

Family Medicine Specialty Selection: A Proposed Research Agenda

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Background and Objectives: *Our objectives were to provide an update on the status of selection by medical students of family medicine as a specialty, to summarize what is known about influences on this specialty choice, and to propose a research agenda for the future. **Methods:** Data from the National Resident Matching Program and the American Academy of Family Physicians residency database were obtained. Past reviews of research on family medicine specialty selection were summarized, and recent research was reviewed. Gaps in the knowledge base and common research design weaknesses were listed. **Results:** As a result of our analysis, a set of 12 research questions are posed and a set of 11 study design recommendations made. **Conclusions:** Family medicine specialty choice research must be planned and conducted with the most robust methodology possible, building on past research, to produce results that can assist in formulating effective policy.*

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The past decade has seen a marked decline in the selection of family medicine as a specialty by US allopathic medical school graduates. Figure 1 illustrates trends in the National Resident Matching Program (NRMP) since 1980. The number of first-year family medicine positions increased each year, except 1990, until peaking in 1998 at 3,293 and then declined every year through 2006. The proportion of US graduates in the NRMP choosing family medicine has trended steadily down except for the 1993–1997 period and now is the lowest on record.

The number of first-year family medicine positions filled by US allopathic graduates has trended up and down, with a trend downward from 1980 to 1993, a significant

trend upward from 1993 to a high level of 2,340 in 1997, and a steady decline since to the lowest level ever in 2005 and then a slight increase in 2006. The proportion of first-year positions filled in the NRMP by all applicants during the past decade also declined but not to the extent that occurred in the late 1980s. The fill rate has increased the past few years as programs have been more willing to accept osteopathic and international medical graduates than in the earlier period (Table 1).

In spite of these NRMP statistics, the proportion of available first-year positions filled by July 1 has remained well above 90%. However, as the number of positions filled by non-US allopathic graduates has increased, the number of first-year positions filled outside the NRMP has increased, leading to a declining number and proportion of first-year positions offered in the NRMP, from 90% in 1995 to slightly above 80% in 2006.

These trends raise a number of research questions important for the future of the specialty. This article's purpose is to describe what we currently know about the selection of family medicine by US medical students, to propose a research agenda for the immediate future, and to describe how to improve the quality of research in the field. The ultimate goal is to stimulate high-quality research that can be used for policy formulation so that family medicine remains the foundation of primary care in the nation's health care system.

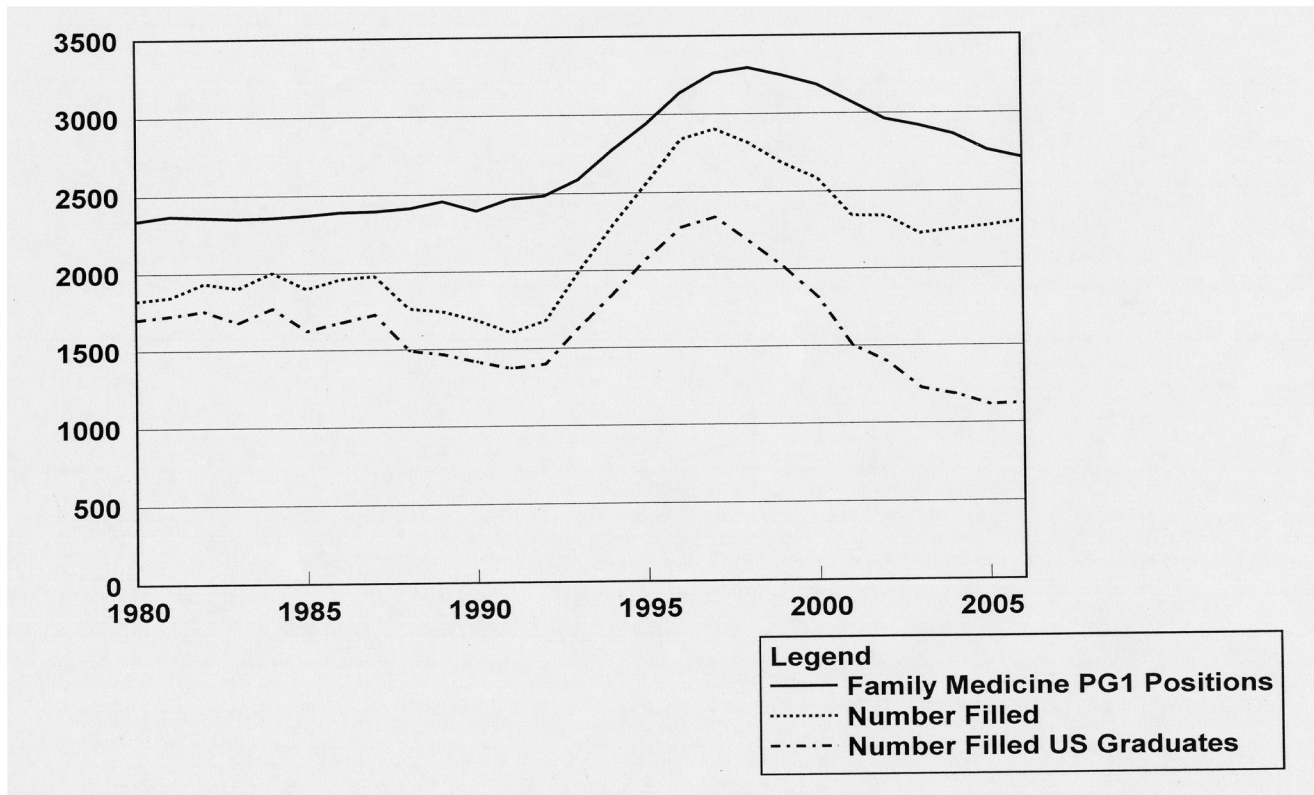
What Is Known About Family Medicine as a Specialty Choice

There have been four reviews of the family medicine specialty choice literature since 1995, the last one published in 2003.¹⁻⁴ The variables that have been found consistently to be associated with the choice of family medicine as a specialty include age (older students are more likely to choose family

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Figure 1

Number of First-year Family Medicine Positions Offered in the NRMP, Number of Positions Filled, and Number Filled by US Graduates



NRMP—National Resident Matching Program

Table 1

First-year Residents in Family Medicine Programs

	1985	1990	1995	2000	2005
	# (%)	# (%)	# (%)	# (%)	# (%)
Osteopathic graduates	NA	174 (7.3)	258 (7.9)	378 (10.9)	520 (15.8)
International medical graduates (IMGs)	381 (15.1)	433 (18.1)	463 (14.2)	789 (22.7)	1,299 (39.6)
US citizen IMG	264 (10.4)	200 (8.4)	190 (5.8)	438 (12.6)	601 (18.3)
Non-US citizen IMG	117 (4.6)	233 (9.8)	273 (8.4)	351 (10.1)	698 (21.3)
Canadian graduates	18 (0.7)	7 (0.3)	10 (0.3)	15 (0.4)	10 (0.3)

medicine), Hispanic ethnicity, rural background, lower income expectations, a preference for family medicine at matriculation, attending a public school, participating in a special program aimed at producing family physicians, experiencing required training in family medicine in the third or fourth year, and an intent to practice in a rural area. These results have been obtained almost exclusively from observational studies. Only one variable (initiation of a required third-year clerkship) has been studied prospectively compared to a control group.⁵

Another set of variables commonly believed to affect the choice of family medicine have either been found consistently not related or have been associated with mixed results. These include student gender and marital status, student debt, family medicine curriculum and faculty participation in the first 2 years of medical school, and

the composition of the admissions committee.

The Arizona Study, sponsored by the American Academy of Family Physicians (AAFP) and named after the home institution of the study team, was conducted in 2001–2002 and included 24 schools. It found three factors significantly associated with increases in choice of family medicine in multivariate analyses: proportion of students entering rural practice, the number of required rotations in family medicine and primary care, and students' perception of the clinical competence of family medicine faculty.⁶ Another finding of importance was that students interested in research were highly unlikely to choose family medicine.⁷

A Suggested Research Agenda

A number of important questions about students' specialty selections and family medicine remain unanswered. Table 2 shows the questions

we feel have the greatest potential to contribute to workforce policy and to strengthening the specialty of family medicine.

More and Improved Research Is Needed on Specialty Selection

We encourage family medicine workforce researchers to address this list of research questions. As with any other field of inquiry, the field of family medicine specialty choice research would, ideally, expand and improve with time. New studies should build upon previous ones by attempting to reproduce results, improving on study designs, and contributing to a robust and usable body of knowledge. When we compared specialty choice research at two points in time, 1995 and 2003, using a set of quality criteria, we found only a slight improvement in quality scores, and many studies were of such low quality that they were not usable in a literature review.⁴ Consequently, we offer the

Table 2

Research Questions Regarding Choice of Family Medicine as a Specialty

Question #1—What will be the effect of decreasing federal funds for family medicine training (Title VII) on family medicine departments, residency programs, and medical students' career choices?

Question #2—What strategies are developed by family medicine training programs to compensate for the loss of Title VII funds, and what effect will they have on student specialty selection?

Questions #3—As medical school family medicine departments develop research programs and research faculty, what will be the effects on medical student career choices?

Question #4—Even though, to date, medical student debt levels have not been a major contributor to specialty selection, as debt levels continue to increase, will there be a threshold level of debt that does discourage students from choosing family medicine?

Question #5—Is there a cohort of family medicine-inclined students who do not apply for medical school because of the specter of large debt loads?

Question #6—What will be the effect, if any, of the new model of family medicine on medical students' perceptions of the specialty and on their specialty choices?

Question #7—Will 4-year family medicine residency programs attract students into the specialty who otherwise would not have chosen this specialty?

Question #8—Will graduates of experimental 4-year residency programs produce better patient outcomes and be more satisfied in practice than graduates of 3-year programs?

Question #9—What are the effects of outside market forces on the medical student specialty choices and perceptions of family medicine?

Question #10—Will the trend toward filling more family medicine residency positions outside the National Resident Matching Program continue, and what effects will that trend have on programs?

Question #11—What is and will be the experience of family medicine residencies with osteopathic and international medical graduates?

- What are their residency graduation rates?
- Do they require remediation?
- What is their rate of practicing primary care?
- Will they locate practices in rural and urban underserved areas at the same rates as other graduates?

Question #12—What happened to the medical students who selected family medicine in record numbers between 1993 and 1998?

- Have they been happy with their specialty choice?
- How many have changed to other specialties?

Table 3
Recommendations

<i>Suggestion</i>	<i>Discussion of the Concept</i>	<i>Example</i>
Build on previous research.	The best research is designed to explore new hypotheses that are suggested by what is already known in a given field of inquiry or are developed from a model describing the interrelationships among key variables. Useful research may also improve prior methodology and confirm previous findings. Any of these outcomes requires that the investigator be familiar with what has already been published. Existing reviews of the literature are always a good starting place.	References 1–4 offer reviews of the literature up to the point of their publication.
Develop a hypothesis or hypothetical model.	It is helpful to develop or use a model describing the expected relationships among the variables that are known or hypothesized to be relevant to the field of study. This model can suggest both the appropriate study design and the hypotheses for the research. As relationships are proven or disproved, the model can be adjusted.	In the field of specialty choice, two slightly different hypothetical models are found in articles by Bland et al ¹ and Senf et al. ⁸
Use high-quality study designs.	Quantitative study designs are commonly categorized into (1) randomized controlled trials, (2) controlled trials without randomization, (3) cohort or case-control observational studies, (4) time series (longitudinal data), (5) cross-sectional studies, and (6) descriptive or case studies. Randomization is rarely possible in educational research, introducing the possibility of self-selection bias, as for example when elective or selective educational experiences are analyzed in relation to specialty choice. In general, the study design should be the best that is feasible given monetary and other constraints. Indicators of quality include multiple classes, multiple schools, following students over multiple years.	Additional criteria for scoring research can be found in Campos-Outcalt et al ³ and Bland et al. ¹ See Rabinowitz et al ⁹ for an example of a longitudinal database at one school and references 3,5,6,10,11 for examples of studies using data from multiple schools.
Understand what available data sources contain and their limitations.	It is critical to understand the limitations of any preexisting data set. As an example, the National Resident Matching Program (NRMP) data contain only the residency positions offered and filled in the NRMP. Residency programs in some specialties offer and fill more of their positions outside the Match than does family medicine. NRMP data do not provide an accurate picture for comparison.	American Academy of Family Physicians surveys of family medicine residencies list all residents, including those who sign contracts outside the NRMP. See, for instance, Pugno et al. ¹²
Use validated measurement tools when possible.	The literature search may reveal validated tools available for use. If none exist, there may be unvalidated tools that have been used in other studies that will still allow comparisons to data from the new study. If a tool is to be developed, a standard methodological text should be consulted. In general, actual behavior is a better measure than stated intentions, and stated intentions are better than an explanation of the reason for behavior. The effect of debt on specialty choice is one topic where stated influences often differs from actual behavior.	The Association of American Medical Colleges pre-matriculation and graduation questionnaires are validated tools available for research. See reference 11 for a study using the graduation questionnaire. A useful social science text for designing measurement tools is <i>The Practice of Social Research</i> . ¹³ See an article by Pathman ¹⁴ for a discussion of the problems associated with stated motivations and intent.
Study family medicine separately from other primary care specialties.	Students who choose family medicine differ from those who enter primary care internal medicine and pediatrics. These specialties differ in many ways. Combining them can hide significant results.	See references 15 and 16 for a further discussion of this issue.
Move beyond descriptive statistics.	In general, the more complex the analysis, the more convincing the results. To add to the body of research in specialty choice, analysis should be more complex than simple descriptive statistics. If correlational analysis is used, it is important to remember that correlation between two variables does not prove causation. The direction of influence isn't known, and both may be related to yet a third variable. Multivariate analysis, controlling for other known related variables, is a much stronger analysis than single variable studies.	See references 5 and 11 for examples of multivariate analyses. See Campos-Outcalt et al ⁵ for an example of how to control for national trends when studying time trend data.
Decide on the unit of analysis.	In specialty selection research, the choice is often between the school and the student as the unit of analysis. Each has advantages and disadvantages. When using the school, the number is limited, and small differences may not be detected. Schools with small class sizes can appear to achieve large results by affecting only a few students. However, using the student as a unit of analysis can give undue weight to a few large schools.	Examples of the use of schools as the unit of analysis are references 5,6, and 10, and examples of the use of students as the unit of analysis are references 7, 9, 15,16.

set of 12 recommendations in Table 3, along with examples of studies that have applied them. If they were more widely adopted, these suggestions would significantly improve the quality of research on this important topic.

Conclusions

For specialty choice research to be useful in changing policy and workforce outcomes, it must be planned and conducted diligently with the most robust methodology possible and address important questions. Much of this type of research is performed without external funding and, therefore, with few resources. Nonetheless, the methodology should still be the best possible. We offer this review and advice with the hope of stimulating high-quality research by our junior colleagues. We also hope to encourage editors and reviewers of medical journals and funders of research to use the suggestions to evaluate manuscripts critically and to hold researchers to a high standard. These efforts are important to produce specialty choice research that can assist family medicine to rebound from the last decade

and return to its place as a leading innovative force in US medical education and specialty choice of US students.

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