
Reputation of program		
Career paths of recent program graduates		
Opportunity and support (financial, mentoring) to conduct research and/or attend conferences		

Cultural/racial/ethnic diversity of geographic location	Diversity and culture	4
Cultural/racial/ethnic/gender diversity at the institution		
Diversity of patient problems		
Social and recreational opportunities of the area		
J1 Visa sponsorship	Visa concerns	2
H1B Visa sponsorship		
Quality of ambulatory care facilities	Quality of facilities	2
Quality of hospital facilities		
Experience with virtual or in-person away/audition rotations	Outreach and community interaction	4
Experience with other virtual publicity activities hosted by the program		
Osteopathic Recognition status		
Community-based setting		
Local schools for children	Family support	3
Cost of living		
Job opportunities for spouse/significant other		
Program's flexibility to pursue electives and interests	Program structure and flexibility	5
Rotation schedules and structures (e.g., amount of time per rotation) in program		
Quality of educational curriculum and training		
Balance between faculty supervision and resident responsibility for patient care		
Work/life balance		

**Table 3. Ranking Stage Consideration Factors with Working Titles**

Item	Factor working title	# Items
Vacation, personal, and family leave policies	Work benefits	11
Salary		
Cost of living		
Sick and bereavement leave policies		
Program-provided cell phone for work-related calls or phone stipend		
Call schedule		
Supplemental income (moonlighting) opportunities		
Work/life balance		
Jeopardy pool		
Rotation schedules and structures (e.g., amount of time per rotation) in program		
Other benefits		

Preparation for fellowship training	Training and training outcomes	9
Future fellowship training opportunities at the institution		
Opportunity and support (financial, mentoring) to conduct research and/or attend conferences		
Academic medical center program		
Career paths of recent program graduates		
Duty coverage to attend conferences		
Reputation of program		
Program's flexibility to pursue electives and interests		
Opportunity and financial support for international experience		
Overall goodness of fit	Work & community fit	6
Interview day experience		
Cultural/racial/ethnic diversity of geographic location		
Other support network in the area		
Quality of educational curriculum and training		
Social and recreational opportunities of the area		
Osteopathic Recognition status	Ancillary interactions & support	8
Experience with virtual or in-person away/audition rotations		
Community-based setting		
Opportunity to perform specific procedures		
Quality of ambulatory care facilities		
Experience with other virtual publicity activities hosted by the program		
Opportunities for training in systems-based practice		
Structure or type of electronic health records	Quality of coworkers, staffing	4
Quality of faculty		
Quality of program director		
Quality of residents in the program		
Quality of ancillary support staff	General wellness	4
Infectious disease (e.g., COVID-19, bloodborne pathogens) are taken seriously		
COVID-19 pandemic safety policies and procedures		
Institutional provisions to ensure other domains of resident health, safety, and wellness		
Presence of house staff union	Diversity and culture	3
Cultural/racial/ethnic diversity of geographic location		
Cultural/racial/ethnic/gender diversity at the institution		
Diversity of patient problems	Visa concerns	2
J1 Visa sponsorship		
H1B Visa sponsorship		

Local schools for children	Family support	3
Job opportunities for spouse/significant other		
Future job opportunities for self		

### Qualitative Analyses

The exploratory factor analyses were complemented by qualitative analyses of free-text fields related to compensation and benefits that allowed respondents to articulate program and community characteristics that impacted their decision-making at the application or ranking stages but that were not referenced in the set of structured (“check all that apply”) survey items. The free-text entries from the 2021 Applicant Survey were examined to determine if any common themes should be considered as potential additions to the survey when administered in future years. The thematic structure identified in the 2021 data was tested across application and ranking stages both for that year and against the 2022 data, and the framework generally held across stages and across years.

Three themes emerged from the free-text data that were substantial enough to warrant expanding the survey for 2023 and can be viewed in Table 4. They include non-salary benefits (e.g., insurance), salary benefits (e.g., signing bonuses, meals, parking), and professional/educational development benefits (e.g., funding for conference participation).

**Table 4. Themes and Resulting Survey Items based on Qualitative Analyses**

Theme	Example responses	Survey item
Non-salary benefits	“Comprehensive Health Insurance Coverage, Malpractice Coverage” “Quality of health insurance, availability of health insurance for partners” “Health, dental, and vision benefits”	Insurance benefits (life, health, dental, disability)
Salary benefits	“Relocation assistance” “401K matching” “Signing bonuses” “Free parking” “Meal stipends/free food”	Stipends to offset parking, food, or other on-duty expenses
Professional/educational development benefits	“Educational stipends” “Licenses/board fees/exams paid for by residency” “Education/technology fund (for conferences, loupes, lead, iPad, laptop)”	Funding for educational and professional development activities (CME classes, preparation for certification or licensure exams, professional equipment, or supplies)

### Future Directions

The NRMP conducted an evaluation of Applicant Survey content response patterns and engaged in exploratory factor and qualitative analyses to better understand what the survey data reveal about applicant experiences while also informing decision making regarding future updates and enhancements. The goal of this work is two-fold: surveys should be meaningful and capture the experiences of diverse groups of applicants, but, while comprehensive, should not also create unnecessary burden by including questions of low relevance.

The quantitative analyses were conducted using just one year of Applicant Survey data; accordingly, responses will need to be evaluated over time to make informed decisions as to whether additional items should be added, or existing ones removed from either the application or ranking stages of the survey. One consideration when assessing potential changes to the survey is the stability of the survey over time. Substantive changes could present challenges to comparisons of data from a new version with an older version as the validity of comparisons of data collected from the two versions would be unclear. It may be prudent to identify a core set of items that are expected to be permanent and retained across all versions of the survey while also establishing a section of the survey for “special” items that are viewed as temporary and/or to explore topics of current interest to the community.

In addition to continuing these quantitative and qualitative efforts to inform potential updates over time, there are other avenues that might be explored. One would involve determining whether respondents are interpreting the survey instructions and items in the ways we intend them to do. For example, when asked whether something was considered in ranking decisions, individuals might interpret this as “considered in the decision to rank a program or not at all” or as “considered in the decision to rank a program higher than another.” Different individuals may gravitate toward one interpretation more than the other, and this may affect their responses. The degree to which this is happening remains unknown; however, it is an important consideration regarding how the survey might be adapted and whether language usage in individual items may prevent or reduce these potential ambiguities.

Although items are not being removed from the Applicant Survey at this time, this work represents an important first step toward understanding the data to inform future iterations of the survey as well as laying the foundation for engaging in the same work with the Program Director Survey. The NRMP is pleased to share this work to offer insight into the ways that we continually think about the data we collect from the community, the deliverables we base on those data, and how we approach the work of understanding the stories the data can tell about, and help inform improvements to, the transition to residency.