US Dermatology Residency Program Rankings Based on Academic Achievement

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PRACTICE **POINTS**

- Dermatology is not among the many hospital-based adult specialties that are routinely ranked annually by *US News & World Report.*
- In the current study, US dermatology residency programs were ranked based on various academic factors, including the number of full-time faculty members, amount of National Institutes of Health funding received in 2014, number of publications by full-time faculty members in 2014, and the number of faculty lectures given at annual meetings of 5 societies in 2014.

This study provides rankings of individual US dermatology residency programs based on a number of factors, including annual amount of National Institutes of Health (NIH) funding received in 2014, number of publications by full-time faculty members in 2014, and number of faculty lectures given at 5 annual society meetings. The overall ranking of the top 20 US dermatology residency programs is given as well as the top 5 programs for the factors most reflective of academic achievement.

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Rankings of US residency programs based on academic achievement are a resource for fourth-year medical students applying for residency through the National Resident Matching Program. They also highlight the leading academic training programs in each medical specialty. Currently, the Doximity Residency Navigator (https://residency.doximity.com) provides rankings of US residency programs based on either subjective or objective criteria. The subjective rankings utilize current resident and recent alumni satisfaction surveys as well as nominations from board-certified Doximity members who were asked to nominate up to 5 residency programs in their specialty that offer the best clinical training. The objective rankings are based on measurement of research output, which is calculated from the collective *h*-index of publications authored by graduating alumni within the last 15 years as well as the amount of research funding awarded.[1]

Aquino et al[2] provided a ranking of US dermatology residency programs using alternative objective data measures (as of December 31, 2008) from the Doximity algorithm, including National Institutes of Health (NIH) and Dermatology Foundation (DF) funding, number of publications by full-time faculty members, number of faculty lectures given at annual meetings of 5 societies, and number of full-time faculty members serving on the editorial boards of 6 dermatology journals. The current study is an update to those rankings utilizing data from 2014.

Methods

The following data for each dermatology residency program were obtained to formulate the rankings: number of full-time faculty members, amount of NIH funding received in 2014 (https://report.nih.gov/), number of publications by full-time faculty members in 2014 (http://www.ncbi.nlm.nih.gov/pubmed/), and the number of faculty lectures given at annual meetings of 5 societies in 2014 (American Academy of Dermatology, the Society for Investigative Dermatology, the American Society of Dermatopathology, the Society for Pediatric Dermatology, and the American Society for Dermatologic Surgery). This study was approved by the institutional review board at Kaiser Permanente Southern California.

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The names of all US dermatology residency programs were obtained as of December 31, 2014, from FREIDA Online using the search term *dermatology*. An email was sent to a representative from each residency program (eg, residency program coordinator, program director, full-time faculty member) requesting confirmation of a list of full-time faculty members in the program, excluding part-time and volunteer faculty. If a response was not obtained or the representative declined to participate, a list was compiled using available information from that residency program's website.

National Institutes of Health funding for 2014 was obtained for individual faculty members from the NIH Research Portfolio Online Reporting Tools expenditures and reports (https://projectreporter.nih.gov/reporter.cfm) by searching the first and last name of each full-time faculty member along with their affiliated institution. The search results were filtered to only include NIH funding for full-time faculty members listed as principal investigators rather than as coinvestigators. The fiscal year total cost by institute/center for each full-time faculty member's projects was summated to obtain the total NIH funding for the program.

The total number of publications by full-time faculty members in 2014 was obtained utilizing a PubMed search of articles indexed for MEDLINE using each faculty member's first and last name. The authors' affiliations were verified for each publication, and the number of publications was summed for all full-time faculty members at each residency program. If multiple authors from the same program coauthored an article, it was only counted once toward the total number of faculty publications from that program.

Program brochures for the 2014 meetings of the 5 societies were reviewed to quantify the number of lectures given by full-time faculty members in each program.

Each residency program was assigned a score from 0 to 1.0 for each of the 4 factors of academic achievement analyzed. The program with the highest number of faculty publications was assigned a score of 1.0 and the program with the lowest number of publications was assigned a score of 0. The programs in between were subsequently assigned scores from 0 to 1.0 based on the number of publications as a percentage of the number of publications from the program with the most publications.

A weighted ranking scheme was used to rank residency programs based on the relative importance of each factor. There were 3 factors that were deemed to be the most reflective of academic achievement among dermatology residency programs: amount of NIH funding received in 2014, number of publications by full-time faculty members in 2014, and number of faculty lectures given at society meetings in 2014; thus, these factors were given a weight of 1.0. The remaining factor—total number of full-time faculty members—was given a weight of 0.5. Values were totaled and programs were ranked based on the sum of these values. All quantitative analyses were performed using an electronic spreadsheet program.

Results

The overall ranking of the top 20 US dermatology residency programs in 2014 is presented in Table 1. The top 5 programs based on each of the 3 factors most reflective of academic achievement used in the weighted ranking algorithm are presented in Tables 2 through 4.

Comment

The ranking of US residency programs involves using data in an unbiased manner while also accounting for

TABLE 1. Overall Ranking of the Top 20 US Dermatology Residency Programs in 2014

Ranking	Institution (Location)
1	Harvard University (Boston, Massachusetts)
2	University of California, San Francisco (San Francisco, California)
3	Stanford University (Stanford, California)
4	University of Pennsylvania (Philadelphia, Pennsylvania)
5	Emory University (Atlanta, Georgia)
6	Northwestern University (Chicago, Illinois)
7	University of California, Los Angeles (Los Angeles, California)
8	University of Miami (Miami, Florida)
9	Mayo Clinic (Rochester, Minnesota)
10	Case Western Reserve University (Cleveland, Ohio)
11	University of California, San Diego (San Diego, California)
12	Yale University (New Haven, Connecticut)
13	Weill Cornell Medical College (New York, New York)
14	Wake Forest University (Winston-Salem, North Carolina)
15	Icahn School of Medicine at Mount Sinai (New York, New York)
16	New York University (New York, New York)
17	Henry Ford Hospital (Detroit, Michigan)
18	University of Michigan (Ann Arbor, Michigan)
19	University of California, Davis (Davis, California)
20	University of Texas Southwestern (Dallas, Texas)

TABLE 2. Top 5 US Dermatology Residency Programs Based on Amount of National Institutes of Health Funding Received in 2014

Ranking	Institution (Location)
1	Emory University (Atlanta, Georgia)
2	Stanford University (Stanford, California)
3	Harvard University (Boston, Massachusetts)
4	University of California, San Francisco (San Francisco, California)
5	University of California, Los Angeles (Los Angeles, California)

TABLE 3. Top 5 US Dermatology Residency Programs Based on No. of Faculty Publications in 2014

Ranking	Institution (Location)
1	University of California, San Francisco (San Francisco, California)
2	University of Pennsylvania (Philadelphia, Pennsylvania)
3	Harvard University (Boston, Massachusetts)
4	Northwestern University (Chicago, Illinois)
5	University of Miami (Miami, Florida)

TABLE 4. Top 5 US Dermatology Residency Programs Based on No. of Faculty Lectures at National Society Meetings in 2014[a]

Ranking	Institution (Location)
1	Harvard University (Boston, Massachusetts)
2	University of California, San Francisco (San Francisco, California)
3	Northwestern University (Chicago, Illinois)
4[b]	Henry Ford Hospital (Detroit, Michigan)
4[b]	Mayo Clinic (Rochester, Minnesota)
5	Case Western Reserve University (Cleveland, Ohio)

[a]Annual meetings of the American Academy of Dermatology, the Society for Investigative Dermatology, the American Society of Dermatopathology, the Society for Pediatric Dermatology, and the American Society for Dermatologic Surgery.
[b]Henry Ford Hospital and Mayo Clinic had the same number of faculty lectures at national society meetings in 2014.

important subjective measures. In a 2015 survey of residency applicants (n=6285), the 5 most important factors for applicants in selecting a program were the program's ability to prepare residents for future training or position, resident esprit de corps, faculty availability and involvement in teaching, depth and breadth of faculty, and variety of patients and clinical resources.[3] However, these subjective measures are difficult to quantify in a standardized fashion. In its ranking of residency programs, the Doximity Residency Navigator utilizes surveys of current residents and recent alumni as well as nominations from board-certified Doximity members.[1]

One of the main issues in utilizing survey data to rank residency programs is the inherent bias that most residents and alumni possess toward their own program. Moreover, the question arises whether most residents, faculty members, or recent alumni of residency programs have sufficient knowledge of other programs to rank them in a well-informed manner.

Wu et al[4] used data from 2004 to perform the first algorithmic ranking of US dermatology programs, which was based on publications in 2001 to 2004, the amount of NIH funding in 2004, DF grants in 2001 to 2004, faculty lectures delivered at national conferences in 2004, and number of full-time faculty members on the editorial boards of the top 3 US dermatology journals and the top 4 subspecialty journals. Aquino et al[2] provided updated rankings that utilized a weighted algorithm to collect data from 2008 related to a number of factors, including annual amount of NIH and DF funding received, number of publications by full-time faculty members, number of faculty lectures given at 5 annual society meetings, and number of full-time faculty members who were on the editorial boards of 6 dermatology journals with the highest impact factors. The top 5 ranked programs based on the 2008 data were the University of California, San Francisco (San Francisco, California); Northwestern University (Chicago, Illinois); University of Pennsylvania (Philadelphia, Pennsylvania); Yale University (New Haven, Connecticut); and Stanford University (Stanford, California).[2]

The current ranking algorithm is more indicative of a residency program's commitment to research and scholarship, with an assumption that successful clinical training is offered. Leading researchers in the field also are usually known to be clinical experts, but the current data does not take into account the frequency, quality, or methodology of

teaching provided to residents. Perhaps the most objective measure reflecting the quality of resident education would be American Board of Dermatology examination scores, but these data are not publically available. Additional factors such as the percentage of residents who received fellowship positions; diversity of the patient population; and number and extent of surgical, cosmetic, or laser procedures performed also are not readily available. Doximity provides board pass rates for each residency program, but these data are self-reported and are not taken into account in their rankings.[1]

The current study aimed to utilize publicly available data to rank US dermatology residency programs based on objective measures of academic achievement. A recent study showed that 531 of 793 applicants (67%) to emergency medicine residency programs were aware of the Doximity residency rankings. One-quarter of these applicants made changes to their rank list based on this data, demonstrating that residency rankings may impact applicant decision-making.[5] In the future, the most accurate and unbiased rankings may be performed if each residency program joins a cooperative effort to provide more objective data about the training they provide and utilizes a standardized survey system for current residents and recent graduates to evaluate important subjective measures.

Conclusion

Based on our weighted ranking algorithm, the top 5 dermatology residency programs in 2014 were Harvard University (Boston, Massachusetts); University of California, San Francisco (San Francisco, California); Stanford University (Stanford, California); University of Pennsylvania (Philadelphia, Pennsylvania); and Emory University (Atlanta, Georgia).

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