



ORIGINAL RESEARCH

Is it Time for Wilderness Medicine Fellowships to Join the National Resident Matching Program Specialties Matching Service?

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Introduction—The national resident matching program specialties matching service (SMS) fills fellowship positions for 66 subspecialties. Wilderness medicine (WM) fellowships currently do not participate in SMS; instead, WM uses an offer date to fill positions. To be successful, at least 75% of the available positions within a subspecialty must be within the SMS match.

Methods—All 13 civilian WM fellowship directors recruiting for academic year (AY) 2019 to 2020 and WM fellowship alumni were surveyed regarding future participation in the SMS. Estimation of the performance of SMS for WM was calculated using data published by the national resident matching program.

Results—Fellowship directors from all 13 civilian WM fellowships and 60 fellowship alumni participated in the survey. SMS was supported by 62% (n=8) of fellowship directors and 55% (n=33) of fellows. Willingness to pay SMS fees was 54% (n=7) among fellowship directors and 60% (n=36) among fellows. Of matched applicants, 85% (n=51) obtained their top choice program. SMS, if implemented, was perceived to have no impact on matching a top choice program by 53% (n=31); however, 34% (n=20) believed SMS would improve the chance of an applicant matching higher. The match success of SMS for specialties with fewer than 30 programs is 74%. Of the 20 WM fellowship positions in AY 2019 to 2020, 16 were matched, for a success rate of 80%.

Conclusions—There is insufficient support (<75%) at this time to institute an SMS match for WM. The offer date performed similarly to SMS for filling fellowship positions in AY 2019 to 2020.

Keywords: graduate medical education, matching algorithms, emergency medicine/education, family medicine/education, surveys and questionnaires, United States

Introduction

Fellowships participating in the national resident matching program (NRMP) specialties matching service (SMS) in 2018 included 66 subspecialties.¹ According to a 2018 press release from NRMP president and chief executive officer Mona M. Signer, interest and participation in subspecialty training continues to grow, with a 16% increase in the number of applicants seeking fellowship positions through SMS since 2014.² For SMS to be successful, at least 75% of the available positions within a specialty

must be within SMS.³ Wilderness medicine (WM) fellowships do not currently participate in NRMP's SMS.

WM fellowships were started in 2003; there are now 18 active civilian WM fellowship programs and 1 military program. Since the inception of WM fellowships, only 2 programs have ceased to offer WM fellowship positions; 1 program transitioned to an exclusive international focus, and 1 lost the program director via promotion to a healthcare leadership role without an available replacement. All WM fellowship programs, current and retired, are listed in [Table 1](#).

Civilian WM fellowships currently fill positions using an agreed upon offer date set by a consensus among all fellowship directors. The US Army has a WM fellowship that is only available to active duty military personnel; this military position is applied to and matched separately. The

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Table 1. Wilderness medicine fellowship programs at time of survey (n=19), ranked chronologically from year of formation

<i>Fellowship program name</i>	<i>Year started</i>	<i>Candidates accepted</i>	<i>Survey participation</i>
Stanford University	2003	Emergency medicine (4-y residency/3-y residency + 1-y postgraduate experience)	Yes
Harvard University	2005	Emergency medicine	Yes
University of Utah	2007	Emergency medicine Non-EM specialties (self-funded)	Yes
University of California San Francisco Fresno	2008	Emergency medicine Family medicine	Yes
Madigan Army Medical Center	2010	Emergency medicine (active duty only) Family medicine (active duty only)	No, military match
State University of New York Upstate Medical University ^a	2011–2018	Emergency medicine	No, retired program
Medical College of Georgia Augusta University	2011	Emergency medicine Family medicine Internal medicine Nurse practitioner/Physician assistant Non-EM specialties (self-funded)	Yes
University of Colorado	2011	Emergency medicine Non-EM specialties (self-funded)	Yes
Baystate—University of Massachusetts	2012	Emergency medicine	Yes
George Washington University	2012	Emergency medicine International emergency medicine	Yes
University of California San Diego	2013	Emergency medicine	Yes
Eastern Virginia Medical School ^a	2013–2016	Emergency medicine	No, international medicine only
University of New Mexico	2014	Emergency medicine	Yes
Virginia Tech Carilion Clinic	2016	Emergency medicine Family medicine Nurse practitioner/Physician assistant	Yes
Yale University	2016	Emergency medicine	Yes
University of California Irvine	2018	Emergency medicine (4-y residency/3-y residency + 1-y postgraduate experience)	Yes
University of California Los Angeles	2018	Emergency medicine	No, not active at time of survey
Wake Forest	2018	Emergency medicine	No, not active at time of survey
Dartmouth	2019	Emergency medicine	No, not active at time of survey
Oregon Health Sciences University	2019	Emergency medicine	No, not active at time of survey
University of Nevada, Reno	2019	Family medicine	No, not active at time of survey

^aRetired program.

civilian offer date has been set as 0900 Pacific Standard Time/1200 Eastern Standard Time on November 1 for the last several years. At this time, program directors call their first-choice applicant(s) and continue until all available positions are filled. In 2018, an internal shared document, updated with names of matched applicants by program directors in real time, streamlined the process. Occasionally, there are concerns that fellowship directors may

make verbal nonbinding agreements with, or offers to, candidates before the offer date. These concerns are difficult to substantiate, erode confidence in the fidelity of the current offer date system, and may put the applicant and/or other fellowship programs at a disadvantage if early unsolicited offers are indeed occurring.

Positions were initially offered exclusively to board certified/board eligible (BC/BE) graduates of an emergency

medicine residency. Some fellowship programs now include positions for BC/BE family medicine and internal medicine residency graduates, other specialty BC/BE graduates who are self-funded, and nurse practitioner/physician assistant positions. Anecdotally, most WM fellowship programs have seen a rise in the number of applicants pursuing a fellowship position and fewer internal matches. Competitiveness for postgraduate fellowship training in WM appears to be increasing, aligning with trends documented by NRMP for fellowship specialties participating in SMS.⁴

This investigation attempts to determine the level of interest among WM fellowship program directors and the opinions of previously matched fellows regarding future utilization of SMS for WM fellowship positions.

Methods

At the time of the study, all current WM fellowship directors were members of the American College of Emergency Physicians (ACEP) wilderness medicine section's fellowship director's subcommittee. WM fellowship directors were sent an online survey in advance of the annual WM fellowship directors subcommittee meeting at ACEP's Scientific Assembly using ACEP's WM section fellowship director's contact email list. The survey was open from May 31 to September 12, 2018. Questions on the survey are in [Appendix 1](#) (see online [Appendix](#)); these included fellowship program name (optional free text), support for SMS and affiliated costs (queried with yes/no responses), whether directors saw themselves continuing in the role for the next few years, and a section for comments. Survey results were pooled and deidentified for analysis.

WM fellowship alumni and current fellows graduating in summer 2019 were sent an online survey using the Wilderness Medical Society's graduate medical education fellows contact email list of past and present fellows. The survey was open from November 4 to December 3, 2018. Questions on the survey are in [Appendix 2](#) (see online [Appendix](#)); these included year of fellowship graduation (free text), support for SMS and affiliated costs (queried with yes/no/unsure responses), perception of the impact of SMS on match success, their match success (top, second, third, or fourth or lower choice program), top reason to rank a program highly, and whether they were satisfied overall with their fellowship experience. Survey results were pooled and deidentified for analysis.

The performance of SMS for WM was estimated using data published by the NRMP. The overall 2019 to 2020 match rate and the match rate for specialties with fewer than 30 programs participating in 2019 to 2020 were pulled from the NRMP website.⁴ These were compared to the match rate of positions for the 2019 to 2020 fellowship year match in WM using the current offer date method.

Available positions in the WM offer date were calculated by using the number of open positions on the program director's shared document before the commencement of offers on November 1.

Institutional review board approval was obtained through the University of California San Francisco Fresno medical education program. Data were exported from Qualtrics survey software into SPSS and stripped of respondent identifiers. All data were summarized using descriptive statistics.

Results

FELLOWSHIP DIRECTOR SURVEY

All 13 civilian programs that were active at the time of the survey responded for a fellowship director response rate of 100%. The only programs that did not respond were either retired WM fellowships (the Eastern Virginia Medical School international and wilderness fellowship and the State University of New York Upstate Medical University wilderness and expedition medicine fellowship) or a military program (Madigan Army Medical Center austere and wilderness medicine) not affected by changes to the civilian process of matching applicants. Of note, there are now 5 programs that were not yet active at the time of the survey ([Table 1](#)).

The majority (62%) of fellowship directors believed a formal match process would benefit both the programs and the applicants (n=8). The remainder of directors (38%) thought a change from the current offer date was not needed (n=5). Willingness to pay for the associated fees of SMS was more evenly split with 54% willing to pay (n=7) and 46% not willing to pay associated program fees (n=6). Free comments were entered by 8 respondents (62%), half in support and half against a change in the current offer date ([Table 2](#)).

FELLOWS SURVEY

Of the 112 contacts on the Wilderness Medical Society's graduate medical education fellows list, 60 responded (54%). The majority of fellow respondents graduated in the past 5 y, with no fellows before 2009 responding to the survey ([Figure 1](#)). Their responses are similar to the fellowship director results, with 55% supporting a match (n=33), 32% not in support (n=19), and 13% neutral (n=8) about a match process; 60% agreed they would have been willing to pay associated fees (n=36), 22% would not have been willing to pay (n=13), and 18% (n=11) were unsure. These are represented side by side ([Table 2](#)), and the means are not significantly different ($P=0.5$) between directors and fellow responses.

Fifty-three percent of fellows believed participation in an SMS match would have had no impact on the chance

Table 2. Responses compared by respondent type

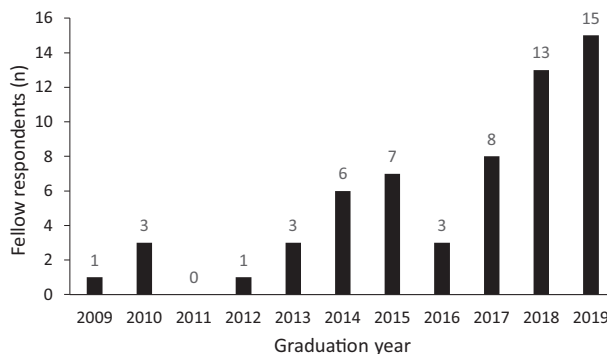
Respondent type	Support a match service, %	Willing to pay match fees, %
Fellowship program directors (n=13)	62	54
Fellows graduating 2009–2019 (n=60)	55	60

of matching with their top-choice program (n=31), with 34% believing SMS would improve the match process in the applicants' favor (n=20); only 14% believed SMS would decrease applicant success (n=8) compared to the current offer system (Table 3). The actual success of fellows obtaining a top-choice program appears to have decreased over time, but this may be related to sampling bias (Figure 2). The prime reasons for a program to be highly desired by successful applicants included perceived match with program or "fit" (68%), location (18%), program reputation (8%), and competitiveness for internal hire after completing the program (5%). In retrospect, 88% were extremely or very satisfied with their match outcome, with 10% slightly satisfied/dissatisfied or neutral and only 2% (n=1) very dissatisfied.

NRMP SMS DATA

The 2019 appointment year was the largest in the history of the SMS, encompassing 4750 programs in 66 subspecialties offering 10,936 fellowship positions; of those, 9378 (86%) were filled.⁴ Of the 66 participating subspecialties, 32 filled >90% and 20 filled <75% of the positions offered.⁴ The NRMP classifies SMS applicants into 6 types of graduates: US allopathic medical schools (US MDs), Canadian medical schools, osteopathic medical schools, fifth pathway programs, US citizen graduates of international medical schools, and non-US citizen graduates of international medical schools. NRMP reports include the number of positions filled by US MDs, in addition to positions filled by all applicants, which would include US DO medical school graduates and all international graduates. Only eight of the 66 subspecialties filled >75% positions with US MDs, and 28 subspecialties filled <50% of their positions with US MDs.⁴

When selecting out subspecialties with 30 or fewer programs participating in SMS, similar to the expected number of programs participating in matching to WM programs for the next 5 to 10 y, 15 subspecialties were available for match performance comparison (Table 4). The success of SMS match for 30 or fewer programs in a subspecialty drops the overall SMS success of 86 to 74% for small subspecialties. By comparison, the success of emergency

**Figure 1.** Graduation year from fellowship of fellow respondents.

medicine positions filled by the WM offer date for 2019 was 80%. These positions were all filled by US MDs.

Discussion

The main finding of the study is that the majority (62%) of fellowship directors recruiting in academic year (AY) 2019 to 2020 supported joining SMS, but this did not reach the level required (75%) for a successful match outcome using SMS. The majority (68%) of successful WM applicants support or were neutral about participation in SMS. The WM offer date filled positions as successfully as SMS for smaller subspecialties for AY 2019 to 2020. The frequency of successful applicants obtaining a first-choice program appears to be decreasing, and not all WM fellowship program spots were filled. Free-text comments by fellowship directors who do not currently favor SMS participation suggest that a centralized matching process may be necessary as the number of WM fellowship programs continue to rise.

If WM were to join SMS, would the needs of the subspecialty be met? Most subspecialties joining SMS have remained as participants, and participants continue to grow in number. The collapse of a well-functioning match has occurred—for gastroenterology (1986–1999; rejoined in 2006) and infectious disease (1986–1990; rejoined in 1994)—due to shifts in the job market.^{5,6} During the non-SMS years, these fellowship searches became more local and less national, recruitment occurred earlier, and applicants reported being pressured into early acceptance of positions.⁷ Nephrology joined SMS in 2009 with initial success and satisfaction, but the number of positions offered outside the match has grown to the point that continuation of SMS is threatened.⁸ Radiology fellowships joined SMS in 2003 with the caveat that internal positions be offered before the SMS match; fellowship directors were nearly unanimous in support, and applicants had mixed perceptions.^{9,10} Emerging fields such as minimally invasive gynecological surgery noted an increase in the

Table 3. Fellow respondents’ expressed belief on the impact of a match in getting into a top choice program

<i>Fellowship graduation year</i>	<i>Respondents believing a match would make getting into a top-choice program more likely, % (n)</i>	<i>Respondents believing a match would make getting into a top-choice program less likely, % (n)</i>	<i>Respondents believing a match would have no impact on getting into a top choice program, % (n)</i>
2009	—	—	100 (1)
2010	66 (2)	—	33 (1)
2012	100 (1)	—	—
2013	—	—	100 (2)
2014	20 (1)	—	80 (4)
2015	43 (3)	—	57 (4)
2016	66 (2)	—	33 (1)
2017	25 (2)	25 (2)	50 (4)
2018	31 (4)	8 (1)	62 (8)
2019	33 (5)	13 (2)	53 (8)
2020	100 (1)	—	—

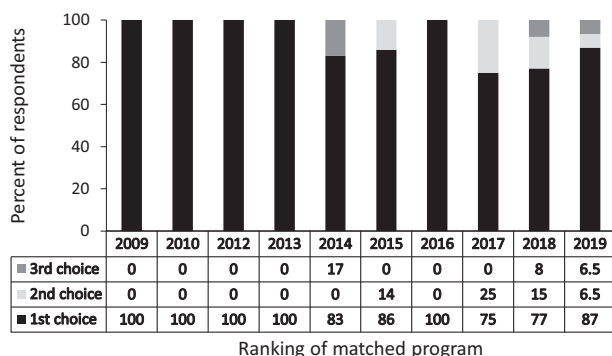


Figure 2. Fellows match success by graduation year. There were no survey respondents for the year 2011.

number of offered positions and qualified applicants since joining the SMS in 2014.¹¹ The “market” for WM fellowships has increased, as indicated by the growing number of programs. Communication will become more challenging as the number of fellowship programs grows, especially when attempting to coordinate an informal offer date process.

Despite its familiarity, NRMP’s SMS is not the only pathway to a centralized match for fellowships. Other businesses, the military, and even professional societies host matching services. The SF match currently provides fellowship matching services to 22 subspecialties.¹² National Matching Services, Inc., provides matching services in medicine but does not currently host a fellowship match.¹³ The military does not use a computer-generated match list; the selection committee discusses and negotiates between specialties, programs, faculty, and applicants. Unlike other

matching services, in the military match applicants can be placed in a program they did not rank in their rank list.¹⁴ The American Urological Association, in conjunction with the Society of Academic Urologists, has overseen the urology residency match program for more than 35 y, which includes fellowship matches.¹⁵ The benefits to a specialty society taking on a centralized match for the field are a presumed increase in engaged society members both pre- and post-match and retention of members who will be future leaders in the field.

Barriers to successful implementation of a centralized match for WM include costs, finding a way to accommodate the diversity of applicant types, and ensuring participation of all WM fellowship programs. Participation cost does pose a theoretical barrier; match services would need to be perceived as a value over the current offer date system to be accepted by program directors. Only 54% of fellowship directors stated a willingness to pay the fees associated with SMS. If a centralized match representing 75% of all available positions were implemented, the 22% of applicants not willing to pay match-associated fees would not likely secure a position outside of an established match. WM fellowship positions accommodate physicians of many specialty backgrounds, and not all programs accept the same set of applicant types (Table 1). NP/PA positions are also offered for some WM fellowships. At the time of publication, the SMS does not accommodate nonphysician matching.

In final consideration of what is best for the future of filling WM fellowship positions, it would be helpful to look at trends in the field’s growth and the dynamic nature of opinions of fellowship directors on a centralized process. Since the survey was released for AY 2019 to 2020, an additional offer date on November 1, 2019 for AY 2020

Table 4. Comparison of subspecialties with <30 programs from NRMP SMS match and current WM offer date system and overall SMS match

<i>Specialty</i>	<i>US MD</i>	<i>All app</i>	<i>Positions offered (n)</i>	<i>Programs (n)</i>	<i>US MD match (n)</i>	<i>All app match (n)</i>	<i>US MD fill (%)</i>	<i>All app fill (%)</i>	<i>Unfilled program (n)</i>
EM-Tox	31	41	54	28	28	36	52	67	14
IM-Adult CHD	4	6	9	9	4	5	44	56	4
IM-Heme	70	77	14	3	13	14	92	100	0
IM-Onc	3	60	10	5	0	10	0	100	0
IM-Pulm	8	113	27	14	1	27	4	100	0
Laryngol	12	18	26	24	12	16	46	62	10
GYN-Peds/Adol	11	17	11	10	8	10	73	91	1
Peds-Academic	7	10	16	15	6	8	38	50	8
Peds-Adol	25	32	36	24	21	27	58	75	7
Peds-Abuse	14	17	20	19	10	13	50	65	7
Peds-Rheum	14	22	39	30	14	19	36	49	15
Peds-Sports	59	97	25	18	15	25	60	100	0
PMR-CHI	10	19	22	21	9	17	41	77	5
PMR-Ped	15	22	20	18	14	20	70	100	0
PMR-SCI	10	20	30	21	10	19	33	63	8
SMS<30 programs	293	571	359	259	165	266	46	74	79
2019 WM offer date	N/A	N/A	20	13	16	16	80	80	4
Total 2019 SMS match	6000	12,000	11,000	4750	5630	9378	52	86	1084

Abbreviations: US MD, applicants who are graduates of a medical school in the United States; all app, all applicants including graduates of a foreign medical school; US MD match, number of positions filled by graduates of a medical school in the United States; all app match, number of positions filled by all applicants including graduates of a foreign medical school. EM-Tox, emergency medicine-toxicology; IM-Adult CHD, internal medicine-adult congenital heart disease; IM-Heme, internal medicine-hematology; IM-Onc, internal medicine-oncology; IM-Pulm, internal medicine-pulmonary disease and pulmonary/critical care medicine; Laryngol, laryngology; GYN-Peds/Adol, pediatric and adolescent gynecology; Peds-Academic, academic general pediatrics; Peds-Adol, adolescent medicine; Peds-Abuse, pediatrics-child abuse; Peds-Rheum, pediatrics-rheumatology; Peds-Sports, pediatrics-sports medicine; PMR-CHI, physical medicine and rehabilitation-brain injury medicine; PMR-Ped, physical medicine and rehabilitation-pediatrics; PMR-SCI, physical medicine and rehabilitation-spinal cord injury; SMS, specialties matching service pooled results for specialties with <30 fellowship programs within the specialty; 2019 WM offer date, 2019 Wilderness Medicine offer date; total 2019 SMS match, total 2019 specialties matching service match.

to 2021 has occurred, 5 more programs offer WM fellowship positions, and there has been an additional survey of fellowship directors on support for a centralized match process (not specifically the SMS) in lieu of the current offer date. The success of the AY 2020 to 2021 offer date can be calculated by the number of filled physician positions; of 21 available positions, 15 were filled (71%), with 4 of those 15 offers (27%) occurring outside of the WM offer date (internal applicants). For the first time, in AY 2020 to 2021, the total number of interviewed external applicants was known (24 applicants), leaving less than even odds (46%) of securing 1 of the 11 matched positions and an 88% chance of matching in any position if all programs were applied to (21 of 24). However, not all open positions are available for a single applicant; some are exclusively NP/PA positions, family medicine physician positions, or emergency medicine physician positions. A follow-up survey for civilian WM fellowship directors was sent out after the offer date for AY 2020 to 2021 with a slightly different

question: “Are you open to using an internally hosted match process for wilderness medicine in 2020?” The response rate was 89% (16 of 18 program fellowship directors) with 88% open to this change and only 2 (13%) “no” responses.

LIMITATIONS

This study is limited by survey methodology and the lack of complete data availability to directly compare the current offer date process to the SMS owing to the unknown number of total applicants in the WM offer date system. The total number of applicants, matched and unmatched, to WM fellowships is unknown with the de-centralized offer date system. Opinions of applicants who did not match, or who may have matched but ultimately did not complete a fellowship program, would not be accounted for in this data.

The sample size of this study is very small (n=13 fellowships and n=60 fellowship alumni). Although this would normally be a significant limitation to generalizing findings

to the population the study was meant to represent, that is not the case with this investigation because all of the fellowship program directors whose programs would be affected by a change to the offer system were sampled with a response rate of 100%, and more than half of all fellowship alumni responded, which means these results can be considered a definitive measure of opinion at the moment in time in which the questions were posed.

Lastly, and most importantly, these data are limited by the dynamic nature of attitudes and opinions regarding the best course of action. The nearly split sentiment regarding WM joining SMS for AY 2019 to 2020 appears to no longer be the collective sentiment of fellowship directors for AY 2020 to 2021. Although the question about using a centralized matching service is subtly different from the question about specifically joining the SMS, there is a clear shift toward considering a more standardized, impartial process in lieu of the current telephone-based offer date. These data are a snapshot of a moving picture and therefore cannot predict future attitudes toward a centralized match for WM fellowship positions.

Conclusions

There is majority support for WM joining the SMS, but less than the 75% threshold required to participate. The current offer date filled available WM fellowship positions at approximately the same success rate as the SMS for subspecialties with fewer than 30 participating programs for AY 2019 to 2020. There are many barriers to implementing an SMS match for WM. WM fellowships have increased in number since AY 2019 to 2020, and success of the WM offer date for AY 2020 to 2021 for external applicants was 52%. A centralized match process is being viewed more favorably by nearly 90% of current fellowship program directors; regardless, SMS is likely not the best solution for filling WM fellowship positions. Alternatives to the current offer date should continue to be investigated by WM fellowship directors as stewards for developing the next generation of subspecialty leaders.

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Supplementary data

Supplementary material associated with this article can be found in the online version at <https://doi.org/10.1016/j.wem.2020.07.008>.

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