



Charting Outcomes in the Match: Senior Students of U.S. MD Medical Schools

**Characteristics of U.S. MD Seniors Who Matched to Their
Preferred Specialty in the 2022 Main Residency Match**

3rd Edition

Prepared by:
National Resident Matching Program
www.nrmp.org

July 2022

Questions about the contents of this publication may be directed to National Resident Matching Program, (202) 400-2233 or datarequest@nrmp.org.

Questions about the NRMP should be directed to Donna L. Lamb, D.HSc., M.B.A., B.S.N., President and CEO, National Resident Matching Program, (202) 400-2233 or admin@nrmp.org.

Copyright ©2022 National Resident Matching Program, 2121 K Street, NW, Suite 1000, Washington, DC 20037 USA. All rights reserved. Permission to use, copy and/or distribute any documentation and/or related images from this publication shall be expressly obtained from the NRMP.

National Resident Matching Program, Charting Outcomes in the Match: Senior Students of U.S. Medical Schools, 2022. National Resident Matching Program, Washington, DC 2022.

Introduction	ii
Tables and Charts for All Specialties	
Chart 1. Active Applicants in the 2022 Main Residency Match.....	2
Table 1. Number of Applicants and Positions in the 2022 Main Residency Match	3
Chart 2. Ratio of U.S. MD Seniors Ranking Specialty First / Available Positions	4
Chart 3. Match Rates of U.S. MD Seniors.....	5
Table 2. Summary Statistics on U.S. MD Seniors	6
Chart 4. Median Number of Contiguous Ranks of U.S. MD Seniors	7
Chart 5. Mean Number of Different Specialties Ranked of U.S. MD Seniors	8
Chart 6. USMLE Step 1 Scores of U.S. MD Seniors.....	9
Chart 7. USMLE Step 2 CK Scores of U.S. MD Seniors	10
Chart 8. Mean Number of Research Experiences of U.S. MD Seniors	11
Chart 9. Mean Number of Abstracts, Presentations, and Publications of U.S. MD Seniors.....	12
Chart 10. Mean Number of Work Experiences of U.S. MD Seniors.....	13
Chart 11. Mean Number of Volunteer Experiences of U.S. MD Seniors	14
Chart 12. Percentage of U.S. MD Seniors Who are Members of AOA.....	15
Chart 13. Percentage of U.S. MD Seniors Graduating from One of the 40 Medical Schools with the Highest NIH Funding.....	16
Chart 14. Percentage of U.S. MD Seniors Who Have a Graduate Degree	17
Tables and Charts for Individual Specialties	
Anesthesiology	18
Child Neurology	27
Dermatology	36
Diagnostic Radiology	45
Emergency Medicine	54
Family Medicine	63
General Surgery	72
Internal Medicine	81
Internal Medicine/Pediatrics	90
Interventional Radiology	99
Neurological Surgery	108
Neurology	117
Obstetrics and Gynecology	123
Orthopaedic Surgery	135
Otolaryngology	144
Pathology	153
Pediatrics	162
Physical Medicine and Rehabilitation	171
Plastic Surgery	180
Psychiatry	189
Radiation Oncology.....	198
Vascular Surgery	207

Background

The first edition of *Charting Outcomes in the Match* was published in August 2006 to document how applicant qualifications affect outcomes in the Main Residency Match®. The report was published biennially between 2007 and 2011 and, initially, was a collaboration of the National Resident Matching Program® (NRMP®) and the Association of American Medical Colleges® (AAMC®). Match outcome data from the NRMP were combined with applicant characteristics from the AAMC's Electronic Residency Application Service (ERAS®) and United States Medical Licensing Examination (USMLE®) scores from the AAMC data warehouse. Starting with the 2014 Main Residency Match, the NRMP added an Academic Information section to its Match registration process to collect the USMLE scores and other applicant characteristics, and those have been used to independently produce all subsequent *Charting Outcomes in the Match* reports.

Prior to 2016, this report examined the Match success of only two applicant groups: senior students from U.S. MD medical schools ("U.S. seniors" or "U.S. MD seniors") and independent applicants. Independent applicants included all applicant types other than U.S. seniors: graduates of U.S. MD medical schools, students/graduates of U.S. DO medical schools, students/graduates of Fifth Pathway programs, students/graduates of Canadian medical schools, and U.S. citizen and non U.S. citizen students/graduates of international medical schools (IMGs). Because independent applicants are a heterogeneous group, a decision was made in 2016 to report data separately for U.S. MD medical school seniors, students/graduates of U.S. DO medical schools, and U.S. citizen/non-U.S. citizen students/graduates of international medical schools. In 2018, upon requests from U.S. DO medical schools, the *Charting Outcomes in the Match* report was redesigned to include only senior students of U.S. DO medical schools ("U.S. DO seniors"), eliminating the reporting on U.S. DO graduates because their numbers are so small. The 2022 *Charting Outcomes in the Match* reports marks the third iteration of publications for U.S. MD Seniors, U.S. DO seniors and U.S. citizen/non-U.S. citizen IMGs. This report examines the characteristics of U.S. MD seniors.

Data

Match outcome, specialty preference, and ranking information were collected through the Main Residency Match. The 40 U.S. medical schools receiving the highest totals of National Institutes of Health (NIH) grants were obtained from the NIH website. Other applicant characteristics, including USMLE Step 1 and Step 2 Clinical Knowledge (CK) scores, academic degrees, publications, Alpha Omega Alpha Honor Medical Society (AOA) membership, as well as research, work and volunteer experiences, were self-reported through the Academic Information section of the NRMP's Applicant Registration Form for the Match. To complete the form, applicants were asked to answer the questions as they did in their ERAS Common Application Form (CAF). Completion of the form was optional, and applicants who completed the form could consent or decline to participate in NRMP research. Data collection for the self-reported Academic Information section was granted exemption by the Advarra Institutional Review Board (IRB).

A total of 19,902 U.S. MD seniors submitted certified rank order lists in the 2022 Main Residency Match. After excluding the 17 percent of U.S. MD seniors who did not give consent to participate in NRMP research, 16,510 applicants were included in the final dataset. Missing data were found in Step 1 scores (1% missing), Step 2 CK scores (2.4%), number of research experiences (10.8%), number of abstracts, presentations, and publications (10.9%), number of work experiences (11.2%), number of volunteer experiences (11.2%), Ph.D. degree (5.2%), other graduate degree (5.4%), and AOA membership (7.8%).

To ensure that USMLE Step scores were not misreported, the NRMP asked medical schools to verify the scores of their U.S. MD seniors. In 2022, 90.2 percent of the Step 1 scores and 90.6 of the Step 2 CK scores used in this report were verified, corrected, or supplied by U.S. medical schools. Because the self-reported scores are highly accurate (the intraclass correlation coefficient (ICC) between the self-reported scores and school-verified scores was 0.958 (99% CI [0.956, 0.959]) for Step 1 scores and 0.932 (99% CI [0.929, 0.935]) for Step 2 CK scores), both verified and unverified scores were used to prepare this report.

Methods

Specialties that offered 50 or more positions in the 2022 Main Residency Match are included in this report. Over the years, specialties have been added to the report, including Otolaryngology and Neurology in 2007, Neurological Surgery in 2009, Child Neurology and Vascular Surgery in 2014, and Interventional Radiology in 2018. Transitional Year programs were excluded beginning with the 2011 report because they are not viewed as a preferred specialty choice.

Twelve measures are incorporated in this report. Probability analysis using a simple logistic regression model was introduced in 2009 to evaluate the relationship between Match outcome and contiguous ranks and USMLE Step 1 scores. Probability analyses in this report used data on U.S. MD seniors who participated in the Match in 2020, 2021, and 2022.

This report examines whether a match was made to the specialty of the applicant's first-ranked program, or "preferred specialty," because that is assumed to be the specialty of choice. U.S. MD Seniors who match to a specialty not ranked first on the rank order list or who do not match are not included in analyses. No distinction was made based on whether applicants matched to the first, second, third, or lower choice program.

Summary

Some general observations apply to all specialties in this report. U.S. MD seniors who match to their preferred specialty are more likely to:

- Rank more programs within their preferred specialty
- Have higher USMLE Step 1 and Step 2 scores
- Be members of Alpha Omega Alpha Honor Medical Society

It is important to note that other factors also likely contribute to matching to a preferred specialty. As examples, the data sources used for *Charting Outcomes in the Match* do not include important applicant factors such as course evaluations, reference letters, and the Medical School Performance Evaluation (MSPE).

Despite the fairly strong relationship between USMLE Step scores and matching to a preferred specialty, the distributions of scores show that program directors consider other qualifications. A high score is not a guarantee of matching, and a low score is not a bar to matching. In the more competitive specialties, U.S. MD seniors with high scores may not match to their preferred specialties. In less competitive specialties, U.S. MD seniors with scores slightly above passing usually match to their preferred specialties. The data are reassuring because they indicate that some programs do not employ an arbitrary cutoff or decline to consider applicants with less competitive scores.

The data in this report support the following straightforward advice one should give to an applicant:

- Rank the programs with which you've interviewed in the order you most prefer them.
- Include a mix of both competitive and less competitive programs within your preferred specialty.
- Include all programs on your list where you would be willing to train if matched.
- Include all of your qualifications in your application but know that you do not have to be AOA, have the highest USMLE scores, have publications, or have participated in research projects to match to your preferred specialty.

Program directors and applicants will find the tables and charts for the specialty of their particular interest later in this report.

For questions, comments or more information, please contact:

National Resident Matching Program
2121 K Street, NW, Suite 1000
Washington, DC 20037
Tel: (202) 400-2233
Email: datarequest@nrmp.org



Tables and Charts for All Specialties

AN Anesthesiology

Table AN-1 **Summary Statistics on U.S. MD Seniors**
Anesthesiology

Measure	Matched (n=1,050)	Unmatched (n=119)
1. Mean number of contiguous ranks	15.7	6.3
2. Mean number of distinct specialties ranked	1.4	1.9
3. Mean USMLE Step 1 score	237	221
4. Mean USMLE Step 2 score	248	231
5. Mean number of research experiences	3.7	3.1
6. Mean number of abstracts, presentations, and publications	6.6	4.4
7. Mean number of work experiences	3.5	3.4
8. Mean number of volunteer experiences	7.7	6.5
9. Percentage who are AOA members	12.3	1.7
10. Percentage who graduated from one of the 40 U.S. medical schools with the highest NIH funding	32.1	21.0
11. Percentage who have Ph.D. degree	2.0	0.9
12. Percentage who have another graduate degree	18.7	21.6

Note: Only U.S. MD seniors who gave consent to use their information in research are included.

Sources: NRMP Data Warehouse; Top 40 U.S. medical schools with the highest NIH funding in measure 10 is from the NIH website (<http://report.nih.gov/award/index.cfm>).

Chart AN-1

**Number of Distinct Specialties Ranked by U.S. MD Seniors
Anesthesiology**

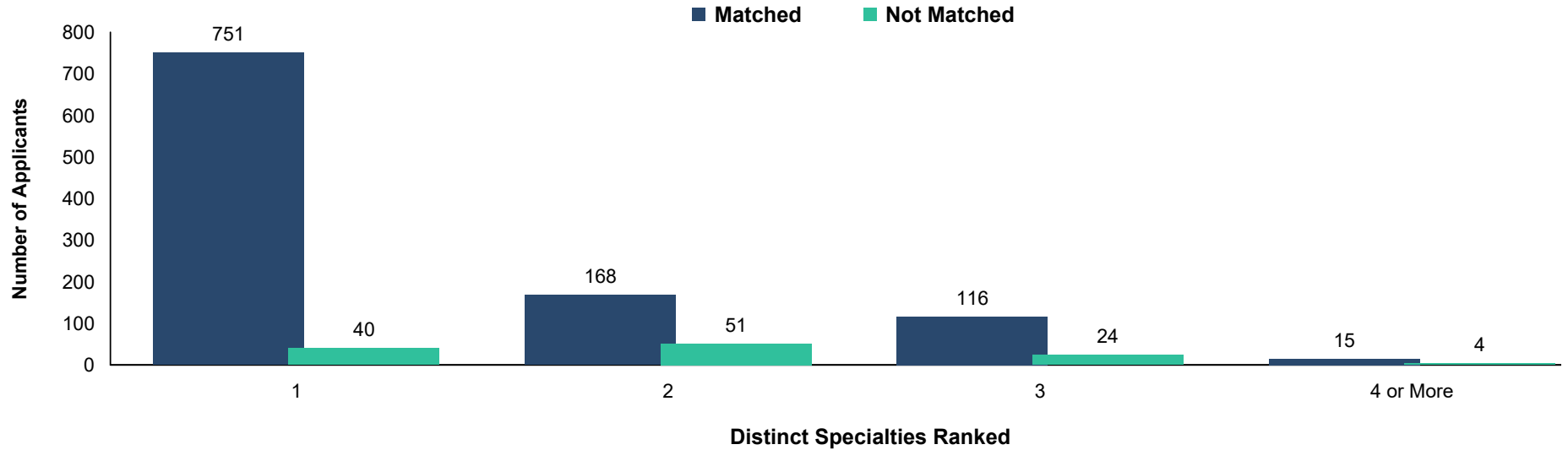
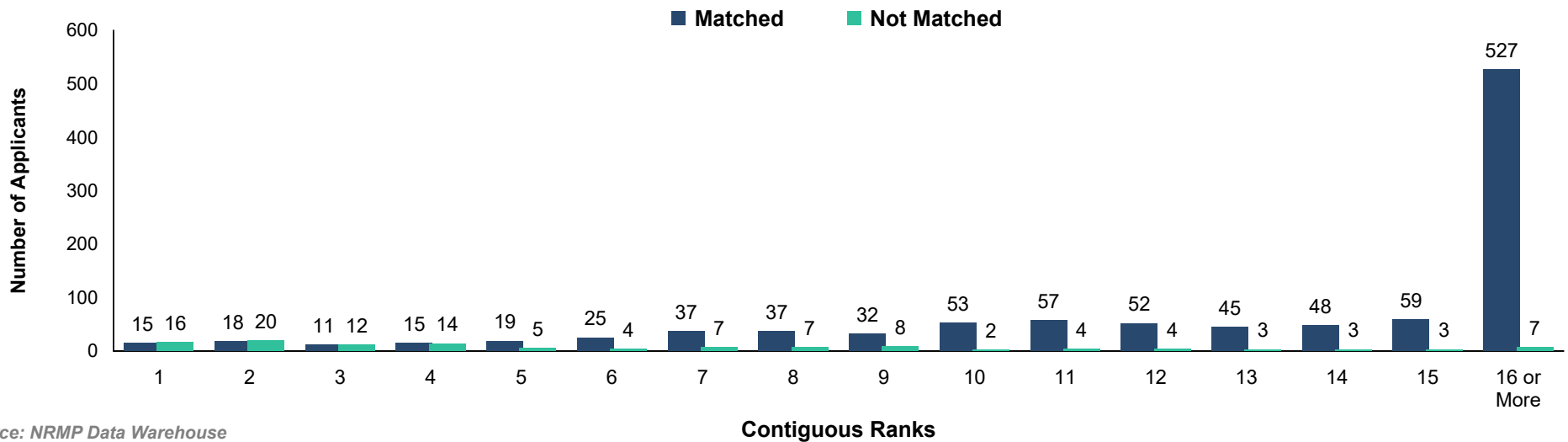


Chart AN-2

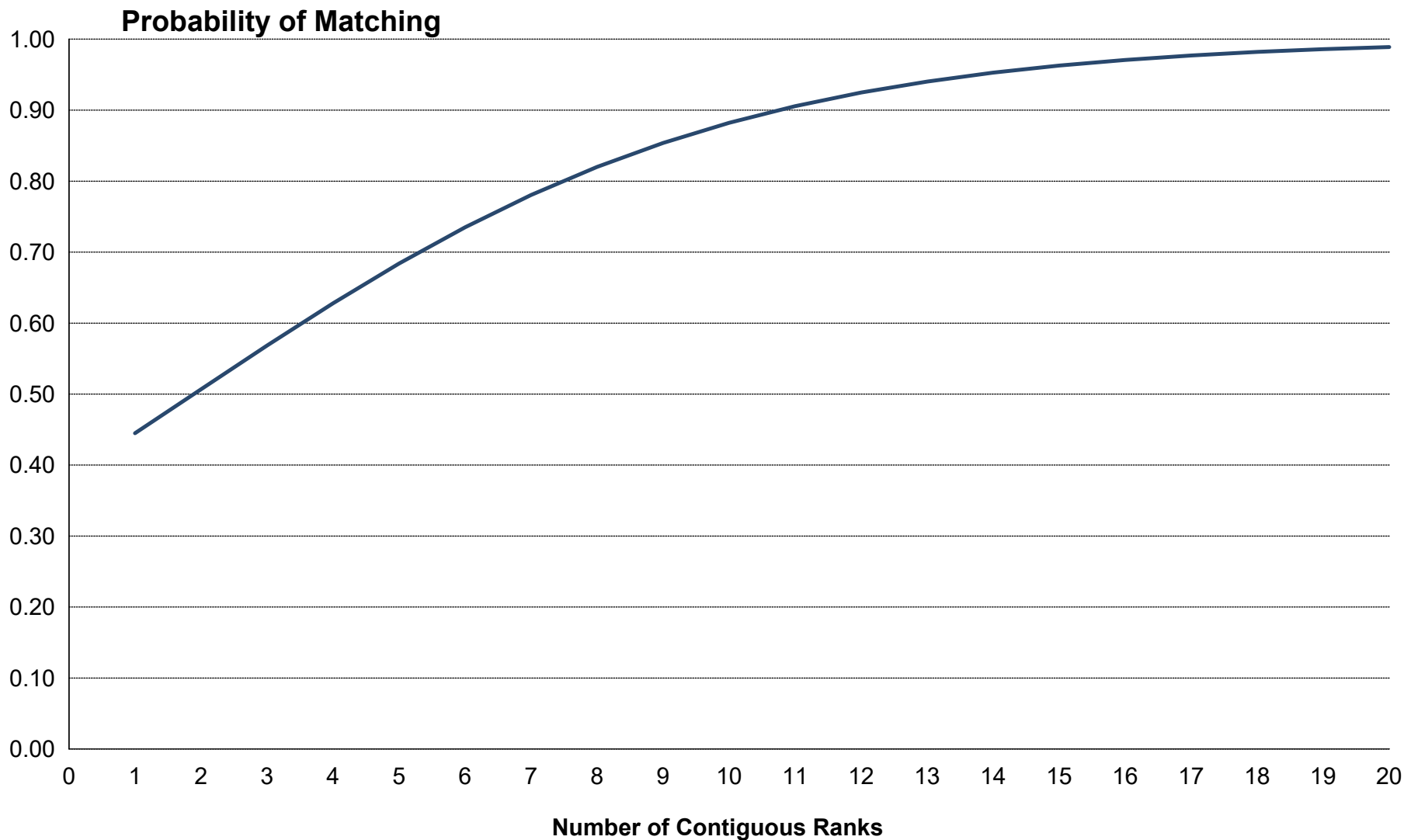
**Number of Contiguous Ranks of U.S. MD Seniors
Anesthesiology**



Source: NRMP Data Warehouse

**Graph
AN-1**

Probability of U.S. MD Seniors Matching to Preferred Specialty by Number of Contiguous Ranks
Anesthesiology



Source: NRMP Data Warehouse. Note: Probabilities calculated based on 2020-2022 applicants

Chart AN-3

**USMLE Step 1 Scores of U.S. MD Seniors
Anesthesiology**

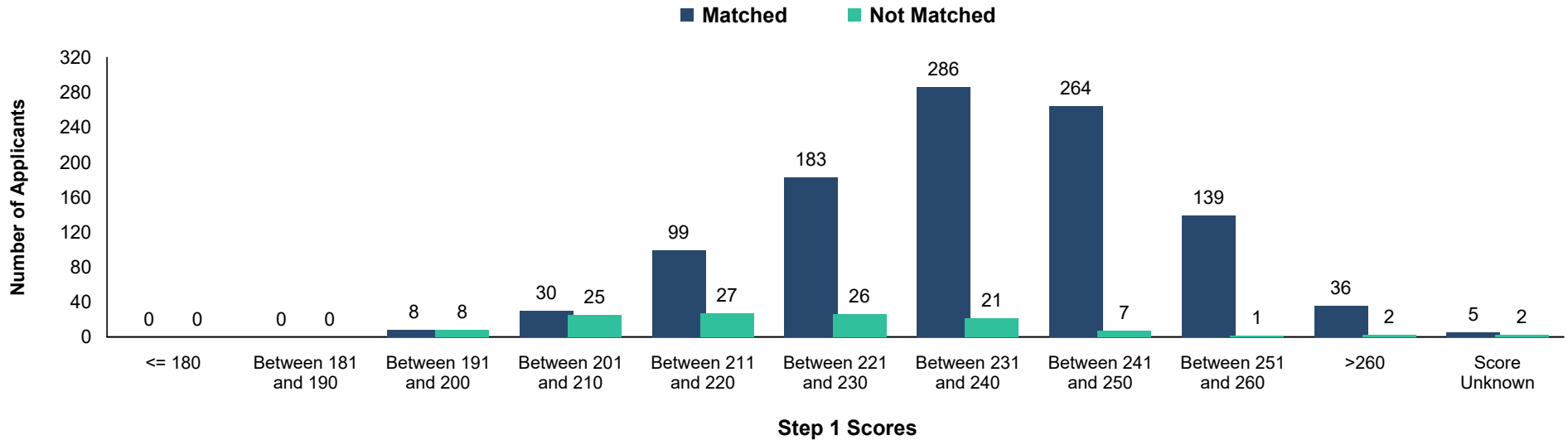
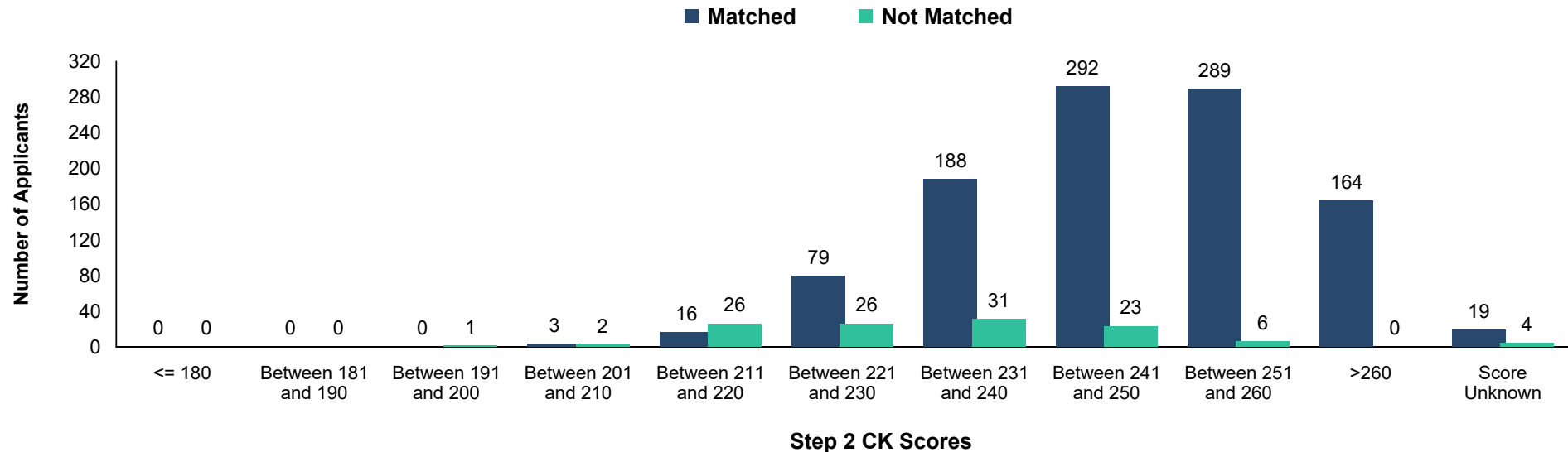
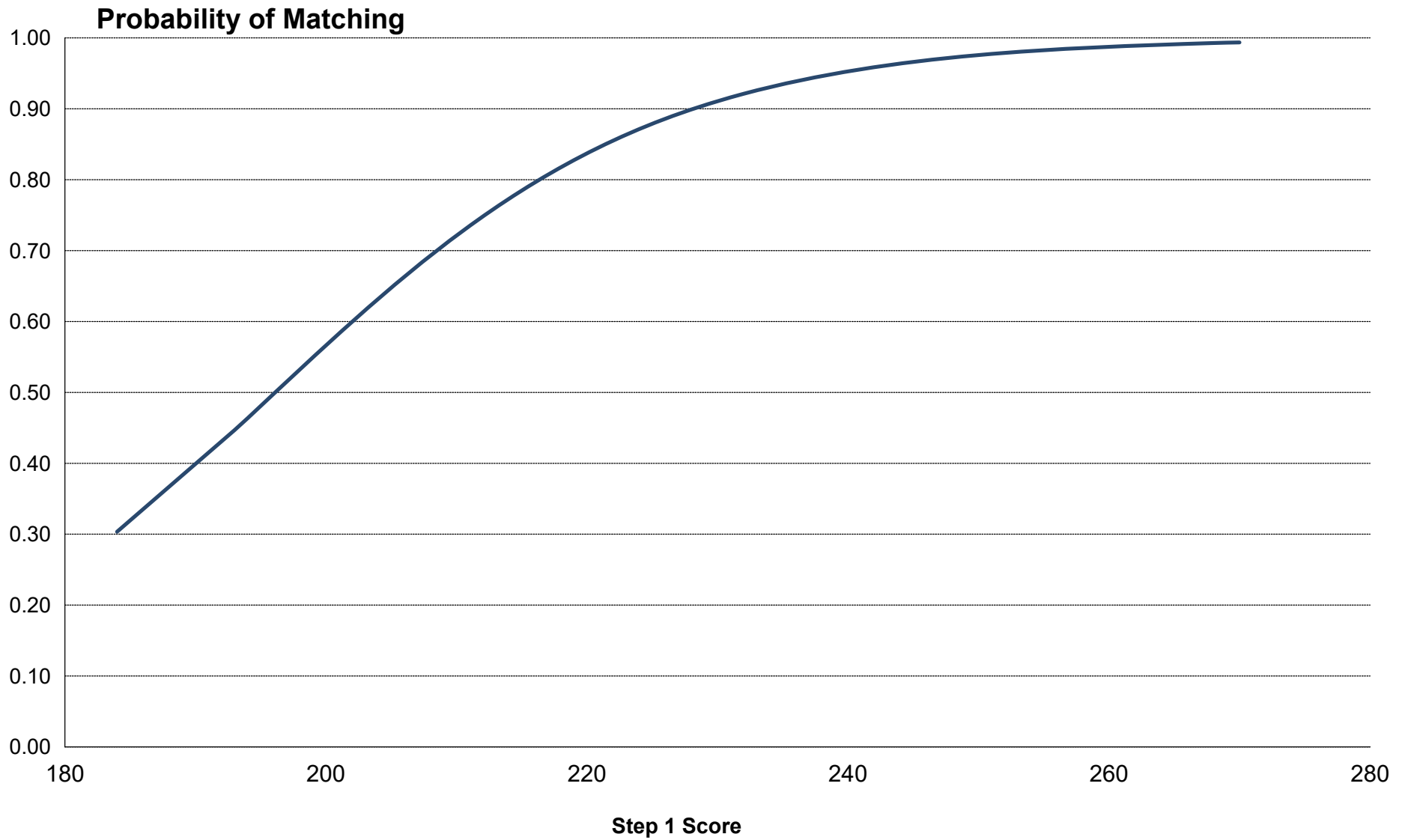


Chart AN-4

**USMLE Step 2 CK Scores of U.S. MD Seniors
Anesthesiology**



Probability of U.S. MD Seniors Matching to Preferred Specialty by USMLE Step 1 Score *Anesthesiology*



Source: NRMP Data Warehouse. Note: Probabilities calculated based on 2020-2022 applicants.

Chart AN-5

Number of Research Projects of U.S. MD Seniors *Anesthesiology*

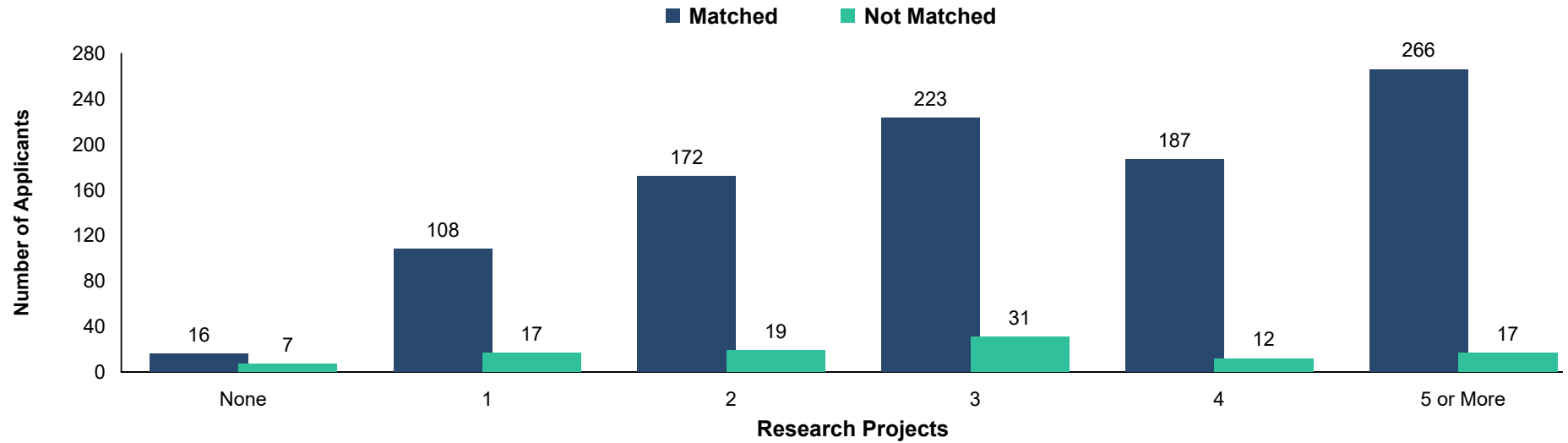
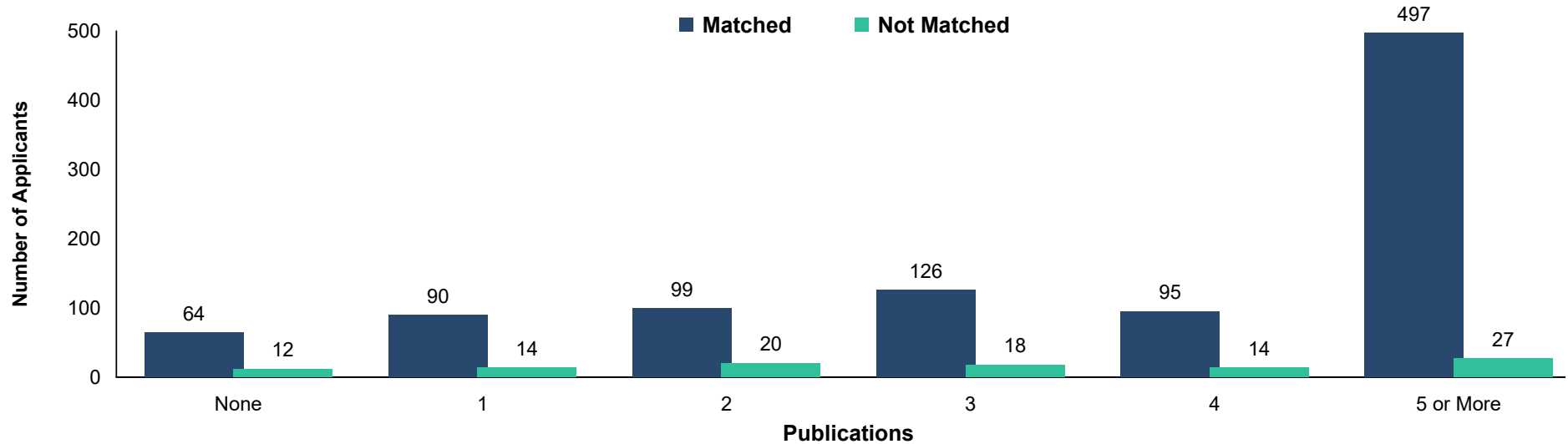


Chart AN-6

Number of Abstracts, Presentations, and Publications of U.S. MD Seniors *Anesthesiology*



Source: NRMP Data Warehouse

Chart AN-7 Number of Work Experiences of U.S. MD Seniors
Anesthesiology

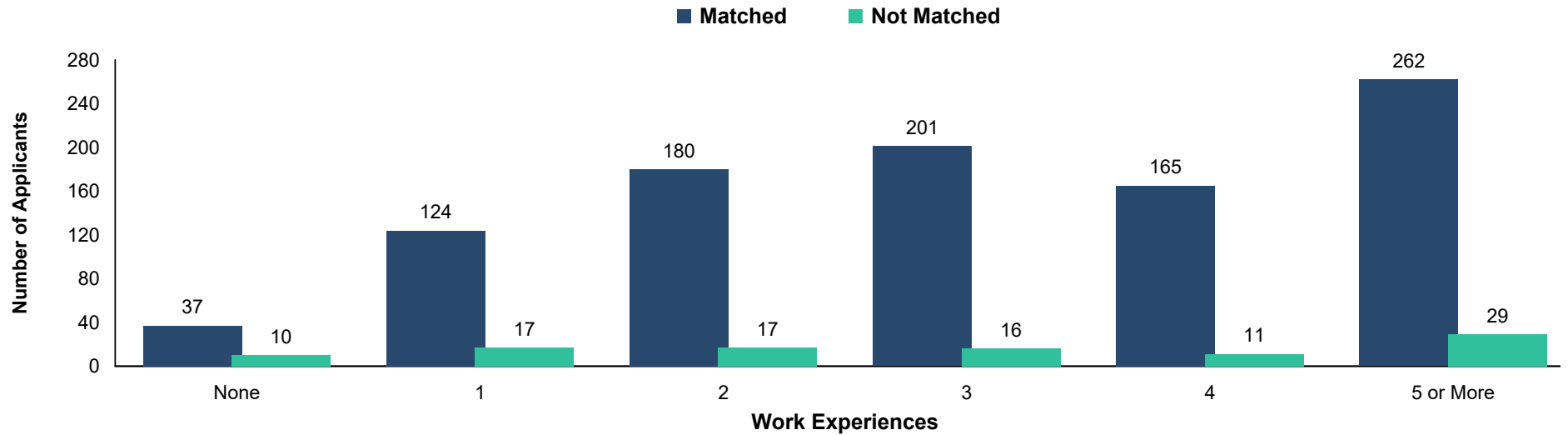
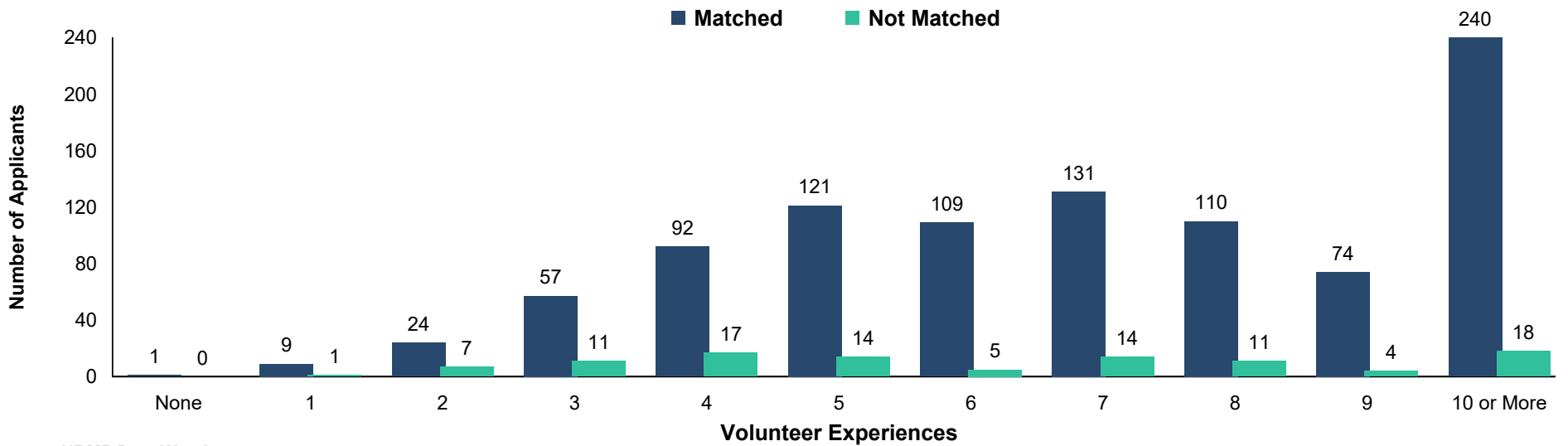


Chart AN-8 Number of Volunteer Experiences of U.S. MD Seniors
Anesthesiology

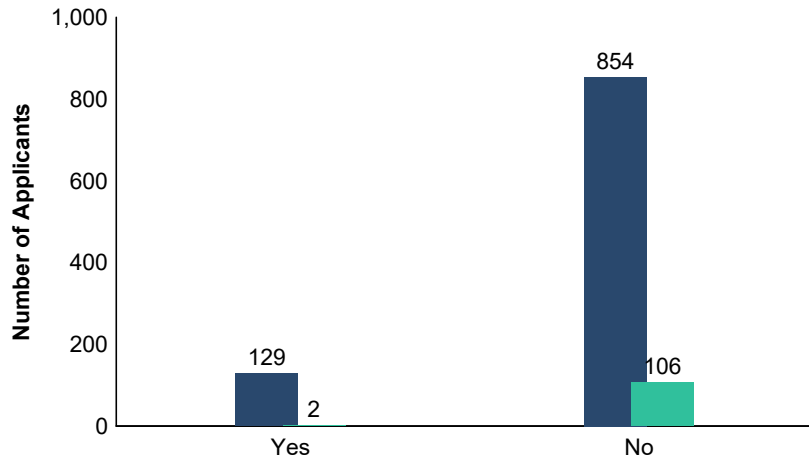


Source: NRMP Data Warehouse

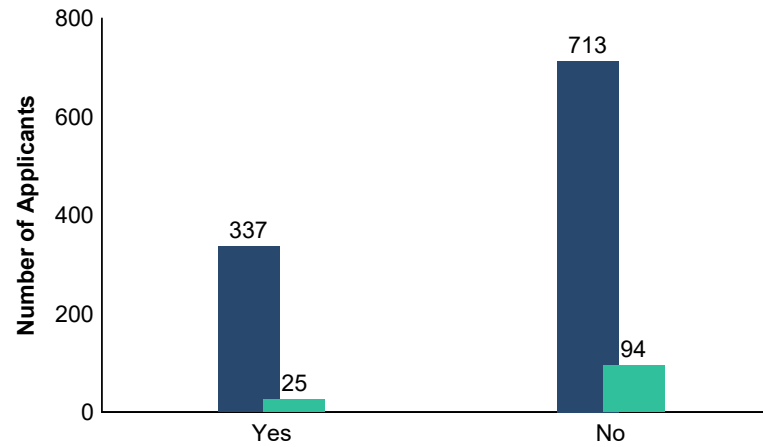
**Other Characteristics of U.S. MD Seniors
Anesthesiology**

■ Matched ■ Not Matched

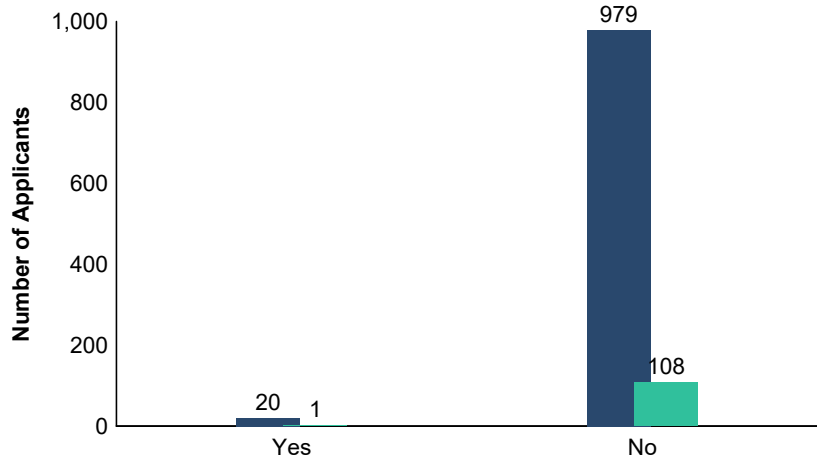
AOA Membership



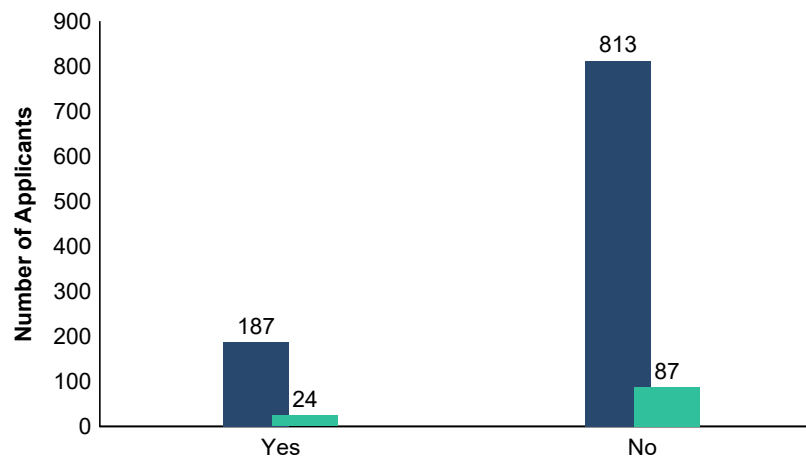
Graduate of One of the 40 U.S. Medical Schools with the Highest NIH Funding



Ph.D. Degree



Other Graduate Degree



Source: NRMP Data Warehouse. Top 40 U.S. medical schools with the highest NIH funding from NIH: <http://report.nih.gov/award/index.cfm>